TOWN OF CHAPEL HILL
Thursday, March 28, 2024 1:00 AM
Town Council
Information Packet

Town Hall
405 Martin Luther King Jr. Boulevard
Chapel Hill, NC 27514
INFORMATION ITEMS ONLY

Mayor Jessica Anderson
Mayor pro tem Amy Ryan
Council Member Camille Berry
Council Member Melissa McCullough
Council Member Paris Miller-Foushee
Council Member Theodore Nollert
Council Member Adam Searing
Council Member Elizabeth Sharp
Council Member Karen Stegman

In-Person Meeting Notification

Changes in Meeting Material content
• We are trying something new to make our Agenda packets clearer and easier to navigate. You'll notice streamlined reports and more hyperlinks to supporting documents.
• We will also produce an "information items" packet periodically, to share items that don't require Council action, but are important to the Council and community. This is the packet for March 2024.

INFORMATION

1. Receive Upcoming Public Hearing Items and Petition Status List. **[24-0174]**

   Attachments: Legal Notices and Scheduled Public Hearings
   Status of Petitions to Council

2. Blue Hill Semiannual Report #19. **[24-0175]**

   Attachments: Staff Report
   Blue Hill Report March 2024
   Blue Hill Development Tracking March 2024
   Blue Hill Debt Scorecard 03.28.2024

3. University of North Carolina at Chapel Hill Semi-Annual Campus Development Report **[24-0176]**

   Attachments: University of North Carolina at Chapel Hill Semi-Annual Report

4. University of North Carolina at Chapel Hill Annual Development Plan Report on Transportation **[24-0177]**

Attachments: 2023 UNC Annual Development Plan Report on Transportation
June 27, 2005, Council Resolution and Guidelines for Annual Development Plan Report on Transportation

TOWN OF CHAPEL HILL

Town Hall
405 Martin Luther King Jr. Boulevard
Chapel Hill, NC 27514

Item Overview

Item #: 1., **File #:** [24-0174], **Version:** 1 **Meeting Date:** 3/28/2024

Receive Upcoming Public Hearing Items and Petition Status List.

Staff:
Sabrina Oliver, Director and Town Clerk
Brenton Hodge, Assistant Town Clerk

Department:
Governance Services

Recommendation(s):

That the Council accept the reports as presented.

Background:
Two pages on our website have been created to track:

- public hearings scheduled for upcoming Council meetings; and
- petitions received, including their status and who you can call for information.

The goal is to provide, in easily available spaces, information that allows people to know when Council will be seeking their comments on a particular topic of development and to know the status of a petition submitted at Council meetings.

In addition to being on the website, these pages will be included in each agenda for Council information,

Fiscal Impact/Resources: Staff time was allocated to create the semi-automated web pages, and additional staff time will be needed for maintenance.

Attachments:

- Legal Notices and Scheduled Public Hearings <https://www.townofchapelhill.org/government/mayor-and-council/legal-notices>
- Status of Petitions to Council <https://www.townofchapelhill.org/government/mayor-and-council/how-to-submit-a-petition/petition-status>

The Agenda will reflect the text below and/or the motion text will be used during the meeting.

By accepting the report, the Council acknowledges receipt of the Scheduled Public Hearings and Status of Petitions to Council lists.

LEGAL NOTICES AND SCHEDULED PUBLIC HEARINGS

The below referenced legal notices are on file with the Town Clerk at Chapel Hill Town Hall, 405 Martin Luther King Jr. Blvd. Written comments may be submitted to the Mayor and Town Council (see "Contact Us"). Residents are invited to give input at public hearings and forums. Those with difficulty hearing or speaking may arrange assistance from an interpreter by calling 919-968-2743 a week prior to the meeting. Also listed are public hearings scheduled for a *specific Council meeting date*, although periodically, some may be continued to a future date. Public hearings may relate to the Land Use Management Ordinance (LUMO), Residential or Commercial Development, Budget, Transportation, or Housing issues. Meeting materials are posted at Council Meeting Agendas, Minutes and Videos.

Interested in a development project not yet scheduled for Council review? See the Development Activity Report for the project's current status.

Visit www.townofchapelhill.org/councilagenda for council meeting agendas.

April 17, 2024

AURA CHAPEL HILL, 1000 MARTIN LUTHER KING JR. BLVD MODIFYING THE PREVIOUSLY APPROVED OFFICE/INSTITUTIONAL–3–CONDITIONAL ZONING DISTRICT (PROJECT #MOD-23-9)

Trinsic Residential Group have applied to modify the previously approved Office/Institutional-3-Conditional Zoning District (OI-3-CZD) at 1000 Martin Luther King Jr. Blvd. to accommodate revised lighting plans and request a modification to regulations to increase the maximum offsite illumination standard from 0.3 foot-candles to 1.3 foot-candles along a section of the northern property boundary. The site consists of one parcel. The parcel is identified as Orange County Parcel Identifier Number: 9789-35-9617. The site is currently zoned Office/Institutional-3-Conditional Zoning District (OI-3-CZD). The proposed zoning district is Office/Institutional-3-Conditional Zoning District (OI-3-CZD). For more information, please visit http://chplan.us/AuraCZ or contact Planning at planning@townofchapehill.org or 919-968-2728.

April 24, 2024

Public Forum

2024-2025 Community Development Block Grant Program Plan

The federal Community Development Block Grant (CDBG) Program, operated by the US Department of Housing and Urban Development (HUD), provides communities with resources to address a wide range of community needs to serve low to moderate income residents. The Town of Chapel Hill has received CDBG funds since 1975 and has used these funds to support a variety of affordable housing initiatives and community service programs.

The Chapel Hill Town Council held an initial public forum on November 15, 2023 and will hold a second public forum in person during the Council Business Meeting on Wednesday April 24, 2024 at 6:00pm to receive resident input on the Town's 2024-2025 CDBG program.

The public is also invited to review and comment on the draft 2024-2025 CDBG Annual Plan, which will be made available online for a period of no less than thirty (30) days beginning April 1, 2024, at:

- www.townofchapelhill.org/cdbg

Please submit all written comments by Tuesday, April 30, 2024. Written comments may be submitted by:

- Mail to Emily Holt, Affordable Housing Manager, Affordable Housing and Community Connections, 405 Martin Luther King Jr. Blvd., Chapel Hill, NC 27514; or
- Email to CDBG@TownofChapelHill.org.

All comments will be incorporated into the final 2024-2025 Annual Plan document submitted to HUD.

Este aviso está disponible en español o en otro idioma bajo petición. Por favor, contacte a Sara Vinas al teléfono 919-969-5079 o dirección: 405 Martin Luther King Jr. Blvd. Chapel Hill, NC 27514.

May 01, 2024

The Chapel Hill Town Council will meet at 6:00 p.m., Wednesday, May 1, 2024, in the Council Chamber of Chapel Hill Town Hall, 405 Martin Luther King Jr. Blvd., to consider an agenda that includes the following:

OPEN A LEGISLATIVE HEARING TO CONSIDER LAND USE MANAGEMENT ORDINANCE TEXT AMENDMENTs TO THE STORMWATER MANAGEMENT REQUIREMENTS.

The Chapel Hill Town Council will open a legislative hearing to receive public comment and provide comments on the proposed text amendments. The proposed text amendments to the Land Use Management Ordinance will clarify the water quality volume required to be treated and add the 100-year, 24-hour storm event to the peak runoff rate control design storms by amending Subsection 5.4.6. General Performance Criteria for Stormwater Management.

Written comments may be submitted to the Mayor and Town Council by email at:

mayorandcouncil@townofchapelhill.org

or addressed to:
Mayor and Town Council
Town of Chapel Hill
405 Martin Luther King, Jr. Blvd
Chapel Hill, NC 27514

For more information, contact Sue Burke at sburke@townofchapelhill.org or 919-969-7266 or visit the website at: https://www.townofchapelhill.org/government/departments-services/public-works/stormwater-management/construction-stormwater-regulations/proposed-lumo-amendments-stormwater-quality-and-peak-flow-rate-requirements

STATUS OF PETITIONS TO COUNCIL

Petitions submitted during the Town Council meetings are added to the list below, typically within five business days of the meeting date.

To contact the department responsible, click on the department name. Meeting materials are posted on the Council Meetings calendar.

Public Initiated | **Council Initiated** | **LUMO** | **Closed**

Meeting Date	Petitioner	Petition Request	Departments Responsible	Petition Status	Modified
03/06/2024	Anne Hartley	Request Addressing Clark Lake Dam's Exclusion from Clark Lake Basin Study.	Public Works Lance Norris, Public Works Director Phone: 919-969-5100 Stormwater	This matter was received and filed.	03/25/2024
03/06/2024	Juliet Alegria	Request for Downtown Bathrooms.	Public Works Lance Norris, Public Works Director Phone: 919-969-5100	This matter was received and referred to the Manager and Mayor.	03/25/2024
03/06/2024	Joyce Sandy	Request The Town of Chapel Hill to remove and replace street signs bearing names linked to the vestiges of racism and oppression that are inconsistent with Town's current goals to be a vibrant and inclusive community.	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707	This matter was received and referred to the Manager and Mayor.	03/25/2024
03/06/2024	George Barrett	Request for Affordable Housing Bond.	Housing & Community	This matter was received and referred to the Manager and Mayor.	03/25/2024
01/24/2024	Samantha Luu	Request for a Social Host Ordinance.	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707	The Council received and referred this request to the Mayor and Town Manager for consideration.	02/01/2024
01/24/2024	Steve Moore	Request Regarding Urgent Cemetery Issues.	Parks & Recreation Atuya Cornwell, Parks and Recreation Director Phone: 919-968-2849	The Council received and referred this request to the Mayor and Town Manager for consideration.	02/01/2024
10/25/2023	Laurie Smith	Requests 4-way Stop at the Intersection of Crofton Springs, Ivy Brook and Cobble Ridge.	Public Works Lance Norris, Public Works Director Phone: 919-969-5100	Staff is preparing information to respond to this request.	11/03/2023

Meeting Date	Petitioner	Petition Request	Departments Responsible	Petition Status	Modified
06/21/2023	Jon Mitchell (Planning Commission)	Request Regarding Parking Policy.	Planning & Development Services	The Council received and referred this request to the Mayor and Town Manager for consideration.	08/21/2023
06/21/2023	John Weis (CDC)	Requests Affordable Program for Blue Hill District.	Housing & Community	The Council received and referred this request to the Mayor and Town Manager for follow-up.	10/23/2023
06/07/2023	Ed Burke	Request to Involve Entire Community In Managing "Housing Pipeline".	Housing & Community	Staff is preparing information to respond to this request.	08/18/2023
05/10/2023	Olivia Ludington	Request Regarding Eno-New hope Landscape Conservation Group.	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707	Staff is following up on the request.	06/01/2023
04/19/2023	Transportation and Connectivity Advisory Board	Request for Support Regarding GoTriangle CRX Bus Route Changes.	Transit Brian Litchfield, Transit Director Phone: 919-969-4908	Staff is preparing information to respond to this request.	06/01/2023
03/22/2023	Yaniv Cohen	Request for Home Occupation Permit Modification.	Planning & Development Services	Staff is preparing information to respond to this request.	04/10/2023
02/15/2023	Cultural Arts Commission	Request for Name, Membership and Charge Changes.	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707 Communications & Public Affairs	Staff will coordinate with the Council Committee on Boards and Commissions to respond to this request.	03/06/2023
01/25/2023	Will Raymond	Request for Ethics Guidelines	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707	The Council received and referred this request to the Mayor and Town Manager for consideration.	02/13/2023
12/07/2022	Carol Conway	Request Regarding Affordable Housing Needs for IDD Members.	Housing & Community	The Council received and referred this request to the Mayor and Town Manager for follow-up. Town staff are able to share how these needs are considered in affordable housing development.	10/05/2023
10/12/2022	Lisa Ostrom	Request to Add an Informational Sign to the Dixie Ln and Rd Signs.	Public Works Lance Norris, Public Works Director Phone: 919-969-5100	Petitioner has been provided information regarding this request and is reviewing options.	06/06/2023

Meeting Date	Petitioner	Petition Request	Departments Responsible	Petition Status	Modified
10/12/2022	Elizabeth Onan (CHOCE)	Request for Council Review the Sign Ordinance and the Chapel Hill Transit Authority Policy and Standards to Ascertain They Fully Comply with Federal First Amendment Rights.	Transit Brian Litchfield, Transit Director Phone: 919-969-4908	Town staff have and will continue to draft and implement Town policies and ordinances in consideration of existing laws and continue to consult with the Town Attorney on these actions as needed.	01/02/2024
09/14/2022	Barbara Driscoll and Lynda Haake	Request Regarding Lights Out Chapel Hill	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707	The Council received and referred this request to the Mayor and Town Manager for follow-up.	10/17/2022
05/18/2022	Josh Romero	Recommendation for CPAC Charge_Name Change	Police Celisa Lehew, Police Chief Phone: 919-968-2834	Staff will coordinate with the Council Committee on Boards and Commissions to respond to this request.	08/22/2022
04/27/2022	Moriah Ridge, LLC	Request to Amend Consent Judgement to Permit the City of Durham to Annex a Property off of Mt. Moriah Road.	Business Management Amy Oland, Business Management Director Phone: 919-969-5017	The Council is scheduled to have a discussion related to this request at their 04/26/2023 meeting.	01/02/2024
11/17/2021	Will Raymond	Request Regarding Ethical Rules Guiding Council, Staff and Advisory Board Conduct.	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707 Mayor Jeanne Brown, Assistant to the Mayor Phone: 919-968-2714	The Council Committee on Boards & Commissions discussed this at their 06/27/22 meeting and will share their recommendations for Council consideration at an upcoming meeting.	08/22/2022
10/13/2021	Tara Kachgal	Request Regarding 110 Jay Street.	Housing & Community	Staff continues to work with legal experts to adhere to all relevant statutes. The Council opened a legislative hearing for a conditional zoning application on 03/23/22 and approved the application on 04/27/22.	01/20/2023
10/13/2021	Savannah Bowers	Request Regarding Operational Transparency for Town Government	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707 Council Committee on Boards and Commissions	The Council Committee on Boards & Commissions discussed this at their 06/27/22 meeting and will share their recommendations for Council consideration at an upcoming meeting.	06/01/2023

Meeting Date	Petitioner	Petition Request	Departments Responsible	Petition Status	Modified
09/22/2021	Barry Nakell	Request to Rename Dixie Lane	Public Works Lance Norris, Public Works Director Phone: 919-969-5100	The Council Naming Committee will review this request and make a recommendation to the Council for consideration.	08/22/2022
09/22/2021	Kate Sayre	Request To Build A Splash Pad in Chapel Hill	Parks & Recreation Atuya Cornwell, Parks and Recreation Director Phone: 919-968-2849	The Council discussed this at their 10/20/2021 work session. Staff will continue to evaluate locations, specifications, and costs for further Council consideration. UPDATE 1/20/23 discussions continue on this idea. Petitioner is engaged in the process.	01/20/2023
09/22/2021	Joan Rehm and Karin Nelson	Request Regarding Downtown Exhaust Noise.	Police Celisa Lehew, Police Chief Phone: 919-968-2834	Staff has been actively engaged with residents on this issue and will continue to do so.	01/20/2023
09/01/2021	Joe Patterson	Request for Modifications to the Town of Chapel Hill Noise Control Code.	Police Celisa Lehew, Police Chief Phone: 919-968-2834	Staff is preparing information to respond to this request.	08/22/2022
06/16/2021	Robert Beasley	Request Regarding Proposed Jay Street Apartments and Affordable Housing Development on Public Land Planning Process.	Housing & Community	Staff continues to work with legal experts to adhere to all relevant statutes. The Council opened a legislative hearing for a conditional zoning application on 03/23/22 and approved the application on 04/27/22.	11/18/2022
06/09/2021	Robert Beasley	Request Regarding Jay Street Land Tract Development Project Funding.	Housing & Community	110 Jay Street was one of five parcels purchased in 2005 with open space bond funding. Town Attorneys and outside counsel have advised there is no legal conflict with repurposing the site for affordable housing after this purchase.	08/22/2022
06/09/2021	Deborah Fulghieri	Request that Town Staff Bring Forward Historical and Environmental Information for the Town-Owned Property at Mt. Carmel Church Road and Bennett Road.	Housing & Community	The Town used open space bond funds to pay closing costs for the land donation. There is no legal conflict with considering alternate uses of a site the Town acquired in this way. Council prioritized the parcel for affordable housing in September 2019.	08/22/2022
05/19/2021	Chapel Hill Public Library Advisory Board	Request for a Working Group on Equitable Library Funding.	Mayor Jeanne Brown, Assistant to the Mayor Phone: 919-968-2714 Library	Orange County established a Library Services Task Force with staff and elected officials from both agencies participating. The task force first met in January 2022 and is continuing to meet regularly.	01/20/2023

Meeting Date	Petitioner	Petition Request	Departments Responsible	Petition Status	Modified
			Meeghan Rosen, Interim Library Director Phone: 919-969-2046 Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707		
05/19/2021	Phil Post	Request to Refer the April 21 Petition Related to 160D to the Planning Commission.	Planning & Development Services	Staff has reviewed this request and recommends no change to the ordinance language at this time. There will be an opportunity to revisit this as part of the Town's LUMO rewrite.	06/01/2023
11/04/2020	Residents in the area of Mason Farm Rd., Whitehead Circle, and Purefoy Rd	Request Improvements to Neighborhood Infrastructure to Promote Safe Walking and Biking and Improved Connectivity to Adjacent Neighborhoods and Campus.	Planning & Development Services Public Works Lance Norris, Public Works Director Phone: 919-969-5100	Staff is preparing information to respond to this request.	08/22/2022
06/10/2020	Community Design Commission	Request to Create a Downtown Design District.	Planning & Development Services	The Town's partnership with UNC on the Downtown Together initiative will help inform the future of downtown development and the role that design standards may have in achieving Downtown Together objectives.	08/22/2022
02/19/2020	Steve Moore	Request Regarding Cemetery Needs.	Parks & Recreation Atuya Cornwell, Parks and Recreation Director Phone: 919-968-2849 Communications & Public Affairs	Staff is in contact with the petitioner and is working to respond to the items raised in the petition. The driveways in Old Chapel Hill Cemetery were resurfaced in July 2021.	08/22/2022
01/08/2020	Renuka Soll	Request for an Improved Petition Process.	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707	The petiton page has been redesigned to provide additional information and context for petitions. Petitioners can contact the Manager's office or the supporting department if they have additional questions.	01/20/2023
06/26/2019	Julie McClintock	Request Regarding the Blue Hill Form Based Code.	Planning & Development Services	The Council and staff continue to evaluate and update the Blue Hill Form Based Code.	08/22/2022

Meeting Date	Petitioner	Petition Request	Departments Responsible	Petition Status	Modified
04/24/2019	Board of Adjustment	Request Regarding Neighborhood Conservation District Ordinances.	Planning & Development Services	The Town is currently in the process of updating its Land Use Management Ordinance. This idea is under consideration as a part of this process.	08/22/2022
04/17/2019	Amy Ryan for Planning Commission	Commission Regarding Site Plan Review Process.	Planning & Development Services	Staff will coordinate with the Council Committee on Boards and Commissions to consider this request.	08/22/2022
02/13/2019	Citizens	Request Regarding Coal Use and Coal Ash.	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707	Remediation work is almost complete along the Bolin Creek Trail near the Police Department. UNC is expected to release their Climate Action Plan in 2021, which is expected to address UNC coal use in the future.	08/22/2022
06/13/2018	Mayor Pam Hemminger	Regarding Reviewing Policies, Procedures, and Practices for Development.	Planning & Development Services	A Town web page with TIA exemption requests is available. Staff continues to look for ways to apply the LUMO clearly and consistently for all stakeholders in the development process.	08/22/2022

Last modified on 3/27/2024 3:15:05 AM

STATUS OF PETITIONS TO COUNCIL

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Public Initiated | **Council Initiated** | **LUMO** | **Closed**

Meeting Date	Petitioner	Petition Request	Departments Responsible	Petition Status	Modified
11/29/2023	Pam Hemminger	Request for LUMO Text Amendments Before the Full LUMO Rewrite.	Public Works Lance Norris, Public Works Director Phone: 919-969-5100 Planning & Development Services	The Council will call a hearing to consider amending the Land Use Management Ordinance at an upcoming meeting.	01/10/2024
10/27/2021	Mayor Hemminger and the Chapel Hill Downtown Partnership	Request that the Town Explore Taking Over the Downtown Portion of Franklin Street.	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707 Public Works Lance Norris, Public Works Director Phone: 919-969-5100	After discussion in early 2022, the Town deferred a decision. In November 2022, Council allocated ARPA funds for multiple Downtown projects including a two-part Streetscape Enhancement Mobility Plan. Part One began in March 2023.	02/05/2024
06/28/2021	Council Member Ryan on Behalf of Mayor Hemminger, Council Member Stegman, and Council Member Gu	Request Regarding Stormwater Storage Basin Projects.	Public Works Lance Norris, Public Works Director Phone: 919-969-5100	The Town paused proposed stormwater projects and Council approved the creation of the Booker Creek Working Group in September 2021. The Group met to discuss their final report on 05/22/23. The Council received the report in June 2023.	01/02/2024
06/09/2021	Council Members Parker, Ryan, Huynh, Stegman, and Gu	Request Regarding Comprehensive Review of Stormwater Regulations.	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707 Public Works Lance Norris, Public Works Director Phone: 919-969-5100	The Council discussed this at their 10/20/21 work session. Staff will explore options for partnering with the LUMO rewrite consultant to perform this review.	08/22/2022
05/19/2021	Council Members Stegman and Parker	Request Regarding Tax Equity Fund.	Town Manager Ross Tompkins, Strategic Operations Manager	In Fall 2021, Orange County launched a new Longtime Homebuyer Assistance program to provide	08/22/2022

Meeting Date	Petitioner	Petition Request	Departments Responsible	Petition Status	Modified
			Phone: 919-968-2707	property tax assistance to help people stay in their home. Staff recommends that funding for this program remains at the County level.	
05/05/2021	Mayor pro tem Parker, Council Member Buansi, and Council Member Stegman	Request Regarding Chapel Hill Increasing its Minority and Women Business Enterprise/Disadvantaged Business Enterprise (MWBE/DBE) Contracting Targets.	Business Management Amy Oland, Business Management Director Phone: 919-969-5017 Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707	Based on Council direction, staff will build increased targets into the upcoming work on the East Rosemary Parking Deck project. Staff will continue working to respond to the broader request.	08/22/2022
03/24/2021	Council Member Anderson	Request Regarding Manufactured Home Parks	Town Manager Ross Tompkins, Strategic Operations Manager Phone: 919-968-2707 Housing & Community	At their 04/27/22 meeting, the Council endorsed the County-Wide Manufactured Homes Action Plan.	08/22/2022
03/14/2018	Council Members Anderson, Gu, and Schaevitz	Request Regarding Addressing Blue Hill District Community Interests.	Planning & Development Services	Council enacted ordinance amendments pertaining to stormwater management, affordable housing, and non-residential development, as well as building size, massing, and permeability. Council considered amendments for townhomes and deferred action.	11/28/2022
11/07/2016	Mayor Hemminger	Regarding Parking and Transit Needs in Downtown Area.	Planning & Development Services Police Celisa Lehew, Police Chief Phone: 919-968-2834 Public Works Lance Norris, Public Works Director Phone: 919-969-5100	Recent actions include replacing parking pay stations, implementing Downtown Ambassadors program, and including additional parking with required Wallace Parking Deck repairs. Next steps include parking payments-in-lieu and public/private partnerships.	11/28/2022

Last modified on 3/27/2024 3:15:05 AM

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Public Initiated | **Council Initiated** | **LUMO** | **Closed**

Meeting Date	Petitioner	Petition Request	Departments Responsible	Petition Status	Modified
06/23/2021	Molly McConnell	Request Regarding Amending the LUMO to Allow 30 Feet Buffer from Roadway.	Planning & Development Services	Request was forwarded to the LUMO project team for considering as LUMO is updated	08/22/2022
05/20/2020	Elaine McVey	Request to Amend the Land Use Management Ordinance Related to Deer Fencing.	Planning & Development Services	Staff will work to bring forward a LUMO Text Amendment for Council consideration at a future date.	10/07/2022
09/11/2019	East Franklin Neighborhood Steering Committee & Neighbors	Request Regarding Neighborhood Preservation.	Police Celisa Lehew, Police Chief Phone: 919-968-2834 Planning & Development Services	Staff will continue to work with residents, the University, and other community members on concerns related to student rental housing. This topic will be considered as part of the LUMO rewrite.	08/22/2022
09/19/2018	Julie McClintock of CHALT	Regarding Land Use Intensification.	Planning & Development Services Public Works Lance Norris, Public Works Director Phone: 919-969-5100	On 6/12/2019, Council received a presentation on the Town's Stormwater program. On 12/9/2020 Council adopted the use of FEMA Flood Resiliency Maps. In 2/2021,Council received more info on Stormwater programs LUMO update will consider other ideas.	08/22/2022
06/27/2018	Susanne Kjemtrup / Brian Hageman	Transportation and Connectivity Advisory Board Request for an Electric Vehicle Provision in the Land Use Management Ordinance.	Planning & Development Services	The Town is currently in the process of updating its Land Use Management Ordinance. These ideas are under consideration as a part of this process.	08/22/2022
06/13/2018	Ondrea Austin	CHALT's Request to Revise the Tree Ordinance.	Planning & Development Services	The Town is currently in the process of updating its Land Use Management Ordinance. This idea is under consideration as a part of this process.	08/22/2022

Last modified on 3/27/2024 3:15:05 AM

TOWN OF CHAPEL HILL

Town Hall
405 Martin Luther King Jr. Boulevard
Chapel Hill, NC 27514

Item Overview

Item #: 2., **File #:** [24-0175], **Version:** 1 **Meeting Date:** 3/28/2024

Blue Hill Semiannual Report #19.

Staff:
Britany Waddell, Director
Judy Johnson, Assistant Director
Corey Liles, Planning Manager

Department:
Planning

See Staff Report on next page.

The Agenda will reflect the text below and/or the motion text will be used during the meeting.

By accepting the report, the Council acknowledges receipt of the Blue Hill Semiannual Report.

Blue Hill Semiannual Report #19 – Blue Hill Form District
Staff: Britany Waddell, Judy Johnson, Corey Liles
Date: March 2024

Overview

- The Report provides updates on Blue Hill District activity since the previous update provided on September 29, 2023.[1]
- This is the 19th report for the Blue Hill District that will occur through 2025.

Report Highlights

Town Projects	The Town completed construction of Elliott Road Extension in 2023. There are currently no active capital projects in the District. Other projects completed by the Town include the Booker Creek Basin Park (recreation and flood storage improvement) and intersection improvements along Fordham Blvd.
Development Review	Tarheel Lodging Phase II: • Along Novus Lane adjacent to Tru Hotel • Approx. 283 dwelling units, 42,455 sq. ft. of office space, and associated amenities • Community Design Commission approved the Certificate of Appropriateness in November 2022 • Staff review is in progress (modification to previous permit) Park Apartments Phase II: • Northwest corner of Elliott Road Extension and Bennett Way • Approx. 259 dwelling units, 16,254 sq. ft. of co-working space, and associated amenities • Community Design Commission approved the Certificate of Appropriateness in April 2023 • Staff review is in progress
Construction Activity	*Projects under construction or approved:* Millennium Chapel Hill (University Inn redevelopment) • Southeast corner of Ephesus Church Road and Fordham Blvd • 274 dwelling units and 37,153 sq. ft. of commercial space Aura Blue Hill • South of former University Inn and north of Park Apartments • 301 dwelling units including live/work units • Approved in January 2023. Community Design Commission is reviewing modifications to the Certificate of Appropriateness

[1] https://chapelhill.legistar.com/LegislationDetail.aspx?ID=6367681&GUID=1B8A983D-230F-43C6-823A-118C6774456F

Financial Performance	The completion of projects continues to increase property tax revenue in the District. Cumulative revenue through FY24 will exceed cumulative debt service payments by an estimated $1,165,595. Annual revenue will continue to exceed debt service in upcoming years.

Attachments

1. Blue Hill District Report, March 2024
2. Development Tracking Spreadsheet, March 2024
3. District Debt Scorecard, March 2024

Blue Hill District Report

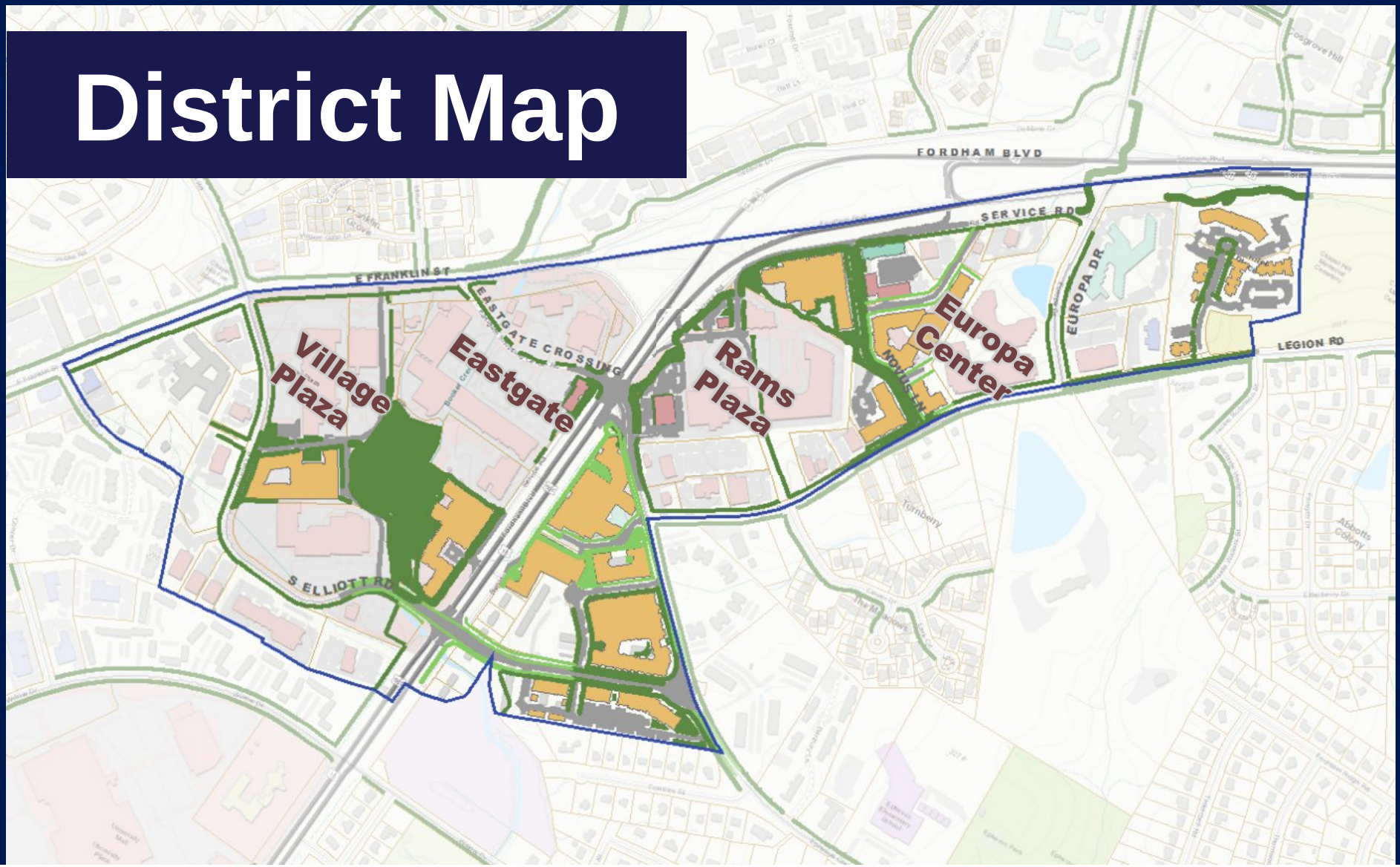
Date: March 2024







District Map





Overview

I. District Performance

II. Recent Activity

III. Looking Ahead

1 District Performance

1 Development Tracking

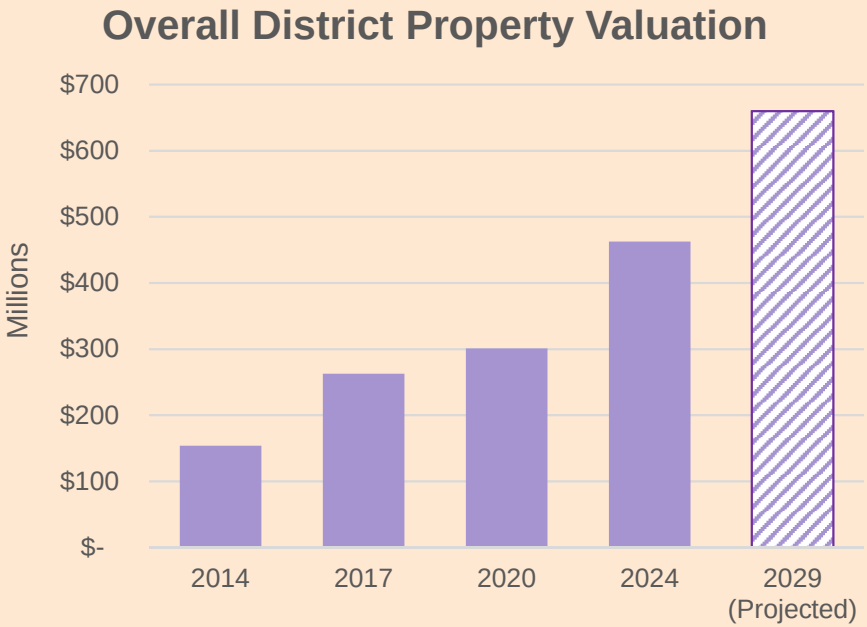
1,805 dwelling units built or in the pipeline (net total)



39,121 sq ft of commercial space built or in the pipeline (net total)



Total tax value of all properties in the District roughly doubled from 2014-2020



1 Development Tracking – Residential

Status as of March 2024

RESIDENTIAL UNITS	NET NEW
Completed Projects	
1,429	1,231
Under Construction	
575	574
Add'l Anticipated* through 2029	
542	542
TOTAL through 2029	
2,546	2,347



* Includes Park Apts Ph 2, Tarheel Lodging Ph II

More details in *Development Tracking Spreadsheet*

1 Development Tracking – Residential

Status as of March 2024

RESIDENTIAL SQUARE FOOTAGE	NET NEW
Completed Projects	
1,702,784	1,556,132
Under Construction	
569,555	566,655
Add'l Anticipated* through 2029	
595,132	595,132
TOTAL through 2029	
2,867,471	2,717,919



* Includes Park Apts Ph 2, Tarheel Lodging Ph II

More details in *Development Tracking Spreadsheet*

1 Development Tracking – Commercial

Status as of March 2024

COMMERCIAL SQUARE FOOTAGE	NET NEW
Completed Projects	
82,114	47,018
Under Construction	
70,273	-7,897
Add'l Anticipated* through 2029	
58,709	17,957
TOTAL through 2029	
211,096	57,078



* Includes Park Apts Ph 2, Tarheel Lodging Ph II. Any new projects will be added here once concept drawings are put forward

More details in *Development Tracking Spreadsheet*

1 Debt Scorecard

Crossing the $1M mark for *cumulative* revenue minus debt payments

- Estimated property tax revenues from completed and under construction projects
- Debt payments on completed road improvements and Elliott Rd Extension

	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Revenues					
Incremental Property Tax	**1,078,366**	**1,185,662**	**1,314,538**	**1,918,176**	**2,167,528**
Expenditures					
Debt Service Payments	**612,794**	**919,500**	**905,435**	**892,283**	**877,748**
Revenue less Debt Service	**465,572**	**266,162**	**409,103**	**1,025,893**	**1,289,780**
Revenue less Debt Service *Cumulative*	**490,330**	**756,492**	**1,165,595**	**2,191,488**	**3,481,268**

More details in *District Debt Scorecard*

2 Recent Activity

2 Town Projects

Completed

- Elliott Road Extension
- Booker Creek Basin Park
- Fordham Intersection Improvements

No Active Capital Projects



2 Development Highlights

Millennium Chapel Hill and **Aura Blue Hill** under construction



Millennium Chapel Hill (formerly University Inn)

Use	Apartments + Lodging
Dwelling Units	274 units
Commercial	37,153 sq ft
Status	Construction



View of site from east



Future illustrative view along Ephesus Church Rd

Aura Blue Hill	
Use	Apartments + Live/Work
Dwelling Units	301 units
Commercial	33,120 sq ft
Status	Building Permits; CDC review of Modifications



Existing development
View from west



Future illustrative
view from south

3 Looking Ahead

3 Proposed Development

Tarheel Lodging Ph2 approved by CDC, under staff review

Park Apartments Ph2 (multifamily + coworking) approved by CDC, under staff review



Next Steps

- Next Blue Hill Update:
  Fall 2024

Blue Hill Development -- Original 2014 Projections

Source: Town of Chapel Hill Economic Development Office
Note: Projections based on local market conditions, long-term leases and the known interests of property owners
Projects assigned to phases based on year of anticipated completion and addition to tax roll

Projected Development, Years 0-4 (2014-2018)				
Project Name	Other Name	Property Type	Projected Residential Units	Projected Square Footage
Quality Inn	Tarheel Lodging/TRU	Hotel	0	200,000
The Park		Residential	775	680,000
The Park (comm site)		Retail	0	7,000
Former Theater	Berkshire	Residential	225	240,000
Former Theater	Berkshire	Retail	0	10,000
Ram's Plaza/CVS	Outparcel & CVS	Retail	0	13,000
			1,000	1,150,000

Projected Development, Years 4-10 (2018-2024)				
Project Name	Other Name	Property Type	Projected Residential Units	Projected Square Footage
University Inn		Hotel	0	100,000
		Retail	0	13,000
Regency Center	Old BBQ Restaurant	Retail	0	4,000
DHIC	Greenfield Place	Residential	101	80,550
			101	197,550

Projected Development, Years 10-15 (2024-2029)				
Project Name	Other Name	Property Type	Projected Residential Units	Projected Square Footage
Eastgate		Retail	0	20,000
		Office	0	75,000
		Residential	225	200,000
Ram's Plaza		Retail	0	300,000
		Office	0	75,000
		Residential	120	100,000
Volvo Dealership	Hillstone	Retail	0	100,000
			345	870,000

Total Projected Development, Years 0-15 (2014-2029)		
	Projected Residential Units	Projected Square Footage
	1,446	2,217,550
Total Office		150,000
Total Retail		467,000
Total Hotel		300,000
Total Residential		1,300,550

Note: 2014 projections also informed by 2011 TIA, which was informed by market analysis associated with Small Area Plan

Blue Hill Development -- Actual to Date

March 2024

Source: Town of Chapel Hill Planning Department, Approved Applications

Note: Projects include those built, under construction and permitted; numbers based on permitted amounts

Actual Development, Years 0-4 (2014 - 2018)

Project Name	Other Name	Property Type	Status	Projection	Residential Units	Net New Residential Units	Square Footage	Net New Square Footage
Ram's Plaza Outbuilding		Retail	Complete	Years 0-4	0	0	2,700	2,700
Former Theater	Berkshire	Residential	Complete	Years 0-4	266	266	307,000	307,000
Former Theater	Berkshire	Retail	Complete	Years 0-4	0	0	15,600	**11,539**
CVS		Retail	Complete	Years 0-4	0	0	13,013	13,013
Eastgate Building D	Former BP	Retail	Complete	*Not projected*	0	0	7,761	**6,109**
DHIC	Greenfield Place	Residential	Complete	Years 4-10	80	80	81,599	81,599
DHIC	Greenfield Commons	Residential	Complete	Years 4-10	69	69	77,775	77,775
					415	415	505,448	499,735

Note: Net New Square Footage reflects demolition of the Old BBQ Restaurant (4,061) and the Former BP Gas Station (1,652)

Actual Development, Years 4-10 (2018 - 2024)

Project Name	Other Name	Property Type	Status	Projection	Residential Units	Net New Residential Units	Square Footage	Net New Square Footage
Trilogy	Hillstone / Former Volv	Residential	Complete	Years 10-15	328	328	400,411	400,411
Bell Chapel Hill	The Elliott / Fordham B	Residential	Complete	*Not projected*	272	272	291,015	291,015
Bell Chapel Hill	Former Days Inn	Hotel	Demolished	*Not projected*	0	0	0	**-23,418**
Tru Hotel	Tarheel Lodging	Hotel	Complete	Years 0-4	0	0	43,040	**37,075**
Hartley	Park Apartments Ph I	Residential	Complete	Years 0-4	414	216	544,984	**398,332**
Millennium Chapel Hill	University Inn	Lodging	Under construction	Years 4-10	0	0	37,153	**-26,139**
Millennium Chapel Hill	University Inn	Residential	Under construction	*Not Projected*	274	274	282,245	**282,245**
Aura Blue Hill		Residential	Approved	*Not Projected*	301	300	287,310	**284,410**
Aura Blue Hill		Commercial	Approved	*Not Projected*	0	0	33,120	**18,242**
					1,589	1,390	1,919,278	1,662,173

Note: Net Units and Net Square Footage reflects demolition of Hong Kong Buffet (5,965), Colony Apartments (146,652), University Inn (63,292), and other commercial buildings

Blue Hill Development -- Anticipated by 2029

March 2024

Source: Town of Chapel Hill Planning Department

Note: Projects include those in pre-application or conceptual phases; numbers are preliminary estimates and subject to change

Anticipated Development, Years 4-15 (2018 - 2029)							
Project Name	Other Name	Property Type	Original Projection	Anticipated Residential Units	Net Anticipated Residential Units	Anticipated Square Footage	Anticipated Net Square Footage
The Park Ph II	Park Apartments Ph II	Residential	Years 0-4	259	259	255,681	255,681
The Park Ph II		Office	Years 0-4	0	0	16,254	16,254
Tarheel Lodging		Residential	*Not Projected*	283	283	339,451	339,451
Tarheel Lodging		Office	*Not Projected*	0	0	42,455	**1,703**
				542	542	653,841	613,089

Note: Net Units and Net Square Footage reflects future demolition of Quality Inn

Redevelopment of Eastgate and Ram's Plaza were included in the 2014 Projections, but these projects are not yet in the pre-application or conceptual phases
Other sites may redevelop in Years 8-15 that are not yet considered 'Anticipated'

Ephesus Fordham District - Score Card

	FY2015-16	FY2016-17	FY2017-18	FY2018-19	FY2019-20	FY2020-21	FY2021-22	FY2022-23	FY2023-24	FY2024-25	FY2025-26	FY2026-27	FY2027-28	FY2028-29	FY2029-30	FY2030-31
Revenues																
Incremental Property Tax	$ -	$ -	$ 499,190	$ 510,089	$ 572,946	$ 616,236	$ 1,078,366	$ 1,185,662	$ 1,314,538	$ 1,918,176	$ 2,167,528	$ 2,167,528	$ 2,167,528	$ 2,167,528	$ 2,167,528	$ 2,167,528
Expenditures																
Debt Service Payments	$ -	$ 434,941	$ 435,224	$ 434,429	$ 434,572	$ 434,537	$ 612,794	$ 919,500	$ 905,435	$ 892,283	$ 877,748	$ 864,219	$ 850,487	$ 841,429	$ 822,168	$ 813,794
Revenue less Expenditures	$ -	$ (434,941)	$ 63,966	$ 75,660	$ 138,374	$ 181,699	$ 465,572	$ 266,162	$ 409,103	$ 1,025,893	$ 1,289,780	$ 1,303,309	$ 1,317,041	$ 1,326,099	$ 1,345,360	$ 1,353,734
Revenue less Expenditures Cumulative	$ -	$ (434,941)	$ (370,975)	$ (295,315)	$ (156,941)	$ 24,758	$ 490,330	$ 756,492	$ 1,165,595	$ 2,191,488	$ 3,481,268	$ 4,784,577	$ 6,101,618	$ 7,427,717	$ 8,773,077	$ 10,126,811

Note:

Debt issued in FY 2017 for Phase I was $5.679 million and in FY 2021 for Phase II was $6.48 million

Incremental property taxes are based on the aggregate change in the valuation of the district since its establishment in 2014

Incremental tax revenue is recognized beginning in FY18 when the first new developments were completed

Incremental Transit tax will remain in the Transit Fund and will not be used for debt service

Tax Increment Calculation	FY2015-16	FY2016-17	FY2017-18	FY2018-19	FY2019-20	FY2020-21	FY2021-22	FY2022-23	FY2023-24	FY2024-25	FY2025-26	FY2026-27	FY2027-28	FY2028-29	FY2029-30	FY2030-31
General Fund 37.6 cents FY18; 38.6 FY19-21; 37.2 FY22-23; 42.2 FY24+	-	-	$ 409,815	$ 420,715	$ 456,937	$ 491,461	$ 872,070	$ 958,840	$ 1,087,716	$ 1,587,197	$ 1,793,523	$ 1,793,523	$ 1,793,523	$ 1,793,523	$ 1,793,523	$ 1,793,523
Debt Fund 8.2 cents FY18-19; 9.8 FY20-21; 8.8 FY22+	-	-	89,375	89,375	116,010	124,775	206,296	226,822	226,822	330,979	374,005	374,005	374,005	374,005	374,005	374,005
Total	$ -	$ -	$ 499,190	$ 510,089	$ 572,946	$ 616,236	$ 1,078,366	$ 1,185,662	$ 1,314,538	$ 1,918,176	$ 2,167,528	$ 2,167,528	$ 2,167,528	$ 2,167,528	$ 2,167,528	$ 2,167,528
Transit Fund 5.0 cents FY17-18; 6.0 FY19-21; 5.4 FY22; 6.2 FY23+	$ -	$ -	$ 54,497	$ 65,396	$ 71,026	$ 76,393	$ 126,591	$ 159,807	$ 159,807	$ 233,190	$ 263,503	$ 263,503	$ 263,503	$ 263,503	$ 263,503	$ 263,503

Calculation of Incremental Increase in District Value	FY2017-18**	FY2018-19	FY2019-20	FY2020-21	FY2021-22**	FY2022-23	FY2023-24	FY2024-25	FY2025-26	FY2026-27	FY2027-28	FY2028-29	FY2029-30	FY2030-31
Ef District Valuation January 2014	$ 154,002,930	$ 154,002,930	$ 154,002,930	$ 154,002,930	$ 154,002,930	$ 154,002,930	$ 154,002,930	$ 154,002,930	$ 154,002,930	$ 154,002,930	$ 154,002,930	$ 154,002,930	$ 154,002,930	$ 154,002,930
Ef District Valuation January 20xx	262,996,401	262,996,401	272,380,286	281,324,411	388,430,401	411,755,501	411,755,501	530,115,903	579,008,403	579,008,403	579,008,403	579,008,403	579,008,403	579,008,403
Incremental Value Increase	$ 108,993,471	$ 108,993,471	$ 118,377,356	$ 127,321,481	$ 234,427,471	$ 257,752,571	$ 257,752,571	$ 376,112,973	$ 425,005,473	$ 425,005,473	$ 425,005,473	$ 425,005,473	$ 425,005,473	$ 425,005,473

Development Projects*	Status	Sq Ft Resid.	Sq Ft Comm.	Original Valuation	Revaluation	Completion
Village Plaza Apartments (Alexan)(Berkshire)	Occupied	305,000	$ 15,600	$ 61,604,500	$ 80,124,700	FY18
CVS at Rams Plaza	Occupied	-	10,461	532,000	570,000	FY18
Eastgate Building D	Occupied	-	7,761	776,100	1,130,600	FY18
Rams Outparcel	Occupied	-	2,700	692,900	767,000	FY18
Greenfield Place (Tax Exempt)	Occupied	81,599	-	9,383,885	-	FY19
Greenfield Commons (Tax Exempt)	Occupied	77,775	-	8,944,125	-	FY20
Trilogy Apartments (Hillstone Chapel Hill)	Occupied	400,411	-	58,201,200	62,232,100	FY20
Bell Chapel Hill (The Elliott)(Fordham Blvd Apartments)	Occupied	291,015	-	42,197,175	44,215,100	FY20
Quality Inn Redevelopment Phase I (TRU hotel)	Occupied	-	43,040	4,700,000	4,273,600	FY22
Quality Inn Redevelopment Phase II (office & residential)****	Under Review	339,451	42,455	-	-	FY26
The Hartley at Blue Hill (Park Apartments Phase IB)	Occupied	143,935	-	-	19,051,500	FY22
The Hartley at Blue Hill (Park Apartments Phase IA)	Occupied	401,049	-	70,924,667	59,139,400	FY24
The Park Apartments Redevelopment (Phase II)****	Under Review	268,835	16,254	-	-	FY26
Millennium Chapel Hill Apartments (University Inn Redevelop)***	Construction	282,245	37,153	-	59,221,002	FY24
Aura Blue Hill***	Construction	287,310	33,120		48,892,500	FY25
Total		2,878,625	208,544	$ 257,956,552	$ 379,617,502	

TOWN OF CHAPEL HILL

Town Hall
405 Martin Luther King Jr. Boulevard
Chapel Hill, NC 27514

Item Overview

Item #: 3., **File #:** [24-0176], **Version:** 2 **Meeting Date:** 3/28/2024

University of North Carolina at Chapel Hill Semi-Annual Campus Development Report.

Staff:
Britany Waddell, Director
Judy Johnson, Assistant Director
Corey Liles, Planning Manager
Tas Lagoo, Principal Planner
Anna Scott Myers, Planner I

Department:
Planning

Overview: In 2005, the Council adopted a resolution requesting semi-annual updates regarding development activity on the UNC-Chapel Hill campus. In September 2023, the Council adopted a resolution discontinuing the presentation of University development projects to the Council. Fall and Spring semi-annual reports will be provided as information items moving forward.

Recommendation:

That the Council receive the report from UNC-Chapel Hill staff on the status of current and planned campus projects.

Attachments:

- University of North Carolina at Chapel Hill Semi-Annual Report

The Agenda will reflect the text below and/or the motion text will be used during the meeting.

By accepting this report, the Council acknowledges receipt of the report from UNC-Chapel Hill staff on the status of current and planned campus projects.

LEGEND
R = Renovation
NC = New Construction
P = Planning study

UN = University Non-appropriated
SA = State appropriation
RR = Repair & renovation
SB = State bond
GI = Gifts
COPS = Cert. of Participation Bond
UNCH = UNC Healthcare

PROJECTS COMPLETED SINCE LAST REPORT **Total:** $ 159,455,472

Phase	Type	CIP#	Project Name	Const. Type	Fund Source	Spending Authority	$/SF	Phase Start	Phase Complete
1- Completed	Infrastructure	633	Medical Education Building Replacement	NC	SB	$ 116,269,180	$ 665.99	5/1/2020	7/15/2023
1- Completed	Other	21134	Rosemary Street Innovation Hub - Furniture Design and Procurement	NC	UN	$ 620,265	N/A	6/9/2023	10/29/2023
1- Completed	Athletics	21162	Kenan Football Center Renovations	NC	GI	$ 15,000,000	$ 918.84	3/1/2022	7/15/2023
1- Completed	Auxiliary	368	Craige Deck Expansion partial migration	R	UN	$ 2,400,027	N/A	3/1/2023	8/1/2023
1- Completed	Infrastructure	708	Kenan Labs - Replace Main Distribution Electrical Panel	R	SA/RR	$ 1,750,000	$ 12.46	8/7/2020	7/31/2023
1- Completed	Infrastructure	21013	FOBRL - South Dog Run HVAC Replacement	R	UN	$ 450,000	$ 1,607.14	11/11/2021	9/1/2023
1- Completed	Athletics	21193	Finley Golf Course - Athletics Renovations (Phase I)	R	GI	$ 12,900,000	N/A	10/1/2022	9/6/2023

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PROJECTS IN CONSTRUCTION **Total:** $ 240,961,272

Phase	Type	CIP#	Project Name	Const. Type	Fund Source	Spending Authority	$/SF	Phase Start	Phase Complete
2- Construction	Infrastructure	645	Horace William Airport Property Solar and Energy Storage Demo	NC	UN	$ 1,700,310	N/A	8/1/2019	3/1/2024
2- Construction	Classroom	666	Kenan Flagler School of Business McColl Bldg Addition & Renovation	NC	SA	$ 194,250,000	$ 508.35	2/1/2023	11/10/2025
2- Construction	Infrastructure	653	Taylor Air Flow Reduction Energy Project	R	UN	$ 1,656,951	N/A	10/1/2022	2/15/2024
2- Construction	Infrastructure	654	Thurston Bowles Air Flow Reduction Energy Project	R	UN	$ 2,428,000	N/A	10/1/2022	2/15/2024
2- Construction	Infrastructure	678	Mitchell Hall & Dey Hall - Replace Electrical Switchgear	R	SA/RR	$ 1,228,382	$ 10.03	3/11/2020	12/31/2023
2- Construction	Auxiliary	727	Campus-wide Parking Repairs	R	UN	$ 3,720,000	N/A	3/1/2020	8/15/2024
2- Construction	Auxiliary	744	Parking Access Revenue Control System (PARCS)	R	UN	$ 3,100,000	N/A	8/1/2022	3/31/2024
2- Construction	Infrastructure	749	Campus Central Alarm Network Replacement	R	UN	$ 6,400,000	N/A	6/16/2020	2/28/2024
2- Construction	Athletics	20101	Carmichael & Woolen Gym - Women's Basketball Renovations - Phase III	R	UN	$ 10,750,000	$ 959.82	5/15/2020	6/30/2024
2- Construction	Auxiliary	20102	Dogwood Deck - HVAC Air Quality Improvements for CCTV Offices	R	UN	$ 394,469	N/A	6/21/2023	2/28/2024
2- Construction	Infrastructure	20312	McGavran-Greenberg - Renovation to Containment Space	R	UN	$ 4,950,000	$ 1,414.29	1/4/2021	6/1/2024
2- Construction	Research	21227	Neurosciences - DCM Equipment replacement/rebuild	R	UN	$ 5,500,000	N/A	11/25/2022	1/31/2024
2- Construction	Research	21284	Glaxo - Proteomics Renovation	R	UN	$ 650,000	$ 1,221.80	4/10/2023	1/31/2023
2- Construction	Infrastructure	21328	Rams Head Rec Center Roof & Window Replacement	R	UN	$ 490,000	N/A	7/17/2023	6/30/2024
2- Construction	Infrastructure	21433	Art Studio Building Fire Sprinkler	R	RR	$ 408,175	$ 21.07	6/1/2023	7/1/2024
2- Construction	Infrastructure	21434	Davie Hall & Kenan Center Fire Alarm	R	RR	$ 835,985	N/A	6/1/2023	7/1/2024
2- Construction	Research	23315	Marsico 2nd Floor Lab Fire - Remediation Response and Restoration	R	UN	$ 2,000,000	N/A	5/15/2023	8/1/2023
2- Construction	Research	23318	ITS Manning - School of Data Science & Society	R	UN	$ 499,000	N/A	5/5/2023	3/15/2024

LEGEND

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	UNCH = UNC Healthcare

PROJECTS IN DESIGN **Total:** $ 788,287,975

Phase	Type	CIP#	Project Name	Const. Type	Fund Source	Spending Authority	$/SF	Phase Start	Phase Complete
3- Design	Research	659	Translational Research Building	NC	UN	$ 228,600,000	$ 1,385.45	12/20/2023	9/30/2025
3- Design	Classroom	20350	Carrington Hall Renovations	NC	UN	$ 97,900,000	$ 890.00	12/14/2020	2/2/2024
3- Design	Classroom	21212	Bingham Hall Comprehensive Renovation	NC	SA	$ 18,530,460	$ 617.68	12/15/2021	2/1/2024
3- Design	Other	21393	Porthole Alley Redevelopment	NC	UN	$ 100,000,000	$ 909.09	7/1/2022	5/1/2025
3- Design	Research	21404	FORBL - Large Pig Barn Replacement, unit 3 212C (OLU3)	NC	UN	$ 499,000	$ 998.00	2/1/2023	2/1/2024
3- Design	Infrastructure	21506	Chilled Water Infrastructure Expansion - I/II/III/IV	NC	UN	$ 155,000,000	N/A	9/1/2022	9/1/2024
3- Design	Other	21533	Hazardous Waste Warehouse & Storage Buildings	NC	UN	$ 476,100	N/A	7/1/2022	2/1/2024
3- Design	Auxiliary	23039	Rams Head - Solar Panel	NC	UN	$ 633,728	N/A	3/14/2023	2/28/2024
3- Design	Athletics	23347	Finley Golf Course - Maintenance Building Addition	NC	GI	$ 600,000	$ 300.00	4/21/2023	2/1/2024
3- Design	Auxiliary	23116	Transportation and Parking Systems Five Year Plan	P	UN	$ 380,000	N/A	1/9/2023	6/1/2024
3- Design	Other	24034	ADA Transition Plan - Physical Barrier Assessment	P	UN	$ 499,000	N/A	12/1/2023	12/31/2024
3- Design	Infrastructure	571	Chapman Hall	R	UN	$ 486,767	N/A	12/15/2021	2/1/2024
3- Design	Infrastructure	586	South Building Accessibility Improvements	R	UN	$ 2,300,000	N/A	5/1/2022	2/1/2024
3- Design	Auxiliary	669	UNC Parking Decks - LED Lighting Safety Upgrades	R	UN	$ 450,000	N/A	9/1/2022	3/1/2024
3- Design	Infrastructure	733	Energy Management Controls System Upgrade	R	UN	$ 2,890,500	N/A	1/10/2022	2/1/2024
3- Design	Auxiliary	20100	Avery Residence Hall Renovation	R	UN	$ 32,250,000	N/A	10/13/2022	6/1/2024
3- Design	Auxiliary	20103	House Undergraduate Library Renovation	R	UN	$ 8,500,000	$ 404.76	1/5/2024	5/15/2025
3- Design	Infrastructure	21400	Phillips Hall HVAC Renovation	R	RR	$ 14,800,000	N/A	7/1/2022	12/1/2023
3- Design	Infrastructure	21401	Wilson Library Infrastructure Upgrades	R	RR	$ 31,186,299	N/A	7/1/2022	12/1/2024
3- Design	Other	21405	Kessing Outdoor Pool - Leak Investigation	R	RR	$ 458,000	N/A	7/26/2023	12/31/2023
3- Design	Infrastructure	21427	Carroll Hall & South Building Roof Replacement	R	RR	$ 1,334,062	$ 93.95	12/1/2022	9/1/2023
3- Design	Infrastructure	21430	Davie Hall HVAC Replacement	R	RR	$ 1,523,371	N/A	1/4/2023	10/1/2023
3- Design	Infrastructure	21431	Carroll Hall & Dey Hall Elevator Replacement	R	RR	$ 1,942,782	N/A	12/22/2022	11/1/2023
3- Design	Infrastructure	21432	Coastal Process Environmental Health Lab Building Systems	R	RR	$ 675,000	N/A	1/31/2023	10/1/2023
3- Design	Infrastructure	21503	Elevator Replacement - Brinkhous-Bullit, Hamilton, Lineberger	R	RR	$ 4,843,986	N/A	9/1/2022	12/1/2023
3- Design	Infrastructure	21507	East Cameron Avenue Walkway Resconstruction	R	UN	$ 1,300,000	N/A	9/1/2022	2/1/2023
3- Design	Other	21525	Davis Library - Gender Neutral Restrooms	R	UN	$ 490,000	N/A	-	-
3- Design	Infrastructure	21531	Hamilton Hall HVAC Renovation	R	RR	$ 8,800,000	N/A	-	-
3- Design	Classroom	21537	Caldwell Hall - Accessibility Project	R	UN	$ 1,700,000	N/A	8/8/2022	2/1/2023
3- Design	Auxiliary	21556	Davis Library Café	R	UN	$ 3,000,000	N/A	7/1/2022	9/1/2023
3- Design	Infrastructure	23028	Brinkhous-Bullitt Building Electrical Service & Distribution	R	RR	$ 4,843,986	N/A	2/1/2022	6/1/2025
3- Design	Infrastructure	23040	Carolina Student Union - Elevator Modernization	R	UN	$ 468,504	N/A	8/28/2023	5/13/2024
3- Design	Auxiliary	23075	Student Bookstore - Minute Clinic & Pharmacy Expansion, 3rd Floor	R	UN	$ 416,000	$ 346.67	1/4/2023	7/1/2023
3- Design	Research	23091	Chapman Hall - Renovation of 042A, 046A & 026A into lab space.	R	UN	$ 500,000	N/A	12/1/2022	9/1/2023
3- Design	Auxiliary	23135	Morrison Residence Hall - Elevator Modernization for all three elevators	R	UN	$ 1,700,000	N/A	8/28/2023	11/27/2023
3- Design	Research	23152	Genetic Medicine Building First Floor Lab Renovation	R	UN	$ 4,000,000	$ 1,333.33	2/1/2022	1/1/2024
3- Design	Infrastructure	23161	Neuroscience Heat Exchanger Replacement SCO#25734	R	UN	$ 854,092	N/A	3/1/2023	9/1/2023
3- Design	Infrastructure	23213	Building Envelope Repairs - Tarrson Hall, Alumni Hall, Jackson, Koury Oral	R	RR	$ 1,826,909	N/A	8/28/2023	12/1/2023
3- Design	Infrastructure	23214	Elevator Repairs - Brinkhous-Bullitt, Lineberger CCC	R	RR	$ 1,700,000	N/A	9/1/2023	12/1/2023
3- Design	Infrastructure	23215	EHS Building - Roof Replacement	R	RR	$ 625,000	N/A	9/1/2023	12/1/2023
3- Design	Infrastructure	23217	Campus Life Safety Project, Phase 2 - EMCS	R	RR	$ 1,800,000	N/A	4/20/2023	-
3- Design	Infrastructure	23255	Baity Hill - Replace Rooftop Units	R	UN	$ 3,300,000	N/A	9/1/2023	12/1/2023
3- Design	Other	23276	Campus Landscape Framework Plan	R	UN	$ 500,000	N/A	3/23/2023	6/1/2024
3- Design	Auxiliary	23282	Graham Student Union - AHU Replacement	R	UN	$ 342,529	N/A	3/31/2023	7/31/2023
3- Design	Research	23334	Taylor Hall - RO system Replacement	R	UN	$ 350,000	N/A	4/18/2023	-
3- Design	Infrastructure	23336	Alumni Hall - Envelope Repairs	R	RR	$ 500,000	N/A	5/8/2023	9/4/2023
3- Design	Classroom	23358	Morehead Chemistry Building - Class Lab Renovation	R	SA	$ 3,490,000	$ 513.24	10/15/2023	10/15/2024
3- Design	Infrastructure	23361	Lineberger Airflow Reduction - 1292 Energy Project	R	RR	$ 2,770,000	N/A	5/3/2023	-
3- Design	Infrastructure	23381	Spangler Annex - Fire Alarm Replacement	R	RR	$ 370,900	N/A	5/17/2023	-
3- Design	Infrastructure	23390	AOB - Roof Replacement	R	RR	$ 985,000	N/A	9/1/2023	12/1/2023
3- Design	Infrastructure	23391	Fordham Lab Process - CW System Replacement	R	UN	$ 300,000	N/A	6/1/2023	12/1/2024
3- Design	Infrastructure	23425	Spangler Annex Restoration	R	UN	$ 500,000	N/A	-	-
3- Design	Infrastructure	23451	Graham Memorial Hall - Roofing Repair / Replacement	R	UN	$ 1,500,000	$ 75.00	10/1/2022	-
3- Design	Infrastructure	24008	North Campus Elevator Modernizations	R	RR	$ 2,150,000	N/A	-	-
3- Design	Infrastructure	24015	Academic Affairs Restroom Accessibility Upgrades - Advanced Planning	R	UN	$ 1,250,000	N/A	12/1/2023	6/1/2025
3- Design	Auxiliary	24065	Rams Head - Window Replacement	R	UN	$ 496,000	N/A	-	-

3- Design	Infrastructure	24075	Pit Area Stormwater Improvements	R	UN	$ 1,200,000	N/A	12/1/2023	-
3- Design	Athletics	21194	Cone-Kenfield Tennis Center - Athletics Renovations (Phase II)	R	GI	$ 12,500,000	N/A	12/1/2023	-
3- Design	Athletics	21193	Finley Golf Course - Athletics Renovations (Phase II)	R	GI	$ 15,000,000	N/A	12/1/2023	-

SUMMARY OF MAJOR CAPITAL IMPROVEMENT ACTIVITY:

	Quantity	$ Value
Completed since 7/2023	13	$ 159,455,472
In Construction	18	$ 240,961,272
In Design	59	$ 788,287,975
On Hold	13	$ 86,754,324

HISTORICAL RECORD OF ACTIVITY:

		UNDER CONSTRUCTION		IN DESIGN		ON HOLD	
Year	Month	No. of Projects	Dollar Value	No. of Projects	Dollar Value		
1989	July	20	$ 158,003,370	29	$ 170,550,730		
1990	Jan	18	$ 153,331,770	34	$ 174,785,500		
1990	July	14	$ 161,479,980	29	$ 165,398,600		
1991	Jan	10	$ 191,489,780	26	$ 147,486,500		
1991	July	11	$ 202,564,380	28	$ 132,000,800		
1992	Jan	9	$ 193,656,480	31	$ 123,015,800		
1992	July	16	$ 196,850,380	25	$ 132,470,400		
1993	Jan	15	$ 178,790,400	27	$ 137,062,000		
1993	July	9	$ 91,072,000	21	$ 121,141,100		
1994	Jan	6	$ 90,707,300	33	$ 154,615,300		
1994	July	15	$ 101,999,300	28	$ 147,370,700		
1995	Jan	13	$ 66,320,700	52	$ 175,385,600		
1995	July	14	$ 101,192,800	46	$ 164,311,800		
1996	Jan	11	$ 89,901,800	67	$ 246,980,600		
1996	July	17	$ 92,701,100	61	$ 299,168,300		
1997	Jan	19	$ 131,072,400	63	$ 282,872,700		
1997	July	37	$ 235,425,600	44	$ 223,235,350		
1998	Jan	33	$ 158,837,100	50	$ 278,691,575		
1998	July	36	$ 183,705,300	43	$ 285,946,375		
1999	Jan	26	$ 153,298,200	42	$ 314,955,275		
1999	July	20	$ 175,689,300	44	$ 374,499,175		
2000	Jan	18	$ 173,787,000	38	$ 380,677,875		
2000	July	20	$ 171,732,100	44	$ 402,994,475		
2001	Jan	20	$ 265,311,575	56	$ 255,342,400		
2001	July	30	$ 277,577,875	57	$ 509,245,260		
2002	Jan	28	$ 282,315,475	51	$ 533,569,700		
2002	July	25	$ 297,186,000	51	$ 533,569,700		
2003	Jan	18	$ 246,220,200	52	$ 700,266,390		
2003	July	15	$ 239,095,165	58	$ 677,135,478		
2004	Jan	18	$ 345,073,797	59	$ 607,602,868		
2004	July	24	$ 435,597,765	61	$ 837,011,823		
2005	Jan	32	$ 540,484,649	77	$ 997,282,175		
2005	July	42	$ 604,951,066	62	$ 848,018,466		
2006	Jan	39	$ 606,059,278	50	$ 681,154,808		
2006	July	36	$ 753,387,157	55	$ 697,916,808		
2007	Jan	39	$ 493,513,761	60	$ 729,086,980		
2007	July	38	$ 559,519,076	50	$ 586,321,980		
2008	Jan	29	$ 510,723,322	46	$ 733,693,000		
2008	July	27	$ 570,815,114	51	$ 715,328,000		
2009	Jan	25	$ 429,973,546	47	$ 906,213,000		
2009	July	24	$ 633,089,281	40	$ 577,740,422		
2010	Jan	18	$ 600,252,605	22	$ 409,120,032		
2010	July	18	$ 618,429,022	32	$ 539,620,032		
2011	Jan	15	$ 605,745,206	30	$ 474,190,032		
2011	July	19	$ 802,905,823	28	$ 292,000,000		
2012	Jan	15	$ 742,125,183	28	$ 313,100,000		
2012	July	17	$ 655,508,823	31	$ 309,600,000		
2013	Jan	12	$ 550,585,206	34	$ 389,726,000		
2013	July	10	$ 311,575,000	34	$ 334,449,095		
2014	Jan	9	$ 338,372,095	45	$ 337,177,000		
2014	July	14	$ 349,553,714	42	$ 376,843,592		
2015	Jan	19	$ 377,846,839	50	$ 423,639,550		
2015	July	17	$ 365,166,669	48	$ 304,163,543		
2016	Jan	12	$ 333,622,316	46	$ 324,057,991		
2016	July	29	$ 434,745,367	43	$ 341,359,544		
2017	Jan	18	$ 175,227,717	37	$ 372,416,500		
2017	July	22	$ 266,078,688	32	$ 349,812,207		
2018	Jan	18	$ 274,080,528	29	$ 344,807,071		
2018	July	19	$ 304,079,288	52	$ 310,406,734		
2019	Jan	20	$ 286,371,191	62	$ 346,795,502		
2019	July	23	$ 119,661,515	51	$ 394,369,547		
2020	Jan	34	$ 229,924,428	29	$ 82,968,126	20	$ 193,897,770
2020	July	27	$ 43,307,804	14	$ 227,101,740	21	$ 204,941,389
2022	July	23	$ 215,421,198	34	$ 509,628,364	18	$ 289,061,602
2023	Jan	22	$ 213,773,866	42	$ 613,698,238	12	$ 280,284,566
2023	July	25	$ 379,759,115	54	$ 470,965,408	16	$ 313,584,566
2024	Jan	18	$ 240,961,272	59	$ 788,287,975	13	$ 86,754,324

TOWN OF CHAPEL HILL

Town Hall
405 Martin Luther King Jr. Boulevard
Chapel Hill, NC 27514

Item Overview

Item #: 4., **File #:** [24-0177], **Version:** 1 **Meeting Date:** 3/28/2024

University of North Carolina at Chapel Hill Annual Development Plan Report on Transportation

Staff:
Britany Waddell, Director
Judy Johnson, Assistant Director
Corey Liles, Planning Manager
Tas Lagoo, Principal Planner
Roger Henderson, Transportation Engineering Manager

Department:
Planning

Public Works

Overview: The Development Plan for the main campus of UNC-Chapel Hill requires the University to provide annual reports to Council regarding transportation-related impacts of development on campus.

Recommendation(s):

That the Council receive the report from UNC-Chapel Hill staff regarding transportation-related impacts of development on campus.

Key Issues:

- On June 27, 2005, the Council approved a resolution requesting that the University submit an Annual Development Plan Report on Transportation associated with development in the Office/Institutional-4 (OI-4) zoning district on the University campus. The Council also approved the guidelines for the development of the Report. A copy of the resolution and the guidelines is attached.
- This overview transmits the 2023 report. The Council previously received the reports from 2005 to 2022. The 2023 report includes updated traffic information that could not be gathered in previous years due to the impacts of the COVID-19 pandemic.

Attachments:

- 2023 UNC Annual Development Plan Report on Transportation
- June 27, 2005, Council Resolution and Guidelines for Annual Development Plan Report on Transportation

The Agenda will reflect the text below and/or the motion text will be used during the meeting.

By receiving the report, the Council acknowledges receipt of the Annual Development Plan Report on Transportation report from UNC-Chapel Hill staff.

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The University of North Carolina at Chapel Hill

Development Plan

Transportation Impact Analysis Update

December 2023

The University of North Carolina at Chapel Hill

Development Plan

Transportation Impact Analysis
Update

December 2023

Prepared by

VHB Engineering NC, P.C.

EXECUTIVE SUMMARY

This is the eleventh update of North Carolina at Chapel Hill Development Plan. The updates are being submitted to the Town in accordance with the requirements of the Town of Chapel Hill's Office/Institutional-4 (OI-4) Zoning District regulations. The purpose of this updated analysis is to provide an assessment of the transportation implications of the Development Plan and revise mitigation measures, if needed based on the updated analysis, to address impacts. Transportation elements addressed include automobile traffic, transit, parking, bicycle and pedestrian traffic, and associated air quality issues.

In 2021, an abbreviated traffic analysis was completed due to the impacts of COVID-19 on campus population and activities and published in the Annual Development Plan Report on Transportation. The report included a brief analysis of twelve (12) intersections as directed by staff of the Town of Chapel Hill, while relying heavily on data and analysis completed for the 2019 update to the Transportation Impact Analyses (TIA). Due to the reduced scope in 2021, the data and results presented in this TIA update are compared to the December 2019 update.

Some new data has now been collected for this update to identify trends and refine recommendations where necessary, including traffic, pedestrian and bicyclist volumes, employee and student distributions, and transit ridership data. Projections of future mode splits (i.e., how commuters may be traveling to Campus in 2022) are included in this update based on results of the commuter survey. Due to the COVID-19 pandemic, the 2021 commuter survey was not completed, and the 2023 survey results are still preliminary at the time of this report. Therefore, assumptions for future mode splits are based on the latest full survey, which was completed in 2019.

The Development Plan projects will add approximately 8 million gross square feet (GSF) of new development to Campus, including parking decks and infrastructure. The net increase in new occupied floor area for the Development Plan is approximately 5.6 million square feet, or an estimated 58 percent increase over pre-2001 occupied floor area. Growth projections provided by the University estimate that employee growth is anticipated to be 69 percent (9,871 additional employees) and student growth is anticipated to be 24 percent (5,903 additional students) over the life of the Development Plan, through the year 2022. Updated growth projections will be included in the final version of this report as provided by the University.

The increase in Main Campus employee and student parking accompanying the Development Plan is significantly less than current ratios. Therefore, an increase in the use of alternative modes is an essential component of the Development Plan.

The Development Plan will permanently displace 4,061 existing surface spaces and add 5,640 new spaces to Main Campus. The net parking impact of the proposed Development Plan remains at an increase of 1,579 spaces. Of these, 1,455 are for patients/visitors, 411 are for employees/commuting students, 6 for other users (e.g., service), and there is a net loss of 287 for resident students.

When the growth in employees and students is taken into account, the following Main Campus parking "shortfalls" are projected (approximate numbers) to occur with implementation of the Development Plan (shortfall is defined as the difference between

the amount of Main Campus parking that would be required if parking continued to be provided at pre-Development Plan rates, and the amount that actually will be provided):

- 4,572 employee spaces
- 423 commuting student spaces
- 451 resident student spaces
- 2,100 visitors

The amount of traffic that will be generated by the Development Plan is a function of the amount of parking that will be provided, with the improved alternative modes described in the report serving the other employees and students. An integral element of the adopted Main Campus Master Plan is to minimize the increase in Main Campus parking as Campus grows by promoting and increasing the use of alternative forms of transportation. The parking and transportation initiatives that are inherent in the Development Plan are consistent with the transportation strategy for the Master Plan.

The net increase in parking will generate 11,487 daily vehicular trips. This can be contrasted to the amount of traffic that would be generated by a typical hypothetical development of similar size where no, or very limited, trip reduction strategies apply. Using trip rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual (9th Edition) yields an estimated 34,821 vehicular trips on a typical day. Therefore, the trips associated with the Development Plan are significantly lower compared to a typical development.

An increased proportion of commuters will use alternative means of traveling to Campus. The following alternatives will be improved and/or promoted as part of the University's trip reduction program:

- Chapel Hill Transit (CHT)
- Regional transit
- Park-and-ride
- Ridesharing
- Teleworking
- Cycling
- Walking

Potential future actions include identifying more park-and-ride spaces in the US 15-501 N corridor as needed to serve the Main Campus, continued improvements to CHT, and improvements to regional transit.

Park-and-ride continues to be a popular choice for employees and students, although counts are down as compared to previous years. The Friday Center lot continues to fill, and as in the past, most likely accommodates commuters from the US 15-501 north corridor, which has no park-and-ride options, in addition to commuters from the east. The decrease in park-and-ride as compared to previous years can likely be explained by the introduction of fees for park-and-ride spaces in fall 2013. The currently-estimated net park-and-ride need for the Development Plan (1,338 spaces), has been met with construction of the 871-space Friday Center lot, the 443-space Jones Ferry Road lot, the 278-space Hedrick lot, and the 550-space Chatham lot.

It is important to note that the University has a full-time Transportation Demand Management (TDM) manager. The role of this person is to promote and assist employees in learning about and using alternative modes, as well as managing the Commuter Alternative Program (CAP) which is an incentive program designed to encourage University and Hospital employees and commuter students to use alternative transportation modes.

If it is assumed that the trip reduction measures that are implicit in the Development Plan and needed to address the reduced parking are applied only to new commuters (in reality they will apply to all commuters), then it is projected that new commuters would travel by the following means:

- Drive alone: 117 (1%)
- Chapel Hill Transit: 5,186 (43%)
- Regional transit: 2,317 (19%)
- Ridesharing: 1,226 (passengers and drivers, 11%)
- Bicycle: 588 (5%)
- Walk: 381 (3%)
- Park-and-ride: 1,672 (14%)
- Other: 577 (5%)

Total (adjusted): 12,065 (100%)

The following should be noted:

- The new ratios hypothetically assume that only new commuters would be subjected to the limited parking and trip reduction strategies. In reality, all parking is pooled and there will be no distinction between new and existing commuters. The aggregate mode split for the entire future employee and commuter student populations is shown in Table 3-2.

- The use of alternative modes includes the proportion of commuters who would use those modes based on current mode split.

In addition to addressing the commuting needs of employees and students, these strategies will also help reduce traffic congestion on Main Campus and reduce exhaust emissions.

An analysis of roadway intersections on or near Main Campus that may be affected by the Development Plan was also undertaken for existing conditions, and year 2030 with and without the Development Plan (No-Build and Build conditions respectively), per the *Transportation Impact Analysis Guidelines*.

It is important to note that impacts of the COVID-19 pandemic have reshaped the workplace. A sustained rise in remote work and learning has impacted parking and transportation demands, as evidenced in data collected for this TIA update.

The updated traffic analysis has resulted in changes in the projections for intersection levels of service in comparison to the 2019 update. Most intersections in the study area are operating at acceptable LOS and most will be expected to continue to operate at acceptable LOS in the No-Build (2030) scenario and in the Build (2030) scenario.

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1.0 INTRODUCTION

This is the eleventh update of the initial Transportation Impact Analysis submitted in July 2001 for the University of North Carolina at Chapel Hill Development Plan. The updates are being submitted to the Town in accordance with the requirements of the Town of Chapel Hill's Office/Institutional-4 (OI-4) Zoning District regulations. The purpose of this updated analysis is to provide an assessment of the transportation implications of the Development Plan and revise mitigation measures, if needed based on the updated analysis, to address impacts. Transportation elements addressed include automobile traffic, transit, parking, bicycle and pedestrian traffic, and associated air quality issues.

The report is divided into three sections. The first discusses population growth and associated increases in Main Campus parking demand and details the impact of the plan and population growth on Main Campus parking. This section provides an estimate of the shortfall in Main Campus parking as a result of employee growth, enrollment expansion, and Development Plan construction. This section also describes modifications to the Development Plan, including the elimination of projects and the addition of new projects. These modifications were approved by the Town in June and August 2003, March 2004, and October 2006. In addition, actual parking changes that have occurred as a result of Development Plan projects are shown.

The next section discusses trip generation and trip reduction strategies. As required by the *Transportation Impact Analysis Guidelines*, vehicular trip generation was first calculated assuming the Development Plan was a hypothetical, suburban development where no or very limited trip reduction strategies applied. The impacts of the proposed trip reduction strategies that are integral to the Development Plan are then calculated for comparison purposes. This section also describes the various strategies that are proposed to address the limited employee and student parking increases in the Development Plan. Two crucial components necessary for updating this section are the University's Commuter Survey (the most recent completed survey was finalized in 2019) and the Transportation Management Plan (undertaken in fall 2021).

The final section provides analyses for key intersections in the Development Plan area and discusses mitigation options where they are warranted.

Extensive data were collected for past updates to provide a baseline set of data for monitoring purposes, and to allow conclusions and recommendations to be made. Some new data have now been collected for the eleventh update to identify trends and refine recommendations where necessary.

In 2021, an abbreviated traffic analysis was completed due to the impacts of COVID-19 on campus population and activities, and published in the Annual Development Plan Report on Transportation. The report included a brief analysis of twelve (12) intersections as directed by staff of the Town of Chapel Hill, while relying heavily on data and analysis completed for the 2019 update to the Transportation Impact Analyses (TIA). Due to the reduced scope in 2021, the data and results presented in this TIA update are compared to the December 2019 update. It is important to note that impacts of the COVID-19 pandemic have reshaped the workplace. A sustained rise in remote work and learning has impacted parking and transportation demands, as evidenced in data collected for this TIA update.

2.0 DEVELOPMENT PLAN

Figure 2-1 and Table 2-1 show and detail University projects planned for construction between 2001 and 2022. The list only includes projects involving new square footage (rehabilitations that add no additional square footage are not included). Changes to the project list were approved by the Town in June and August 2003 (Development Plan Modification No.1), in March 2004 (Development Plan Modification No.2), and in October 2006 (Development Plan Modification No.3).

Development Plan projects (including the modifications) will add approximately 8 million gross square feet of new development to the campus, a 58 percent increase over the campus' existing 13.7 million square feet. Some of the new area is required to address current space deficits (i.e., will not result in an increase in employees or students). During this same period, existing buildings totaling approximately 205,000 gross square feet will be demolished. Parking decks account for about 2.13 million square feet of the Plan. Infrastructure projects make up about 300,000 square feet. Therefore, the net increase in new occupiable floor area for the Development Plan is approximately 5.4 million square feet, or an estimated 44 percent increase over the pre-Development Plan occupiable floor area. Projects in the Plan can be separated into the categories listed below. The chart also indicates changes in square footage since the December 2019 update and includes projects approved as part of Modification No.3.

Classification	Square Footage	Change from
Academic	1,641,028	-227,600
Cultural	140,629	0
Housing	826,015	0
Infrastructure	312,382	0
Office	495,000	0
Parking	2,131,700	0
Research	800,923	0
Student Life	339,699	0
Athletics	388,747	7,700
UNC Health Care	908,870	0
Total	7,984,993	-219,900

Figure 2-1: University of North Carolina at Chapel Hill Development Plan

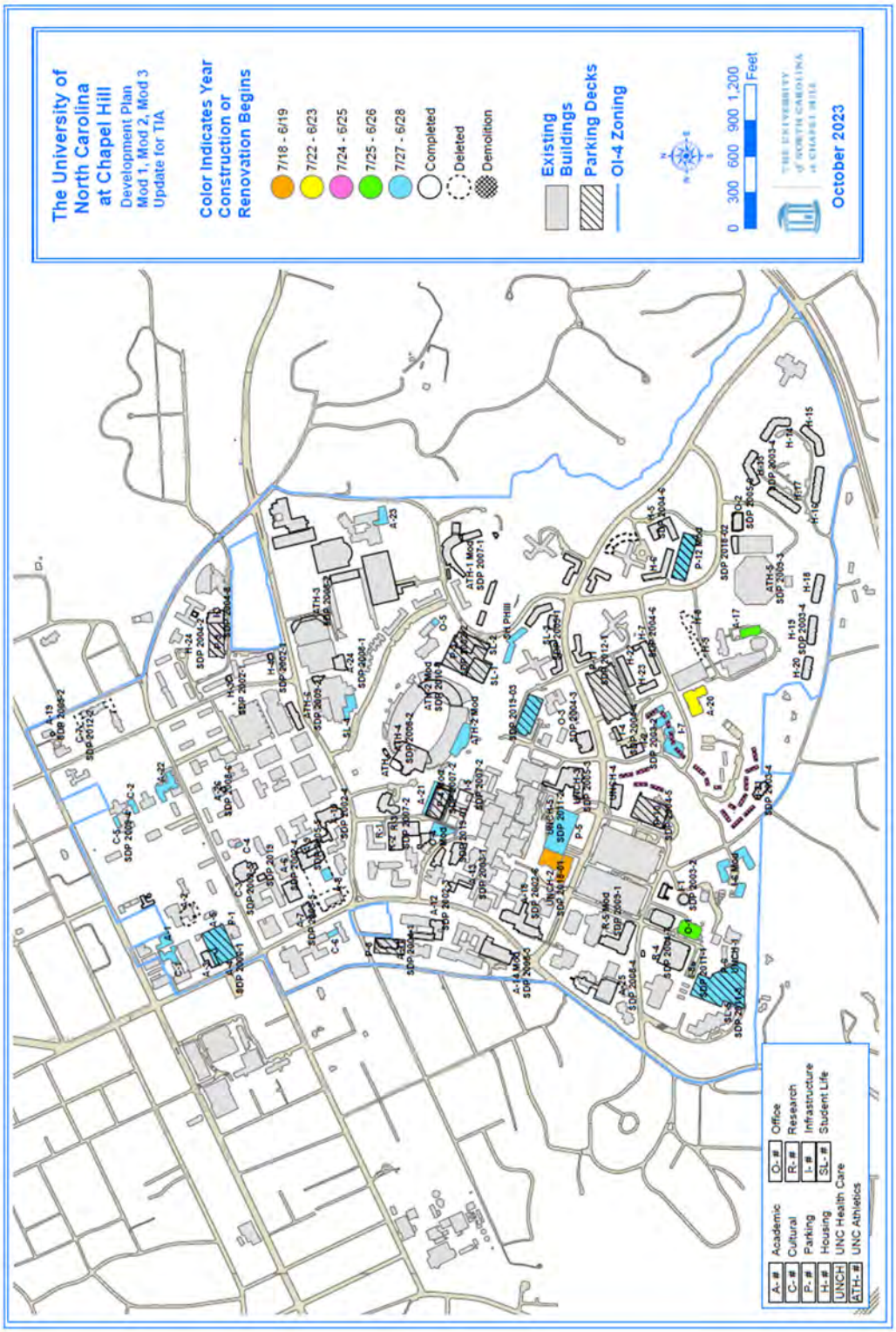


Table 2-1: University of North Carolina at Chapel Hill Development Plan

Building	Building Type	Gross Square Footage	Anticipated Construction Start Date	Anticipated Construction Completion
A-1	Academic	31,800	07/27	07/29
A-2	Academic	Deleted		
A-3	Academic	25,600	03/05	02/07
A-4	Academic	20,000	03/05	02/07
A-5	Academic	55,200	07/27	07/29
A-6	Academic	90,000	07/03	06/05
A-7	Academic	41,000	02/06	08/08
A-8	Deleted			
A-9	Academic	396,700	07/27	07/29
A-10	Academic	112,500	07/03	06/05
A-11	Academic	82,000	03/04	02/06
A-12	Academic	69,500	11/01	10/03
A-13	Academic	10,200	08/02	07/04
A-14 Mod	Academic	259,990	06/08	05/12
A-15	Deleted			
A-16	Deleted			
A-17	Academic	53,200	07/25	07/27
A-18	Academic	936	08/04	03/04
A-19	Academic	1,600	03/05	03/06
A-20 *	Academic	125,000	07/22	07/25
A-21	Academic	80,000	07/27	07/29
A-22	Academic	75,000	07/27	07/29
A-23 *	Academic	50,000	07/27	07/29
A-24	Academic	5,580	06/08	02/10
A-25	Academic	3,308	10/08	01/10
A-26	Academic	1,772	01/09	02/10
MM	Academic	44,321	12/19	10/23
MM	Academic	5,821	12/19	06/21
	Total Academic	1,641,028		
C-1	Cultural	36,000	07/27	07/29
C-2	Cultural	26,400	07/27	07/29
C-3	Cultural	37,325	12/01	01/03
C-4	Cultural	3,000	07/27	07/29
C-5 Mod	Cultural	22,904	07/27	07/29
C-6	Cultural	15,000	07/27	07/29
	Total Cultural	140,629		
H-1	Housing	Deleted		
H-2	Housing	Deleted		
H-3	Housing	6,656	05/02	07/03
H-4	Housing	6,656	05/02	07/03
H-5	Housing	68,400	01/04	08/05
H-6	Housing	60,000	01/04	08/05
H-7	Housing	74,800	01/04	08/05
H-8	Housing	Deleted		
H-9	Housing	Deleted		
H-10	Housing	Deleted		
H-11	Housing	Deleted		
H-12	Housing	Deleted		
H-13	Housing	60,500	08/03	08/04
H-14	Housing	60,500	08/03	08/04
H-15	Housing	58,200	08/03	08/04

H-16	Housing	59,400	08/03	08/04
H-17	Housing	59,400	08/03	08/04
H-18	Housing	44,400	08/03	08/04
H-19	Housing	44,400	08/03	08/04
H-20	Housing	37,600	08/03	08/04
H-21	Housing	30,050	08/03	08/04
H-22	Housing	79,601	01/04	08/05
H-23	Housing	79,600	01/04	08/05
H-24	Housing	7,800	01/04	08/05
SH PHIII	**Housing**	**125,000**	**07/27**	**07/29**
H	**Housing**	**(136,948)**	**11/19**	**12/24**
	Total Housing	826,015		
I-1	Infrastructure	20,000	07/03	12/04
I-2	Infrastructure	115,600	08/03	07/05
I-3	Infrastructure	21,600	03/04	03/06
I-4	Infrastructure	6,382	06/04	12/05
I-5 Mod	Infrastructure	100,800	01/08	07/10
I-6	**Infrastructure**	**48,000**	**07/27**	**07/29**
I-7	**Infrastructure**	**N/A**	**07/27**	**07/29**
	Total Infrastructure	312,382		
O-1	**Office**	**168,000**	**01/26**	**01/28**
O-2	Office	30,000	11/02	05/06
O-3	Office	105,000	07/04	03/06
O-4	**Office**	**180,000**	**07/27**	**07/29**
O-5	**Office**	**12,000**	**07/27**	**07/29**
	Total Office	495,000		
P-1	**Parking**	**115,500**	**07/27**	**07/29**
P-2	Parking	Deleted		
P-3	Parking	252,600	05/02	10/04
P-4 Mod	Parking	225,000	03/07	08/10
P-5	**Parking**	**255,500**	**07/27**	**07/29**
P-6	**Parking**	**134,400**	**07/27**	**07/29**
P-7	*Parking*	*Deleted*		
P-8	Parking	42,000	03/03	07/06
P-9	Parking	191,500	03/03	03/06
P-10	Parking	350,000	04/04	12/05
P-11	Parking	288,000	09/12	06/14
P-12	**Parking**	**96,200**	**07/27**	**07/29**
MM	**Parking**	**181,000**	**07/27**	**07/29**
	Total Parking	2,131,700		
*This represents relocation of planned surface parking to spaces beneath the buildings.				
R-1	Research	109,000	07/07	03/12
R-2	Research	49,000	07/07	03/12
R-3	Research	74,400	07/07	03/12
R-4	Research	225,000	08/02	12/04
R-4 MM	Research	523	09/11	12/11
R-5	Research	343,000	06/09	01/14
	Total Research	800,923		
SL-1	Student Life	54,400	06/02	07/04

SL-2	Student Life	126,900	06/02	07/04
SL-3	Student Life	126,000	06/04	08/05
SL-4	**Student Life**	**28,000**	**07/27**	**07/29**
MM	Student Life	4,399	06/05	03/06
	Total Student Life	339,699		
UNCH-1	**UNC Health Care**	**196,280**	**07/27**	**07/29**
UNCH-2	**UNC Health Care**	**343,180**	**07/18**	**05/24**
UNCH-3	UNC Health Care	291,890	03/05	02/08
UNCH-4	UNC Health Care	130,000	03/06	07/07
UNCH-5	UNC Health Care	(53,546)	12/11	06/12
UNCH-6	UNC Health Care	1,066	01/12	03/12
	Total UNC Health Care	908,870		
ATH-1	Athletics	41,181	05/07	01/08
ATH-2	**Athletics**	**170,189**	**07/27**	**12/29**
ATH-3	Athletics	15,059	05/08	02/10
ATH-4	Athletics	19,194	01/08	08/09
ATH-4 MM	Athletics	1,000	06/10	08/10
ATH-5	Athletics	6,467	03/10	01/11
ATH-6	Athletics	4,069	01/10	10/10
ATH	Athletics	123,000	05/16	08/18
ATH	Athletics	10,000	05/16	08/18
ATH	Athletics	(13,417)	05/17	05/19
ATH	Athletics	(1,663)	05/17	05/19
ATH	Athletics	5,968	08/18	08/19
ATH	Athletics	7,700	03/22	11/23
	Total UNC Athletics	388,747		
	Campus Total	7,984,993		

2.1 POPULATION GROWTH

Anticipated growth in employees and student enrollment during the course of the Development Plan is shown in .

Table **2-2** and Table 2-3 below. These growth projections were derived from those in the previous TIA update by creating a compound annual growth rate (CAGR) from 2000-2022 projections and applying those to a two-year forecast. The tables show an anticipated increase in employees of 77 percent and student growth of 26 percent overall from 2000 to 2024. The 2024 growth projections were developed to identify a build year for the traffic analysis and may not necessarily reflect a construction schedule for Development Plan projects.

Parking impacts for each of these groups are discussed in the following section.

Table 2-2: Anticipated Employee Growth (2000-2024)

	2000	2024	2000-2024	Growth Rate
Number of Employees	14,303	25,355	11,052	77%
On Main Campus	13,016	22,183	9,167	70%
Off Main Campus	1,287	3,187	1,900	148%

Notes:

1. Permit data were used to estimate the percentage of year 2000 employees who worked (and parked) off-campus, which was approximately 9 percent. It is assumed that the same percentage of employees will work off-campus in 2024.

2. 2024 projections were made using a compound annual growth rate derived from the most recent University population projections.

Table 2-3: Anticipated Student Growth (2000-2024)

	2000	2024	2000-2024	Growth Rate
Number of Students	24,872	31,377	6,505	26%
Resident Students	7,244	9,497	2,253	31%
Commuting Students	17,628	21,881	4,253	24%

Notes:

1. The year 2000 breakout of resident and commuting students was based on the existing number of beds. For year 2022 the breakout was adjusted to account for a forecast increase in resident students of 2,041. This projection was held constant for 2024.

2. All students not accommodated by residence halls or family housing are assumed to be commuting students.

3. In the original Development Plan and subsequent updates, the 2000 Number of Students was erroneously listed as 25,872 instead of 24,872. This also affected the 2000 Commuting Students (18,628 instead of 17,628) and the forecast growth rates. This table shows the corrected data. The data for resident students are unaffected.

4. 2024 projections were made using a compound annual growth rate derived from the most recent University population projections.

2.2 PARKING IMPACTS

2.2.1 Existing Parking

The total number of parking spaces owned by the University in the 2000/2001 academic year was 17,620, of which approximately 14,200 were on Main Campus (excluding motorcycle parking). Of these, approximately 5,450 were in four parking decks on South Campus. Main Campus parking facilities are shown in Figure 2-2. In 2001, and currently, there is not enough parking on Main Campus for all employees wanting to park there. In 2001 there were approximately 8,000 spaces for approximately 13,000 Main Campus employees, or 0.61 spaces per Main Campus employee (because of the oversell ratio - which accounts for some people not being on Main Campus on any particular day because of vacation, illness, etc. - the number of parking permits issued is higher, 0.77 per employee in 2001).

The rate for students is much lower (less than 10 percent for both resident students and commuting students). Freshmen are not eligible for a parking permit.

2.2.2 Displaced Parking

The Development Plan will permanently displace 4,061 existing surface spaces (excluded from this number are temporary losses due to construction staging and 428 student family spaces which are added back with the construction of new student family units). These anticipated losses are shown by location and user in Table 2-4 and Figure 2-3. It should be cautioned that these are estimates only, and that several factors could affect the actual losses:

- Included are spaces lost to future parking deck construction. The final size and configuration of the deck will determine how many surface spaces, if any, could be retained.

- It has been assumed that some service and disability spaces, as well as some permit spaces at some sites, may be retained. The actual number will depend on the configuration of future buildings, landscaping, etc.

2.2.3 Additional Main Campus Parking

The Development Plan will permanently add 5,640 new spaces to Main Campus (this includes a net increase of 25 spaces for student family housing and 32 employee spaces that have yet to be assigned to a location). Of the remaining 5,583 spaces, 5,425 are being provided in nine new structures (either free-standing decks or on the lower level of buildings) and one expansion (the Craige Deck), and 158 are surface spaces added back where building projects have already been completed. In July of 2013, the Craige Parking Deck Expansion project began. This vertical expansion provided four additional levels and 990 spaces by the project's completion in August of 2015. These Development Plan spaces are shown in Table 2-4 and Figure 2-3. The breakdown of new deck spaces is shown in Table 2-5. As with the losses, these are estimates only.

Outside the scope of the Development Plan is the removal of the CG Helipad lot for the construction of the Surgical Tower, and the redevelopment of the S1 Public Safety lot. With the removal of the CG Helipad Lot and additional parking made available in the Surgical Tower, this lot lost a net 107 spaces. The redevelopment of the S1 lot resulted in

a net loss of 63 spaces. The Kenan Flagler Business School project resulted in a net gain of 84 spaces. These projects combined for a net loss of 86 spaces.

Figure 2-2: Existing Main Campus Parking Facilities

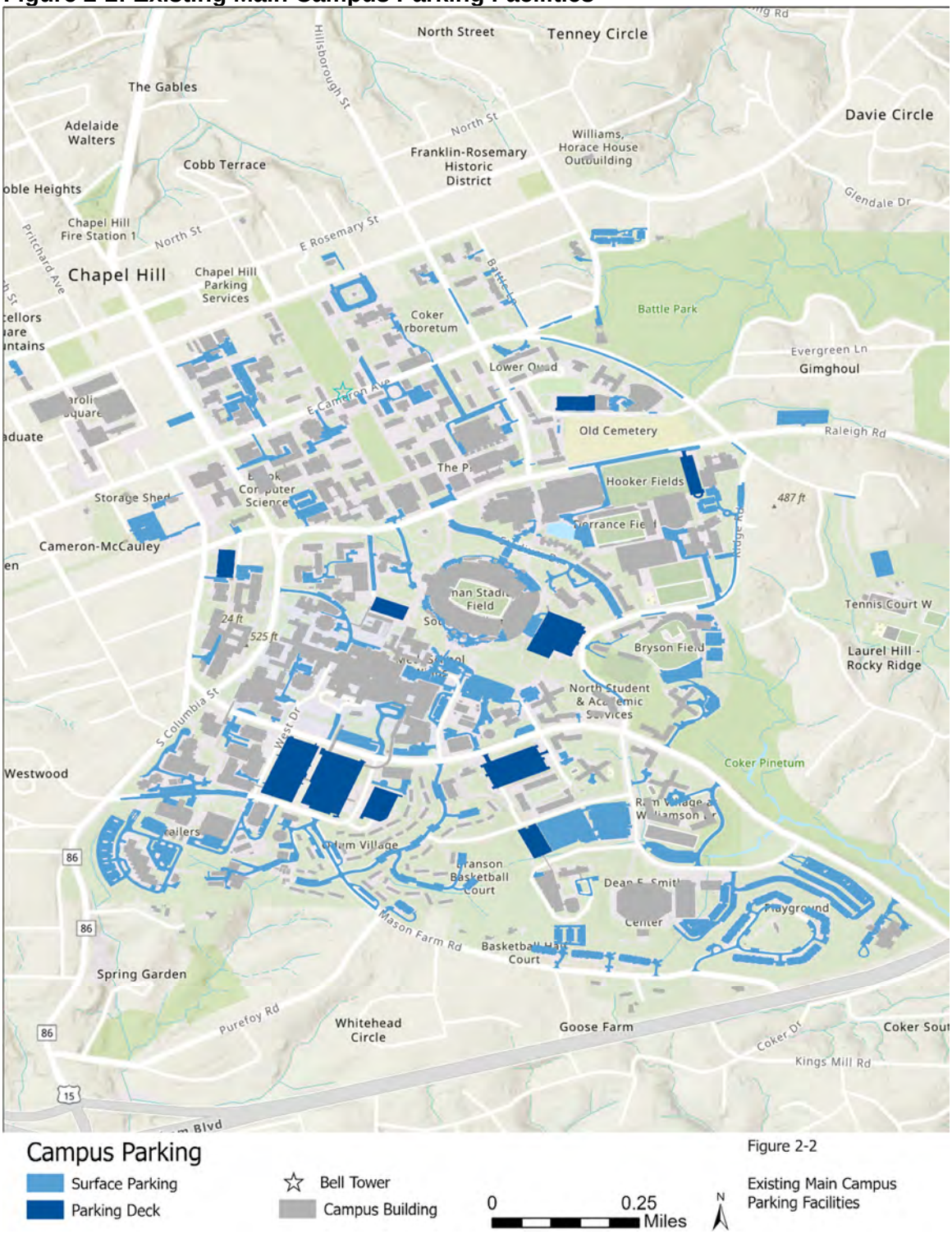


Table 2-4: Parking Impacts of Development Plan

	Number of Spaces[1,2]							
Lot / Project Name	Parking Zone	Employee	Commuting Student	Resident Student	Student in Family Housing	Visitor	Other	Net Change
ACC (new structure)						198		198
Bell Tower (new structure)	BG	124						124
Bowles	S11	-471	-157					-628
Cameron/Swain (Arts Common Deck - new structure)	ND1/NG1	-154				270		116
Cobb/Joyner (new structure and surface parking)		126	-33			-6	-8	79
Craige Surface	CD	-212		-37				-249
Craige Deck Expansion	CD	990						990
Dental School	S6	-53						-53
Glaxo / Housing Support / MFM / MRI	S6	-46						-46
Gravely (NC H&C) (new structure)	CG	-135				730		595
Hanes						-48	16	-32
Hinton James	M			-250				-250
ITS		-29				-2	24	-7
Jackson Deck (new structure)		606	100		-54			652
Kenan/McColl Visitor Parking						-40		-40
McCauley Street (Global Education Deck - new structure)	W	-20						-20
Neurosciences	CG	-158				50		-108
North Medical Drive							-26	-26
Porthole	N2	-40						-40
Rams Head (new structure)	S5	-16				303		287
Stadium Drive	S4							0
Sitterson	NG2	-135						-135
South Chiller	S6	-129						-129
Student Family Housing	MR/MR2				79			79
Tennis Court Deck (new structure)		231						231
Wilson Library	N8	-41						-41
Subtotal		**438**	**-90**	**-287**	**25**	**1,455**	**6**	**1,547**
Unassigned spaces [3]		32						32
Total								**1,579**

Notes:
1. Numbers are subject to change, depending on the final footprint of each project.
2. These numbers represent net changes only. For example, the Rams Head structure has 700 spaces, but 413 were displaced as a result of its construction. The net impact, which is shown in this table, is 287 spaces.
3. Spaces not assigned to a specific location on the campus and whose location(s) will be determined in future development plan modification requests. The total net change in parking is 32 spaces less than the approved 1,579 space increase, but the traffic assessment accounts for the entire 1,579 space net increase.

Table 2-5: Summary of New Parking Decks in Development Plan

Facility	Spaces
ACC	350
Bell Tower	710
Cameron (Arts Common)	330
Cobb/Joyner	450
Craige Expansion	990
Jackson Circle	800
McCauley (Global Education Center)	134
NC H&C (Gravely)	730
Rams Head	700
Tennis Court	231
Total	**5,425**

Figure 2-3: Parking Impacts of Development Plan

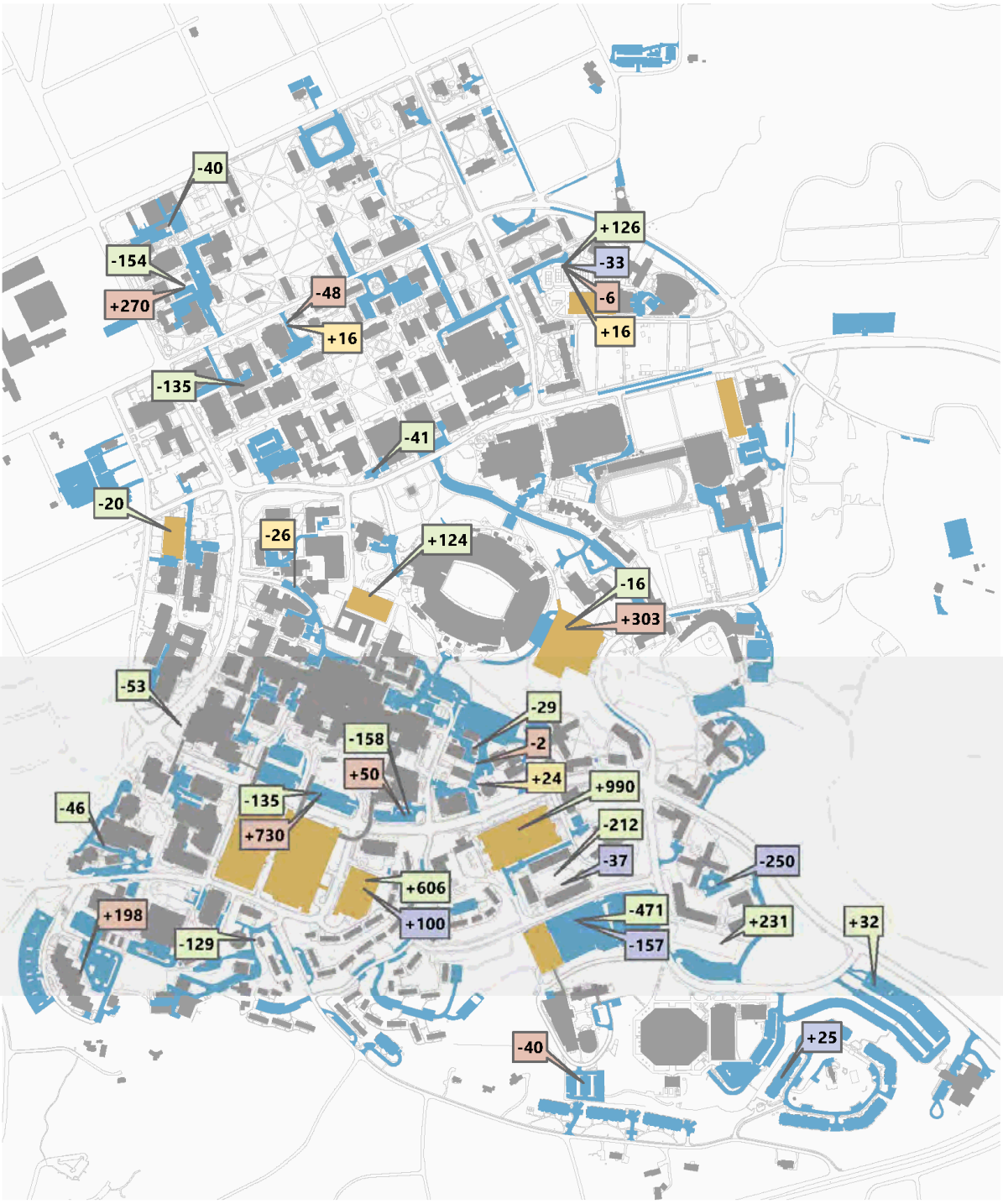


Figure 2-3

Parking Impacts of Development Plan

Unassigned Spaces

The 32 unassigned spaces mentioned in the previous section indicate the difference between the approved net increase of 1,579 parking spaces and the current number of 1,547. In the February 2006 Update, there were 331 unassigned spaces. In Modification No.3, those 331 spaces were assigned to the new Tennis Court deck and to an expansion of the Craige Deck, leaving no spaces unassigned. The current figure of 32 unassigned spaces reflects the actual parking changes from Development Plan projects that have occurred since the 2006 Update. This is consistent with the 2019 update.

The traffic assessment element of this report must account for the entire approved 1,579 space increase in Development Plan traffic, so the 32 unassigned spaces were added to bring the total to 1,579. This report also incorporates changes in space totals due to projects the university completes outside the scope of the Development Plan. These 86 spots, referenced in section 2.2.3, bring the total unassigned spaces for traffic assessment to 118. For this report, these spaces have been assigned to the former Manning Deck site but it is recognized that this deck will not be constructed during the Development Plan period. The actual locations for these spaces will be included in future Development Plan modification requests.

2.2.4 Actual Parking Space Impacts of Development Plan Projects

Table 2-6 shows the actual parking space impacts of Development Plan projects in 2001/2 through 2022/23, plus the planned impacts in 2023/24 and beyond, and how these compare to the projected changes shown in previous updates. The major differences are due to changes in project schedules, with the timing of the parking impacts changing accordingly. It is important to note that where projected losses exceed actual ones, the losses still will occur, just not as early as was projected in the previous plan update.

Table 2-6: Actual Parking Impacts of Development Plan Projects (2001/2 – 2023/24)

User Group	2001/2		2002/3		2003/4		2004/5		2005/6		2006/7		2007/8		2008/9		2009/10	
	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected
Employee	0	0	-258	-200	-116	-307	-712	-512	198	-232	680	-34	-675	1,605	-40	-40	0	0
Commuting Student	0	0	-90	-298	0	0	57	57	0	-57	100	0	0	0	0	0	0	0
Resident Student	0	0	0	0	0	-56	-287	-11	0	-278	0	0	0	0	0	0	0	0
Student in Family Housing	0	0	0	0	0	-428	436	456	-411	0	0	0	0	0	0	0	0	0
University Visitor	0	-48	-97	-154	-48	-68	392	392	0	-80	0	250	0	0	-60	-60	0	0
Hospitals Visitor	0	0	0	-152	0	0	0	0	0	0	0	0	0	0	0	0	50	50
Other	0	-20	-49	-30	0	0	22	6	0	23	33	27	0	0	0	0	0	0
Total	**0**	**-68**	**-494**	**-834**	**-164**	**-859**	**-92**	**388**	**-213**	**-624**	**813**	**243**	**-675**	**1,605**	**-100**	**-100**	**50**	**50**

User Group	2010/11		2011/12		2012/13		2013/14		2014/15		2015/16		2016/17		2017/2018		2018/2019	
	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected
Employee	746	746	0	0	0	0	-400	-400	1,390	1,390	0	0	0	0	0	0	0	0
Commuting Student	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Resident Student	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Student in Family Housing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
University Visitor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hospitals Visitor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**746**	**746**	**0**	**0**	**0**	**0**	**-400**	**-400**	**1,390**	**1,390**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

User Group	2020/21		2021/22		2022/23		2023/24	
	Planned	Projected	Planned	Projected	Planned	Projected	Planned	Projected
Employee	-135	-135	0	0	0	0	470	-240
Commuting Student	0	0	0	0	0	0	-90	-157
Resident Student	0	0	0	0	0	0	-287	0
Student in Family Housing	0	0	0	0	0	0	25	0
University Visitor	0	0	0	0	0	0	477	290
Hospitals Visitor	-152	-152	0	0	0	0	978	1,080
Other	0	0	0	0	0	0	6	0
Total	**-287**	**-287**	**0**	**0**	**0**	**0**	**1,579**	**973**

Notes:
1. Parking changes do not include impacts of non-Development Plan projects.
2. These are net changes, reflecting permanent and temporary space changes.
3. Projected numbers for 2001/2 and 2002/3 are those that were in the 2002 and 2004 updates.
   Projected numbers for 2003/4, 2004/5 and 2005/6 are those that were in the 2004 update.
   Projected numbers for 2006/7 and 2007/8 are those that were in the 2006 update.
   Projected numbers for 2007/8, 2008/9 and 2009/10 are those that were in the 2009 update.
   Projected numbers for 2010/11 are those that were in the 2011 update.

2.2.5 Future Parking Demand

Table 2-7 summarizes the demand for Main Campus parking spaces by user group based on current demand, projected employee growth rates, and parking impacts of the Development Plan. It is important to note that impacts of the COVID-19 pandemic have reshaped the workplace. A sustained rise in remote work and learning has impacted parking and transportation demands, as evidenced in data collected for this TIA update. The findings of this table are summarized in this section.

Table 2-7: 2022 Main Campus Parking Impact Summary (Commuter and Patient/Visitor only)

A.	Employee[1]	Student		Total
		Resident	Commuter	
Existing ratio of Main Campus spaces to population[2]	0.61	0.08	0.09	
Future Population Increases (2001 - 2024)	9,167	2,253	4,253	
Future New Main Campus Parking Demand[3]	5,634	181	367	6,182
Net Parking Provided in Development Plan[4]	470	(287)	(90)	93
(Shortage)/Surplus[5]	**(5,164)**	**(468)**	**(457)**	**(6,089)**
compared to (Shortage)/Surplus in 2006 Update [8]	***(2,250)***	***(505)***	***(205)***	***(2,960)***

B.	Patient/Visitor		Total
	Hospitals	University	
Existing Demand[6]	1,755	920	2,675
Future Growth (2001-2022)[7]	1.37	0.49	--
Future New Demand	2,403	448	2,850
Net Parking Provided in Development Plan	978	477	1,455
Existing Empty Spaces[9]	250	0	250
(Shortage)/Surplus	**(1,175)**	**29**	**(1,145)**
compared to (Shortage)/Surplus in 2006 Update	***(44)***	***54***	***10***

[1] Employees working on Main Campus Only. Parking permits for "prime remote" locations were used to estimate the number of employees working off-campus (9 percent). It is assumed that these employees get parking spaces.

[2] Assumes that parking is satisfied according to existing (2001/2002) ratio of spaces to population.

[3] Calculated by multiplying future increase by existing ratio of spaces to population.

[4] See Table 2-4. Excludes the changes in student family housing and "other" spaces. Employee figure includes the "unassigned" spaces.

[5] It is assumed that no additional (net) student parking will be provided on Main Campus. Any unsatisfied demand must be accommodated by use of alternative modes, park-and-ride, or storage lots.

[6] Existing occupied spaces. Based on Year 2000 data. Corrected figures. The original Development Plan and subsequent updates had incorrectly allocated some spaces to University visitors rather than Hospital patients/visitors.

[7] Hospitals patient/visitor growth based on 2010 projections. University visitor growth assumed to equal growth in occupiable square footage (approximately 49 percent).

[8] In the original Development plan and subsequent updates, the employee population increase was listed as the full growth number (5,034) instead of the Main Campus growth (4,581). This also affected the "shortage/surplus" line. This table shows the corrected data in the "compared to (Shortage)/Surplus in 2006 update" line. The current forecast is unaffected.

[9] An estimated 250 patient/visitor spaces were empty in the Dogwood Deck in 2000. These are not included in the existing demand figure. The empty spaces were erroneously omitted from previous updates.

Employees
University and Hospitals employment on Main Campus is projected to increase by 9,167 employees by 2024, over the twenty-four-year timeframe of the Development Plan. If parking were provided at the 2001 ratio of 0.61 Main Campus spaces per employee, approximately 5,634 more spaces would be needed on Main Campus to support the Development Plan. Of the net increase of 1,579 spaces, 470 are allocated to employees. Therefore, by 2024, there would be a net shortage of approximately 5,164 Main Campus parking spaces for employees.

Resident Students
Resident student enrollment is projected to increase by 2,253 students over the twenty four-year period. If Main Campus parking for resident students were provided at the 2001 ratio of 0.08 Main Campus spaces per resident student, approximately 181 new spaces would be needed to support the increased resident enrollment. Increased parking for resident students is not provided for in the Development Plan, which actually decreases the amount of resident student parking on Main Campus. The total "shortfall" is approximately 468 spaces. These vehicles have been accommodated in the expanded RR lot.

Of the 2,253 increase in resident students, 92 will be in family housing. The Odum Village housing has been replaced with new housing on Baity Hill and along the north side of Mason Farm Road. The new housing has an additional 25 parking spaces.

Commuting Students
Commuter student enrollment is projected to increase by 4,253 students in the same timeframe. Using the same methodology as described for employees and resident students, Table 2-7 indicates an increased demand for Main Campus parking by commuting students of approximately 367 spaces. The net change in parking spaces for commuting students as a result of the Development Plan projects is a decrease of 90 spaces. Therefore, the "shortfall" is approximately 457 spaces.

Patients/Visitors
To forecast the parking demand for Hospitals and University patients and visitors, the 2001 demand (assumed to be the number of spaces occupied by patients/visitors) was projected to grow by the anticipated growth rate in number of patients and visitors for the Hospitals (137 percent) and by the growth rate in occupiable square footage (excludes parking decks) for University visitors (approximately 49 percent).

> Hospitals Patients/Visitors. New patient/visitor demand is projected to be 2,403 spaces. At the start of the Development Plan, approximately 250 spaces were empty in the Dogwood Deck, and the Development Plan provides a further increase of 978 patient/visitor spaces, resulting in a projected shortfall of about 1,175 patient/visitor spaces.
>
> University Visitors. Assuming a 49 percent increase in University visitors, there would be an increase in visitor demand for Main Campus spaces of 448 spaces. The Development Plan provides a net increase of 477 visitor spaces. Therefore, there is a projected surplus of about 29 spaces for University visitors.

2.2.6 Year-By-Year Impact

Table 2-8 builds on the information above, to show the impact of the Development Plan on parking spaces, Main Campus growth, and parking needs for each year (2001-2024). The first section of the table shows parking space impacts by year and user, based on Development Plan projects; the second section shows projected new demand by year and user, based on projected growth; and the last section of the table shows the net parking impact (spaces gained/lost minus projected new demand) by year and user.

The year-by-year numbers for spaces gained and lost (and therefore the net impacts) in Table 2-8 are different from earlier updates as a result of changes in project schedules and actual impacts from projects built so far.

The total parking "shortfall" for the 24-year plan is approximately 8,554 spaces. However, this includes about 451 spaces for resident students, whose demand will be accommodated in storage parking lots and will therefore not need to be accommodated by TDM strategies. This leaves a shortfall of about 8,103 spaces for which alternatives will need to be provided, as described in the next section.

Table 2-8: Main Campus Parking Space Analysis by Year and User

	2001 2002	2002 2003	2003 2004	2004 2005	2005 2006	2006 2007	2007 2008	2008 2009	2009 2010	2010 2011	2011 2012	2012 2013	2013 2014	2014 2015	2015-2016	2016 2017	2017 2018	2018 2019	2019 2020	2020 2021	2021 2022	2022 2023	2023 2024	Total
Spaces Gained/Lost[1,A]																								
Employee	0	-258	-116	-712	198	680	-675	-40	0	748	0	0	-400	1,390	0	0	0	0	0	-135	0	0	-208	470
Commuting Student	0	-90	0	57	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-157	-90
Resident Student	0	0	0	287	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	287
Student Family Housing[2]	0	0	0	436	-411	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
University Visitor	0	-97	-48	392	0	0	-60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	290	477
Hospitals Visitor	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	-152	0	0	1,080	976
Other[3]	0	-49	0	22	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Total Spaces Gained/Lost	0	-494	-164	-92	-213	613	-675	-100	50	748	0	0	-400	1,390	0	0	0	0	0	-287	0	0	1,005	1,579
Projected New Demand																								
Employee[B]																								
New employees	453	845	390	504	152	197	294	424	187	147	145	107	95	152	567	587	587	587	587	587	587	482	482	9,167
Existing ratio (spaces to empl.)	0.61																							
Projected new demand	276	519	240	310	93	121	181	261	115	90	89	66	58	93	361	361	361	361	361	361	361	296	296	5,634
Students																								
Commuting Student																								
New comm. Students[4]	592	334	164	511	330	162	3	108	146	112	111	94	88	73	150	190	190	190	190	190	190	301	301	4,464
Existing ratio	0.06																							
Projected new demand	51	29	14	44	33	14	0	9	13	10	10	8	6	6	16	16	16	16	16	16	16	26	26	386
Resident Student																								
New res. students	0	230	167	8	18	603	416	344	157	99	0	0	0	0	0	0	0	0	0	0	0	0	0	2,041
Existing ratio	0.06																							
Projected new demand	0	18	13	1	1	48	33	28	13	8	0	0	0	0	0	0	0	0	0	0	0	0	0	104
University Visitor																								
Existing visitor spaces[A]	1,755																							
Projected annual growth rate	0.06																							1.37
Projected new demand[B]	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	3,684
Absorbed by existing vacant spaces[4]	156	94	0	0	0	0	0	0	0	0	0	0	0	0										250
Net new demand	4	66	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	3,434
Total New Demand	356	664	449	636	309	337	396	479	322	289	280	255	246	261	569	569	569	569	569	569	569	504	504	10,108
Net Impact[C]																								
Employee	276	777	366	1,022	105	559	856	301	115	656	69	66	458	1,297	361	361	361	361	361	496	361	296	504	5,164
Commuting Student	51	119	14	13	33	114	0	9	13	10	10	8	6	6	16	16	16	16	16	16	16	26	183	475
Resident Student	0	18	13	288	1	48	33	28	13	8	0	0	0	0	0	0	0	0	0	0	0	0	0	451
University Visitor	21	118	69	371	21	21	21	81	21	21	21	21	21	21	21	21	21	21	21	21	21	21	289	13
Hospitals Patient/Visitor	4	66	160	160	160	160	160	160	110	160	160	160	160	160	160	160	160	160	160	312	160	160	920	2,456
Other	0	49	0	22	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
All Users (anrual impact)[7]	356	-1,148	-613	-1,064	-111	476	-1,071	-579	-272	457	-280	-255	-646	1,109	-559	-559	-559	-559	-559	-846	-559	-504	591	-8,554
All Users (cumulative impact)[7]	356	-1,503	-2,116	-3,180	-3,291	-2,815	-3,886	-4,465	-4,737	-4,280	-4,560	-4,816	-5,461	-4,353	-4,911	-5,470	-6,029	-6,588	-7,147	-7,993	-8,551	-9,055	-7,491	
Annual impact less res. students	356	-1,130	-599	-776	-110	524	-1,037	-561	-256	464	-280	-255	-646	1,109	-559	-559	-559	-559	-559	-846	-559	-504	591	-8,103

3.0 TRIP GENERATION AND REDUCTION STRATEGIES

This section updates trip generation and the proposed trip reduction strategies and their estimated impacts. As required by the *Transportation Impact Analysis Guidelines*, vehicular trip generation was first calculated assuming the Development Plan was a hypothetical, suburban development where no or very limited trip reduction strategies applied. The impacts of the proposed trip reduction strategies that are integral to the Development Plan are then calculated for comparison purposes.

The remainder of this section describes the various strategies that are proposed to address the limited employee and student parking increases in the Development Plan, and their impact on alternative modes. The air quality impacts of these strategies also are estimated.

Updates to this section include assessing:

- The effects of Modifications No.1 - No.3 changes to the Development Plan (which also have changed the year-by-year parking shortfalls and associated park-and-ride needs).
- The results of a Commuter Survey undertaken in 2019.
- Updates to Table 3-1 using ITE Trip Generation Manual, 11th edition
- Changes in current use of park-and-ride with the new park-and-ride fees introduced in fall 2013.
- New transit ridership, bicycle, and pedestrian counts.
- Refinements to the projections of future mode splits (i.e., how many commuters may be traveling to the campus in 2024), based on the results of the 2019 University Commuter Survey.

3.1 ESTIMATED VEHICULAR TRIP REDUCTIONS

As required by the *Transportation Impact Analysis Guidelines*, an estimate of the impact of the proposed trip reduction strategies on the amount of vehicular trips that will be generated by the Development Plan has been made by comparing it with a similar, hypothetical development where no, or very limited, trip reduction strategies applied.

3.1.1 Trip Generation Based on the Institute of Transportation Engineers Trip Generation Manual

The amount of vehicular traffic that could be generated by the Development Plan if it were a typical suburban development was estimated using trip rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (11th Edition). The ITE *Trip Generation Manual* is the standard document used by traffic engineers for estimating the amount of traffic that will be generated by a new development for projects across the U.S, including Chapel Hill.

Trips were estimated for the A.M. and P.M. peak hours, and for a typical weekday (24-hour period) using the following land use categories that are included in the ITE manual:

- University/College (ITE Land Use Code 550) for all academic-related buildings (buildings referred to as Academic, Cultural, Office and Student Life in the Development Plan).

- Research and Development (ITE Land Use Code 760) for all buildings referred to as Research in the Development Plan.

- Hospital (ITE Land Use Code 610) for all buildings referred to as UNC Healthcare in the Development Plan.

- Supermarket (ITE Land Use Code 850) for the convenience store in the Rams Head project (even though almost all customers walk to the store).

- Apartments (ITE Land Use Code 220) for the 398 family housing units and 1,000 beds.

These land uses, the basis for estimating vehicular trips, and the generated trips are shown in Table 3-1. The following should be noted:

- The increase in the number of students is used as the basis for estimating traffic generated by the University/College. (Estimating traffic by taking the difference in traffic generated by the existing enrollment and the future enrollment yields a very similar answer.)

- The store is assumed to be a typical suburban facility for the purpose of determining ITE traffic generation.

- The ITE housing category of apartments is used for all housing by assuming for trip generation purposes that (a) each non-family residential housing unit, which has four beds (for a total of 1,000), is roughly equivalent to two apartments (i.e., a total of 500), and (b) each of the 398 family housing units is equivalent to one apartment.

3.1.2 Reduced Parking

The ITE analysis provides an estimate of the vehicular trips that would be generated in a suburban setting without trip reduction measures. Obviously, the University has for many years been employing trip reduction strategies that would result in the Development Plan generating less traffic than the above analysis. These include limiting parking and supporting the Town's transit and park-and-ride systems. At the inception of the Development Plan, there were only approximately 0.61 spaces on Main Campus for every Main Campus University/Hospitals employee (or a ratio of Main Campus parking spaces to employees of 0.61). In addition, freshmen are not eligible for a permit.

An integral element of the adopted Main Campus Master Plan is to minimize the increase in Main Campus parking as the campus grows, by promoting and increasing the use of alternative forms of transportation. The parking and transportation initiatives that are inherent in the Development Plan are consistent with the transportation strategy for the Master Plan.

Table 3-1: ITE Trip Generation Rates

ITE Land Use Code	USE	Gsf/Units	ITE MANUAL RATES*			
			ADT	AM Enter	AM Exit	AM Total
550	University/College	5,903 students	10,255	415	117	532
760	Research & Dev. Center	787,400 sf	7,885	595	130	725
610	Hospital	961,350 sf	8,555	513	253	766
850	Supermarket	10,000 sf	938	17	12	29
220	Apartments	898 dwelling units	5,831	72	229	301
	LAND USE TOTALS		**33,465**	**1,612**	**740**	**2,353**

ITE Land Use Code	USE	Gsf/Units	ITE MANUAL RATES*			
			ADT	PM Enter	PM Exit	PM Total
550	University/College	5,903 students	10,255	242	515	757
760	Research & Dev. Center	787,400 sf	7,885	110	576	686
610	Hospital	961,350 sf	8,555	275	510	785
850	Supermarket	10,000 sf	938	45	45	90
220	Apartments	898 dwelling units	5,831	256	151	407
	LAND USE TOTALS		**33,465**	**928**	**1,797**	**2,725**

*Trip Generation Manual, 11th Edition, Institute of Transportation Engineers.

The increase in Main Campus employee and student parking accompanying the Development Plan is significantly less than current ratios. Therefore, an increased proportion of employees and students will need to use alternative modes to commute to campus. The increased use of alternatives is commensurate with the reduced amount of parking.

The estimated parking "shortfalls" are described in Section 2.2.5.

It should be noted that trip reduction strategies apply to students and employees only. The needs of visitors, particularly hospital patients and visitors, will continue to be satisfied.

3.1.3 Vehicular Trip Reduction

The vehicular trips that would have been generated by the "shortfall" spaces represent the reduction in campus traffic compared to providing parking at 2001 ratios, while the employees and students that would have used these spaces represent the required increase in use of alternatives modes. As indicated earlier, the Development Plan results in a net increase of 1,579 spaces on Main Campus (an additional 411 employee/commuter student spaces and 1,455 visitor spaces, and a reduction of 287 resident student spaces). The net changes in parking will generate approximately 11,487 daily vehicular trips (calculated in Section 4.0), or approximately 33 percent of the amount determined using the ITE rates in Table 3-1 (33,465 daily trips).

It should also be noted that the reduced parking ratios and corresponding traffic reductions are not limited to new employees and students. Trip reduction strategies to achieve these reductions are now, and will continue to be, implemented across the entire campus

population. For example, the use of alternative modes to compensate for the approximate 8,100-space "shortfall" must entail enticing some current employees to switch from driving alone and parking on Main Campus to transit, ridesharing, or using park-and-ride.

3.2 TRIP REDUCTION STRATEGIES AND IMPACTS

As described earlier, on a typical day there will be a parking "shortfall" of approximately 8,100 commuter spaces on Main Campus. This shortfall must be addressed by alternative means or "trip reduction strategies".

This section describes the trip reduction strategies, and particularly planned improvements to alternative modes, that will be employed to accommodate the commuting needs of the Development Plan. The projected impacts and use of each alternative mode also are quantified.

It is important to note that impacts of the COVID-19 pandemic have reshaped the workplace. A sustained rise in remote work and learning has impacted parking and transportation demands, as evidenced in data collected for this TIA update.

3.2.1 Approach to Estimating Use of Alternatives Modes

The December 2023 TIA has been updated based on new population projections, more recent survey data, and counts to refine what modes the Development Plan commuters and the overall commuting population would use (often referred to as the "mode split"). As noted earlier, the trip reduction measures are aimed at the entire commuting population of the campus (existing and future), and not just the new commuters.

The results of the revised mode split analysis are summarized in Table 3-2. The analysis initially, hypothetically, assumes that the trip reduction measures that are implicit in the Development Plan and needed to address the reduced parking apply only to new commuters. In reality they will apply to all commuters since all parking is pooled and there will be no distinction between new and existing commuters. The final columns show the aggregate mode split for all campus commuters. The assumptions and explanations for the calculations are shown in the footnotes to the table.

This table has appeared in all previous updates and has been adjusted based on the findings of the 2019 Commuter Survey and population projections to 2024. Table 3-3 shows a comparison of mode splits from the 2001, 2004, 2007, 2009, 2011, 2013, 2015, 2017, and 2019 surveys, as well as the projected mode split. The 2019 survey provides a snapshot of progress part way into the Development Plan, which was used to adjust the projected utilization of some of the modes.

Table 3-2: Estimated Mode Splits for New Main Campus Commuters

	New Employees[1]				New Commuting Students[1]				Total New Commuters[1]			Total All Commuters[1]	
Number	*8,203*				*3,862*				*12,065*			*21,219*	*21,490*
	Existing (2001) Ratios		*New Ratios*		*Existing (2001) Ratios*		*New Ratios*		*Number*[4]			*Ratios*	
	Ratio[2]	*Number*[4]	*Ratio*[3]	*Number*[4]	*Ratio*[2]	*Number*[4]	*Ratio*[3]	*Number*[4]	*Existing Ratios*	*New Ratios*	*Ratio*	*Employees*	*Students*
Drive alone[5]	0.72	5,882	0.01	112	0.19	734	0.00	0	6,615	112	0.01	0.45	0.16
Drive carpool/vanpool[6]	0.02	186	0.04	332	0.03	103	0.03	103	289	435	0.04	0.03	0.03
Rideshare (passengers only - carpool & van)[6]	0.04	330	0.07	608	0.05	183	0.05	183	513	791	0.07	0.05	0.05
CHT[7]	0.05	394	0.32	2,656	0.33	1,274	0.65	2,529	1,668	5,186	0.43	0.15	0.39
Regional Transit[8]	0.01	121	0.32	2,621	0.01	46	0.06	233	167	2,855	0.24	0.13	0.02
Bicycle[9]	0.03	262	0.04	305	0.09	333	0.07	283	595	588	0.05	0.03	0.08
Walk[9]	0.02	150	0.02	150	0.12	481	0.06	231	631	381	0.03	0.02	0.11
Park-and-ride[10]	0.07	541	0.13	1,081	0.12	463	0.02	58	1,005	1,139	0.09	0.09	0.10
Other[11]	0.04	336	0.04	336	0.06	241	0.06	241	577	577	0.05	0.04	0.06
TOTAL	**1.00**	**8,203**	**1.00**	**8,203**	**1.00**	**3,858**	**1.00**	**3,862**	**12,061**	**12,065**	**1.00**	**1.00**	**1.00**

Notes:

1. Ratios for new commuters hypothetically assume all additional diversion to alternatives is by new commuters only. In reality, new commuters will be treated no differently than existing commuters. More existing commuters will also be required to switch to other modes of travel. Last two columns in table show final impact for all commuters. Assuming strategies apply to new commuters only also distorts needs, e.g., almost all diversion must be for employees since (a) the proportional growth in employees is much higher than students (31% versus 14%), and (b) students already use alternative modes more.
2. Existing ratios are for pre-Development Plan and based on a November 2001 commuter survey.
3. New ratios are derived from numbers in next column (i.e., projected users of a particular mode calculated first), and have been adjusted based on 2019 Commuter Survey.
4. Note that numbers are for all new commuters, and not just for number of commuters on a typical day (which is approximately 20% lower).
   Numbers should be divided to calculate users on a particular day by - 1.25
   Numbers for New Ratios include (a) growth in use of alternatives modes based on current mode split, (b) increased use resulting from strategies (adjusted for 2019 Commuter Survey).
   Current (2001) main campus employment = 13,016
   Employee growth in Development Plan = 63%
   Current (2001) commuter students = 17,628
   Commuter student growth in Development Plan = 22%
5. Current drive alone ratio includes permit parking and parking in private and Town lots.
   2001 Commuter Survey drive alone ratio for commuting students (0.33) used in previous updates exceeded permit allocation. Reduced to 0.25 and CHT increased from 0.20 to 0.28 based on 2004 Survey.
   The existing drive alone ratio was further reduced to 0.19 based on the 2011 Survey, and the CHT ratio was increased to 0.33.
   New ratio for commuting students assumes zero parking added for them. In fact, Development Plan results in net loss of 90 spaces for commuting students.
6. Commuters survey indicates average vehicle occupancy for carpools and vanpools = 2.9 Assume additional 2% of employees rideshare = 424 employees. Applying avg. veh. occupancy, this is equivalent to 146 additional rideshare vehicles (or drivers)
   Increase in ridesharing rate assumed for employees only. Therefore total new employees who rideshare are sum of (a) using existing ratios = 186 drivers, 330 passengers and (b) additional 146 drivers and 278 passengers (using avg. vehicle occupancy).
   Additional **438** empl spaces is equivalent to 548 permit holders, used accordingly:
   (Table 2-4) 186 - (existing growth ratio for rideshare drivers)
   146 - (additional rideshare vehicle drivers)
   103 - (additional student rideshare drivers)
   Therefore **112** - permits available for drive alone employees.
7. 3,518 increase in local transit use for new ratio = 2,262 employees and 1,255 students. Employee transit users for new ratio equals users with existing ratio (394) plus 2,262 X 1.25 = 3,222 new persons. Similar calculation for students.
8. Additional regional transit users (2,150) assumed to be employees (2,000) and commuting students (150). Employee users for new ratio equals users with existing ratio (121) plus 2,000 additional daily riders (or 2,000 X 1.25 = 2,621 persons). Similar calculation for students.
9. No change in ratios is assumed in for walking and "other" for employees (worst-case assumption to ensure adequate transit and park-and-ride provided). Bike usage did not change in 2019 survey; no change in target was assumed.
10. Park-and-ride estimates based on what remains after other modes addressed (ie., for employees to total 8,203 and students to total 3,682).
    This is equivalent to 134 users over and above the growth based on existing ratios, or 108 spaces.
    Total park-and-ride requirement is for 1,139 users, or **911** spaces, of which **804** represent "natural" growth.
11. Other includes dropped off, motorcycle, etc.
12. Population projections were updated in 2015 to extend to 2022.

Table 3-3: Existing and Target Mode Splits

	Employees										
Mode	2001 Ratio	2004 Ratio	2007 Ratio	2009 Ratio	2011 Ratio	2013 Ratio	2015 Ratio	2017 Ratio	2019 Ratio	2023 Ratio	New Projections
Drive alone	0.72	0.61	0.56	0.49	0.57	0.51	0.61	0.64	0.69	0.69	0.42
Carpool/vanpool	0.06	0.05	0.06	0.07	0.05	0.05	0.05	0.05	0.04	0.04	0.03
Bus	0.06	0.08	0.10	0.13	0.10	0.15	0.16	0.15	0.15	0.15	0.28
Bicycle	0.03	0.02	0.03	0.04	0.02	0.04	0.05	0.04	0.03	0.03	0.03
Walk	0.02	0.02	0.03	0.03	0.02	0.03	0.01	0.02	0.02	0.02	0.02
Park-and-ride	0.07	0.15	0.16	0.17	0.18	0.16	0.07	0.05	0.06	0.06	0.12
Other	0.04	0.06	0.07	0.07	0.05	0.07	0.05	0.04	0.01	0.01	0.09

	Commuting Students										
Mode	2001 Ratio	2004 Ratio	2007 Ratio	2009 Ratio	2011 Ratio	2013 Ratio	2015 Ratio	2017 Ratio	2019 Ratio	2023 Ratio	New Projections
Drive alone	0.33	0.19	0.18	0.17	0.14	0.16	0.18	0.25	0.25	0.25	0.15
Carpool/vanpool	0.08	0.07	0.08	0.03	0.04	0.04	0.03	0.02	0.05	0.05	0.03
Bus	0.21	0.34	0.35	0.39	0.42	0.37	0.51	0.39	0.39	0.39	0.41
Bicycle	0.09	0.05	0.06	0.11	0.10	0.08	0.13	0.13	0.06	0.06	0.08
Walk	0.12	0.14	0.14	0.12	0.11	0.15	0.05	0.09	0.16	0.16	0.11
Park-and-ride	0.12	0.16	0.10	0.14	0.15	0.12	0.06	0.06	0.08	0.08	0.10
Other	0.06	0.06	0.09	0.05	0.05	0.08	0.04	0.06	0.02	0.02	0.11

Notes
1. "Carpool/vanpool" includes drivers and passengers.
2. "Bus" includes Chapel Hill Transit and Regional Transit.
3. "Other" includes motorcycles, dropped off, rideshare, work from home, etc.
4. Existing ratios are based on Tuesday data from the Commuter Survey. 2023 existing ratios use 2019 Commuter Survey.

The following notes apply to updated Table 3-3:

- The use of alternative modes, in most cases, includes the proportion of commuters who would use those modes based on current mode split (e.g., if the number of employees increases by 31%, then use of CHT by employees can be expected to increase by 31% without expanded trip reduction strategies).

- The numbers represent all new commuters (employees and students). Using the parking oversell ratio (1.25 permits sold for every commuter space) as a guide to the number of commuters who are on campus on typical day, on a typical day approximately 20% of commuters do not come to the campus (i.e., 100 parking spaces can accommodate 125 commuters who drive and hold a permit).

Following are highlights and conclusions for the updated table:

- Drive alone continues to be well below 2001 levels for both employees and students. This can be explained by (a) a reduction in permit parking availability on Main Campus, (b) an increase in the employee and student populations in the same period, and (c) improvements to alternative modes of travel (specifically Chapel Hill Transit, fare free programs with GoTriangle and other regional transit providers, and park-and-ride).

- The survey reveals that the proportion of commuting students driving alone to campus (excluding park-and-ride) has dropped from 33% in 2001 to 18% in 2015, with an increase in 2019 to 25%, while the original projected target was 30% (only a small decrease was anticipated since the amount of commuting student parking on campus, and the projected increase in students, are both relatively low). The amount of parking available for commuting students on Main Campus, as well as the number of commuting students, has not changed significantly since the beginning of the

Development Plan to explain this drop. This suggests that the 33% derived from the 2001 survey was an over-estimate (supported by the small number of permits actually available to students in 2001, the limited amount of commuter student parking in 2001, and the 2004 commuter survey), and has been reduced to 0.19 for developing the new projections. Use of CHT was increased from 0.28 to 0.33 to balance the mode split.

- CHT ridership has increased dramatically since 2001 (refer to Section 3.2.3), for both students and employees. Employee use of transit (CHT and regional transit) has risen from approximately six percent to approximately 15 percent. This now exceeds the target of 13 percent. Since the 2013 Survey, student use has increased from 37 percent to 51 percent, and recently dropped back and stabilized at 39%.

- Carpooling and vanpooling has remained relatively constant since 2001, even with reduced parking on Main Campus.

- No increase is assumed in walking and "other" split for employees (worst-case assumption to ensure adequate transit and park-and-ride provided). For students, no increase in cycling and walking is assumed based on the fact that there are limited opportunities for additional student housing within close distance of the campus. Again, the purpose of these worst-case assumptions is to ensure that park-and-ride is not undersupplied.

Key changes in travel projections from this updated analysis include:

- With the inclusion of population projections out to 2024, the number of commuters has increased without a corresponding increase in the number of on-campus spaces available. This has led to an increased need for travel by alternative modes, particularly transit.

- The drive alone share for pre and post-Development Plan students is substantially reduced (for reasons explained above).

- The projected use of CHT and regional transit by employees has been changed to ratios of 0.15 and 0.13 respectively.

- Park-and-ride use by employees has been decreased from 0.14 in the 2011 Update to 0.12 to reflect a drop in demand for park-and-ride (possibly due to introduction of a parking fee for park-and-ride permits).

- The total park-and-ride need for the Development Plan has decreased slightly from 1,338 to 892 spaces (see Note 10 in Table 3-2).

The remainder of this section provides more detail on the alternatives.

3.2.2 Overview of Transportation Strategies

The transportation strategies that are inherent in the Development Plan are consistent with the overall transportation strategy that guided the preparation of the 2001 Main Campus Master Plan. These, in turn, reflect the objectives and recommendations that were developed in 1997/98 by a Parking and Transit Task Force. A clear theme of the Task Force was that the University should promote alternative modes of transportation

and other initiatives such as teleworking to reduce the impact of traffic and parking on the campus. Key objectives established by the Task Force included:

- To encourage a campus and Town environment that is supportive of pedestrians and other alternative modes of transportation.

- To offer affordable, flexible, and convenient transportation options that will serve the diverse lifestyles of the campus community.

- To reduce the demand for parking on Main Campus while maintaining an adequate supply for visitors.

- To develop an efficient, comprehensive transportation system to better serve the entire University community.

Key recommendations from the Task Force were to:

- Minimize traffic on Main Campus
- Create a pedestrian-oriented environment
- Minimize new parking
- Focus on alternatives:

    - transit
    - bicycles
    - ridesharing
    - park-and-ride
    - off-campus vehicle storage
    - flexible work hours
    - teleworking

Many of the transportation strategies needed to support the Master Plan and Development Plan are not new to the University. A substantial number of employees and students now use alternative forms of transportation to travel to the campus. The University is a major financial supporter of Chapel Hill Transit (CHT). The Master Plan also allows for fixed guideway transit to ultimately serve the campus. The University has participated in the development of park-and ride lots, and, in conjunction with the Town, cycling is being promoted and improvements are being made (included in the Master Plan).

The University has a full-time Transportation Demand Manager and a part-time Transportation Demand Coordinator who promote alternatives to single occupant vehicles (SOV). TDM staff coordinate local and regional commuting opportunities through the UNC Commuter Alternative Program (CAP) and promote these options by publishing and distributing a monthly electronic newsletter called “Commuter News” to Parking Coordinators and registered CAP members. Employees and students registered for CAP receive:

- Access to free one-day parking permits for S11 lots and Park-and-Ride lots

- Access to emergency ride Back (to locations within Chapel Hill or Carrboro)

- Eligibility for all contests and promotional items associated with CAP

- CAP Discount Card to local businesses
- Free annual Zipcar membership
- CAP email updates through the Commuter News publication

The University also prepares, on a regular basis, a Transportation Management Plan (TMP). The purpose of this plan is to develop and establish policies, procedures, and operating programs designed to minimize the number of single occupancy vehicle (SOV) trips to and from campus, and the traffic generated by these SOV trips, by increasing the alternative forms of transportation available to University employees and students. An update to the TMP was undertaken in December 2021.

The following key strategies and, where applicable, their projected impacts, are described below for:

- Chapel Hill Transit
- Regional transit
- Ridesharing
- Teleworking
- Cycling
- Walking
- Park-and-ride

UNC encourages carsharing, which reduces the need for individual vehicles to access campus. This service is for students, employees, and department use in conjunction with Zipcar, which is a reservation service that offers cars by the hour or the day. Zipcars are located at convenient locations across the UNC campus. Zipcar vehicles are also located across the country and around the world, and a membership from UNC is honored throughout the network of vehicles. A reasonable annual membership fee and an hourly rate are assessed for the use of the vehicles. CAP members receive a free annual membership.

While not strictly a strategy, one disincentive for parking on Main Campus will be the inevitable increase in parking fees that will be necessary to cover the cost of building and operating and maintaining new parking decks. These fee increases will discourage drive-alone commuting.

3.2.3 Chapel Hill Transit

In 2001 Chapel Hill Transit (CHT) carried less than 11,000 riders on a typical weekday. Ridership has significantly increased since CHT became entirely fare-free in early 2002. Table 3-4 shows the number of daily boardings (Board) and alightings (Exit) at Main Campus stops in 1998, 2001, 2003, 2005, 2006, 2008, 2009, 2011, 2013, 2015, 2017, 2019, and 2023. The number of daily passengers (fall) are around 12,000, a slight increase from 2001 ridership and a large decrease from recent years. The decrease in recent years could be attributed to the residual impacts of the COVID-19 pandemic on work and schooling, including alternative schedules, hybrid or variable work/school hours, and asynchronous classes.

A survey of University commuters undertaken in spring 2019 found that, among respondents, less commuters are using CHT, down from nine percent of employees to eight percent, and stagnant at 35 percent for students (refer to the previous section for a revised estimate of 2001 CHT use by students). Survey respondents were allowed to leave some questions unanswered, which have influenced the reported percentages below. Percentages reported below are representative of those who responded and not necessarily representative of the entire campus population.

The 2019 commuter survey continues to show potential for increased CHT ridership among University employees and students. Travel statistics from the survey reveal that for University employees:

- 29 percent live within five miles of work
- 69 percent drive alone to work everyday

Similar statistics for commuting student respondents show:

- 74 percent live less than five miles from campus

Geocoding of employee and student home addresses confirmed that there are still many employees, and to lesser degree, students residing within ¼ mile of a bus route still driving to campus, as indicated in Table 3-5. Figure 3-1 and Figure 3-2, respectively, show the location of residences and the population within a quarter mile of a bus route. The conclusion is that with continued improvements and marketing there is potential for many more employees, and to some degree students, to use CHT to travel to the campus.

Table 3-4: Chapel Hill Transit Daily Boardings and Alightings

Stop Location	1998		2001		2003		2005		2006		2009		2011		2013		2015		2017		2019		2023	
	Board	Exit	Board	Exit	Board	Exit	Board	Exit	Board	Exit	Board	Exit	Board	Exit	Board	Exit	Board	Exit	Board	Exit	Board	Exit	Board	Exit
Bowles Dr @ Craige Dorm	4	35	53	109	2	171	18	44	14	69	19	133	8	84	7	54	19	72	63	208	51	235	16	65
Bowles Dr @ F Parking Lot driveway			31	43	108	64	220	241	172	74	195	82	111	50	151	98	184	114	153	104	202	96	97	48
Bowles Dr @ Hinton James Tennis Courts	15	0	312	310	670	36	348	223	608	59	619	118	637	89	677	93	801	128	667	122	965	134	372	49
Bowles Dr @ Kenan-Flagler Parking Lot			105	219	0	115	9	126	2	96	5	123	3	110	3	93	2	79	3	86	6	138	4	59
Bowles Dr @ Smith Center	473	493	437	357	292	227	309	103	316	239	384	381	241	292	240	311	156	223	225	246	299	288	69	76
Cameron Av @ Dawe Hall/New East	100	165	117	168			8	66	94	88	59	78	21	5	0	13	2	9	16	14	1	4	30	98
Cameron Av @ Pittsboro St	5	74	0	61	1	72	0	46	0	46	2	97	3	137	3	88	0	57	0	44	3	72	1	26
Cameron Av @ Swain Hall	243	247	292	265	182	166	32	71	184	228	252	322	206	304	150	221	183	326	222	326	322	402	119	184
E Franklin St @ Coffee Shop	718	424	514	338	820	454	756	409	736	581	757	481	655	426	692	413	638	392	381	172	316	198	234	98
E Franklin St @ Henderson St			9	37	20	166	8	92	8	72	20	149	25	143	14	123	13	112	7	95	9	37	2	40
E Franklin St @ Planetarium	98	39	169	89	157	210	17	95	131	160	131	217	150	214	162	158	145	142	109	107	82	46	51	42
E Franklin St @ Raleigh St			21	10	16	4	30	18	19	16	20	9	18	4	18	1	24	2	15	3	6	3	9	1
E Franklin St @ Varsity Theatre			55	130	150	283	126	274	129	273	120	86	168	390	213	448	182	382	66	188	71	98	17	119
East Dr @ Jackson Cir			6	30	2	10	79	100	16	19	160	79	53	92	57	101	33	84	24	66	38	222	36	110
F Parking Lot - Family Practice Bldg	31	80	22	42	21	74	183	32	44	128	48	79	34	76	36	96	54	99	73	87	79	99	25	37
F Parking Lot - midway back to street			32	72	60	1	172	12	117	6	126	101	107	48	134	56	141	66	159	100	191	121	48	34
Manning Dr @ Craige Dorm	1	2	130	337	25	139	317	324	49	66	119	148	70	115	44	91	37	119	234	180	201	206	24	68
Manning Dr @ Hibbard Dr	34	65	171	211	81	106	132	195	92	126	244	273	243	321	203	348	139	271	85	270	129	382	42	196
Manning Dr @ Hinton James Dorm	354	835	0	2	54	389	60	211	133	350	158	463	128	423	141	437	216	520	137	368	234	614	112	241
Manning Dr @ Hospital Parking Deck			76	67	31	118	98	159	97	121	136	310	487	416	495	402	408	366	421	340	488	251	171	137
Manning Dr @ Public Safety								363	277	440	292	625	395	543	352	605	369	585	361	875	388	267	147	
Manning Dr @ West Dr (Hospital)			339	241	702	714	1102	755	1057	1052	1182	647	1298	1067	1325	1069	1082	961	889	813	614	561	241	245
Mason Farm Rd @ Ambul Care Center	17	36	22	53	67	127	116	143	81	162	72	107	308	412	302	457	334	455	447	555	476	517	207	291
Mason Farm Rd @ Odum Village			4	9	11	38	32	78	68	59	82	50	72	49	70	77	85	57	45	68	48	87	13	16
N Columbia St @ W Franklin St			55	172	107	480	160	485	123	479	118	483	164	678	162	764	140	614	120	563	159	617	49	243
Pittsboro St @ Credit Union	450	424	314	494	531	906	451	723	520	770	685	1003	764	1097	578	989	567	1000	412	856	474	814	333	475
Pittsboro St @ Newman Center	224	137	268	330	239	208	308	266	188	158	239	282	107	91	172	234	220	278	196	273	184	321	103	159
Pittsboro St @ University Dr	86	71	94	160	87	198	147	270	105	178	126	335	157	210	132	269	174	234	193	217	220	254	0	0
Raleigh St @ Alderman Dorm	19	2	24	5	6	1	18	22	3	0	3	0	12	6	9	6	13	7	11	6	15	9	22	6
Raleigh St @ Connor Dorm	71	30	244	607	83	525	57	221	44	113	30	43	24	8	26	7	37	42	73	14	28	9	23	121
Raleigh St @ Daws Library	125	132	488	146	51	127	65	137	40	69	80	25	15	28	5	1	9	7	3	22	0	1	-	-
Raleigh St @ Lewis Dorm	125	80	94	111	73	60	65	145	38	45	162	232	147	190	133	172	126	203	153	225	204	198	64	30
Raleigh St @ Mangum Dorm	99	140	86	67	35	127	46	101	55	90	60	134	60	156	73	180	58	169	58	210	88	226	24	69
Raleigh St @ Spencer Dorm	34	42	38	54	33	62	67	83	36	57	72	60	35	40	40	63	54	47	44	72	67	68	15	29
Ridge Rd @ Avery Dorm/Law School	10	1					30	47	13	10	12	64	16	21	20	19	22	31	23	20	24	60	4	7
Ridge Rd @ Ehringhaus Dorm	1115	26	556	39	559	15	366	182	423	8	618	52	582	43	400	25	508	33	552	57	559	51	230	10
Ridge Rd @ Rams Head Center								35	69	46	151	33	88	39	79	48	114	38	110	51	122	23	48	
Ridge Rd @ Stadium Dr	24	38	41	53	11	15	49	85	12	12	40	47	47	50	48	46	49	44	69	78	100	81	27	18
S Columbia St @ Abernethy Hall	275	351	153	273	522	418	441	247	387	330	427	312	531	432	538	437	560	466	547	405	595	470	244	191
S Columbia St @ Carrington Hall	553	422	452	454	1264	789	882	617	941	597	633	329	712	502	1008	432	817	402	720	335	825	408	0	0
S Columbia St @ Frat Court	365	392	204	374	369	783	417	580	342	588	393	765	416	1002	378	1009	329	1055	237	959	208	1153	117	471
S Columbia St @ Health Science Library	594	496	587	518	868	688	1132	781	1067	813	1305	992	1393	1429	1083	1157	1408	1195	1259	1116	1351	1303	860	645
S Columbia St @ Mason Farm Rd	5	24	13	29	42	190	24	137	33	105	44	189	45	236	39	180	56	199	55	195	73	257	20	54
S Columbia St @ Stinson Hall	424	766	424	912	618	1033	673	712	635	823	797	1054	1023	1100	1140	1010	1183	1110	1164	862	1348	1115	433	373
S Columbia St @ Westwood Dr	3	0	7	26	74	46	54	53	86	45	144	44	158	141	6	3	11	8	12	11	8	8	51	29
South Rd @ Coker Hall	82	27	80	76	208	73	235	56	120	55	156	23	144	217	115	161	85	115	93	92	113	182	96	112
South Rd @ County Club Rd			104	155	65	56	104	210	185	245	191	264	185	223	170	261	146	241	119	205	128	247	44	62
South Rd @ Fetzer Gym	336	186	27	204	876	268	502	136	625	232	616	301	588	448	574	385	489	350	393	333	454	462	249	164
South Rd @ Kenan Labs	2	192	28	150	20	201	13	205	15	203	6	172	30	71	5	37	5	39	9	32	8	30	5	39
South Rd @ Raleigh St	2	14	41	89	45	305	51	229	48	657	137	737	80	576	69	511	90	606	109	609	160	721	14	108
South Rd @ Student Stores	945	448	189	124	1250	889	814	599	988	832	1120	991	938	483	1009	628	1166	649	1005	527	1384	580	503	250
South Rd @ Woollen Gym			48	41	31	6	46	19	50	9	8	6	13	41	8	15	6	8	9	14	6	11	3	6
Stadium Dr @ Carmichael Dorm			5	3			60	13	7	2	4	3	9	13	7	3	4	8	3	3	4	2	-	-
Stadium Dr @ Ridge Rd	41	98	24	87	53	94	52	100	48	87	26	73	37	64	43	59	44	78	37	72	68	91	23	37
Stadium Dr @ Stadium Gate 2	43	34	29	34	19	42	41	48	24	43	28	53	34	55	31	48	33	51	23	36	47	57	7	16
West Dr @ Mason Farm Rd	2	1	15	16	43	27	71	60	53	45	114	272	0	0	0	0	0	0	0	0	0	0	-	-
Totals	**8,147**	**7,069**	**7,708**	**9,045**	**11,654**	**12,316**	**11,613**	**11,386**	**11,819**	**12,136**	**13,788**	**14,312**	**14,170**	**15,401**	**13,740**	**14,790**	**13,940**	**14,808**	**12,765**	**13,452**	**14,659**	**15,127**	**5,793**	**6,199**

Table 3-5: Potential Commuter Ridership for Chapel Hill Transit

		Residence Within 1/4 Mile of Bus Route, and			Residence Outside 1/4 Mile of Bus Route, and	
	Total Population in Chapel Hill/Carrboro[1]	Within 0.5 Mile Radius from Bell Tower	Within 0.5 - 2.0 Mile Radius from Bell Tower	Within 2.0 - 5.0 Mile Radius from Bell Tower	Within 0.5 - 2.0 Mile Radius from Bell Tower	Within 2.0 - 5.0 Mile Radius from Bell Tower
STUDENTS						
Population	**6,999**	890	4,169	1,673	68	1,063
Transit use based on 2019 survey:						
- percent			39.00%	39.00%		
- number of students			1,973	652		
Drive alone based on 2019 survey:						
- percent			25.00%	25.00%		
- number of students			1,265	418		
Potential New Transit Riders based on Drive Alone (50%)[2]			***0: ineligible for permit***	***209***		
EMPLOYEES						
Population:						
- Hospitals	**1,039**	37	413	481	30	487
- University	**6,630**	145	2,944	2,347	294	2,445
Total	**7,669**	**182**	**3,357**	**2,828**	**324**	**2,932**
Transit use based on 2019 survey:						
- percent			15.00%	15.00%		
- number of employees			531	424		
Drive alone based on 2017 survey:						
- percent			69.00%	69.00%		
- number of employees			2,442	1,951		
Potential New Transit Riders based on Drive Alone (40%)[2]			***977***	***781***		

Notes:

1. Population and residence data are for 2019. Address location based on geocoding in GIS. Chapel Hill/Carrboro population represents addresses within the two town limits.
2. Percent transit riders from 2019 University commuter survey. Population in 0 to 0.5 mile are subtracted since these people are unlikely to use transit.
   Potential new riders assumes drive alone commuters drive alone at least 50% of days.
   New ridership assumes 50% of eligible drive-alone students and 40% of drive-alone employees are diverted to transit with fare free and service improvements.
   Ridership would be higher if employee and student growth were considered (assuming similar proportion live in Chapel Hill/Carrboro).
3. Low student sample size and omitted responses in the 2019 commuter survey may negatively affect estimated transit ridership.

Figure 3-1: Distribution of Employee and Commuting Student Home Addresses in Chapel Hill and Carrboro

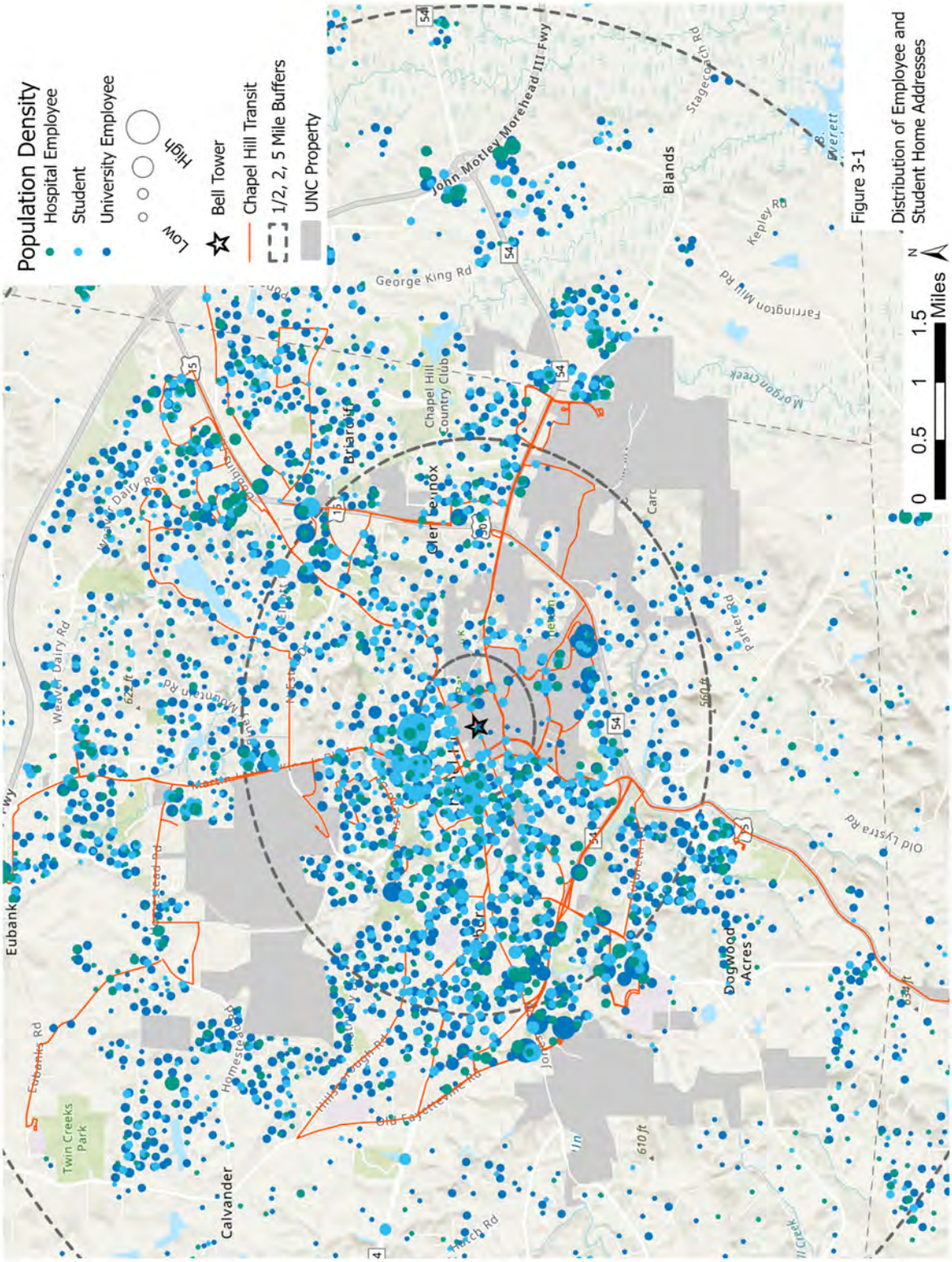
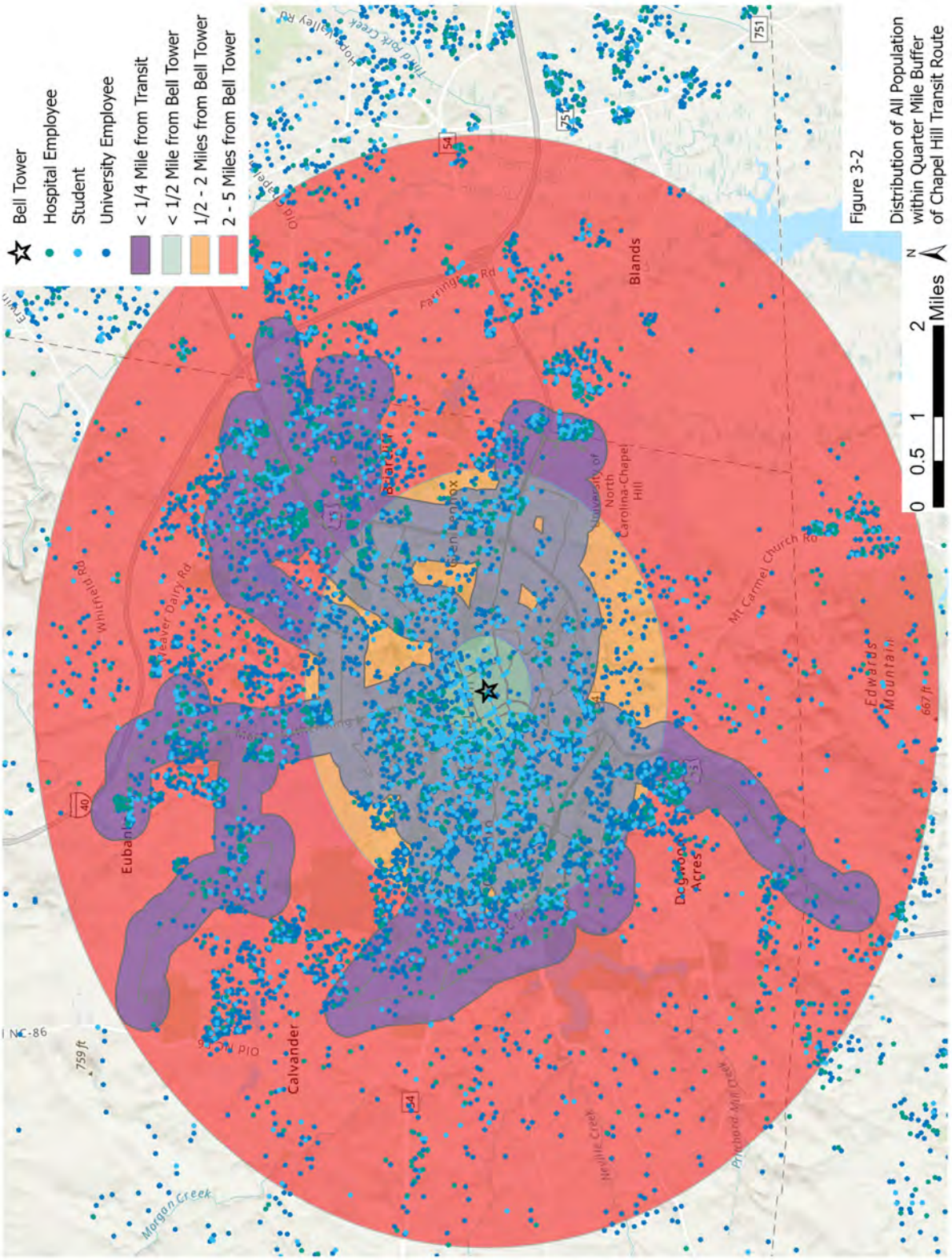


Figure 3-2: Distribution of All Population in Quarter Mile Buffer of CHT Bus Route



Chapel Hill Transit has installed global positioning systems on all vehicles, utilizing the Next Bus company's patented technology. Now riders can look on the internet or at signs installed at several bus stops, to see predicted bus arrival times in real time for the next few vehicles coming to their stop. Future improvements will be implemented as additional campus needs are identified, and in conjunction with the Towns of Chapel Hill and Carrboro. The University is committed to work with the towns in progressively moving forward with additional transit improvements such as extended hours and improved frequency. With the introduction of fare-free transit in 2002, the University has now increased its contribution to CHT to approximately $10.12 million for FY23.

The University also continues to support Town of Chapel Hill initiatives to improve bus running times. This can include traffic signal priority (where equipment on the bus is used to electronically transmit a message to the signal as the bus approaches to give that direction the next green light), queue jump lanes at congested intersections, and busway lanes or treatments. Also, the University supports the purchase of state-of-the-art technology buses as the CHT fleet is replaced or expanded. New innovations include low floor vehicles and hybrid (electric-diesel) propulsion that allows buses to operate on quiet, pollution-free electric motors in areas where there are a lot of people.

As indicated above, CHT use by University commuters has already increased significantly. However, based on the 2019 commuter survey and geocoding of home addresses, Table 3-5 shows that, as of this most recent survey date, there are more employees and students who could use it. The greatest potential is with employees, as evidenced by the continuing trend of employees driving less and using transit and park and ride more. Asynchronous learning and other remote work and school opportunities are likely to continue to impact the use of transit for commuting to campus.

3.2.4 Regional Transit

GoTriangle operates 13 routes (plus RTP shuttles) serving Chapel Hill, Durham, Raleigh, Hillsborough, Cary, Apex, Garner, Wake Forest, Knightdale, Wendell, Zebulon, Research Triangle Park (RTP), and RDU Airport. Saturday routes and shuttle services serve Chapel Hill, Durham, RTP, Raleigh, Cary, and RDU Airport. There is direct service to the campus from Durham, Raleigh (CRX), and Hillsborough (Route 420, operated by CHT). Most buses run every 30 minutes during the peak period in Chapel Hill, Durham, RTP, and Raleigh. GoTriangle maintains online trip planners at gotriangle.org and through Google Transit at transit.google.com. Other improvements planned by GoTriangle include better timing of routes with local services and continued investigation of regional transit improvements to meet future regional needs.

In fall 2015 the University expanded regional transit opportunities for its commuters. The PX route, formerly operated by Chapel Hill Transit, is now operated by Chatham Transit Network (CTN). As with CHT, the University and Chatham County subsidize fares so commuters ride to UNC at no cost. Transit passes are also available to University employees, faculty, and students for CTN's CT Express route. The University entered into agreement with Piedmont Authority for Regional Transit (PART) to accept GoPasses for UNC commuters traveling from Guilford and Alamance counties to campus.

Counts provided by GoTriangle show that an estimated 250 commuters used GoTriangle in 2001. Over 3,000 University employees, faculty, and students held a GoPass, 219 have a PART Xpass, and 219 have a Chatham GoPass as of 2019.

3.2.5 Ridesharing

The 2019 commuter survey showed similar rates of ridesharing for both employees and students (see Table 3-3).

The University introduced a number of measures to encourage ridesharing (car/vanpooling), including preferential parking and emergency rides home or to park-and-ride lots. A major focus of the TDM manager is to increase ridesharing. Ridesharing is included as part of the Commuter Alternative Program (CAP) and so people who register to car or vanpool to work receive all of the incentives included in CAP. Vanpoolers get a reserved space and a $330 subsidy toward the monthly cost of vanpooling. As of 2015, temporary employees paid by the University or Hospitals are also eligible for the $330 monthly vanpool subsidy.

The CAP offers one ridesharing service, SharetheRideNC, to allow potential vanpool participants a mechanism to match up with others wishing to commute from the same areas. SharetheRideNC is a free statewide website that was created to help form carpools and vanpools to improve air quality by reducing SOV trips.

The projected ratio for 2019 has been maintained. Over time, this mode can be expected to become more popular as gasoline prices increase and more employees live outside of Chapel Hill. Therefore, the projections from previous Updates have been retained, with additional 659 employees and 202 students on a typical day using this mode.

3.2.6 Teleworking

Title 25 of the North Carolina Administrative Code (25 NCAC 1c.0801-.0813) provides guidelines and requirements for State teleworking programs. It was adopted by the State Legislature effective April 1, 2001. The goal is to replace 20 percent of state employees' commuting miles with telework, without reducing hours worked or productivity. In addition to the environmental and traffic congestion benefits, an explicit objective of the program is to assist in recruiting and retaining employees. The state has appointed a full-time teleworking coordinator to manage the program and assist state agencies in establishing programs.

Some University employees already telework. The University supports teleworking as a trip and parking reduction strategy, and it is an element of its Transportation Demand Management (TDM) program. However, for the purpose of this study, no increase in teleworking is assumed. The Commuter Alternative Program (CAP) will soon provide benefits to those who telework/work-from-home.

3.2.7 Cycling

Bicycles are an important means of travel on and to the Main Campus. The climate, topography for parts of the campus and surrounding areas, and relatively short trips make cycling a viable travel option for many students and employees.

The 2019 Commuter Survey shows that cycling as the primary way to commute to campus has remained steady for employees (between 4 and 3 percent) and declined for commuting students (6 percent) since 2017. Both levels are average for the lifetime of the commuter survey.

Bicycle (and pedestrian) counts were undertaken in November 2023 at the same locations and same day of the week as for previous TIAs. The locations are identified in Figure 3-3, and the counts summarized in Table 3-6. Counts were taken between 7:00 A.M. and 7:00 P.M. on a Tuesday, Wednesday or Thursday. The counts included cyclists crossing the street in the general area or using the sidewalks.

A comparison of the 2001 and 2023 counts is included in the lower portion of Table 3-6. The counts run with the commuter survey results, with decreased counts in many locations, but some locations with significant increases.

There are a number of existing bicycle lanes (or wide outside lanes or shared lane markings) or paths on and around Main Campus, including:

- Cameron Avenue (Pittsboro Street to Merritt Mill Road)
- Pittsboro Street between Cameron Street and Manning Drive (one-way southbound)
- Country Club Road
- Raleigh Road (Bypass to Country Club Road)
- Martin Luther King Jr Boulevard
- South Columbia Street
- Skipper Bowles Drive
- Ridge Road

Chapel Hill, Carrboro, and the University strongly support cycling. Adopted plans for both towns include new bicycle facilities to be implemented as funding becomes available. The purpose is to ultimately develop a network of interconnected bike routes and paths, including improved access to the Main Campus and downtowns. The Town of Chapel Hill also has published a bicycle plan, based on the goal of promoting and encouraging bicycling as an alternative means of transportation to lessen traffic congestion, air pollution, and the demand for expanded parking and roadways. In 2014 UNC developed a Campus Bicycle Master Plan at the same time the Town of Chapel Hill was developing its Bicycle Master Plan. The University was subsequently awarded the Silver designation as a Bicycle Friendly University by the League of American Bicyclists for its work to improve bicycling on campus. In addition, the University launched the Tar Heel Bikes bikeshare program in fall 2017, with 100 bikes and 18 hubs across campus. The program has been extremely successful and opportunities for future growth of the program are being investigated.

As part of the Master Plan development, a bicycle plan advisory group consisting of representatives from the University and the towns was convened to discuss campus needs, and to identify potential bike routes. The group formulated the following Main Campus biking mission:

> *To design efficient bicycle transit routes which are safe for bicyclists and pedestrians; to develop adequate bicycle parking facilities, educational programs, and enforcement; to implement policies and incentives to support transportation by bicycle; and to develop architectural guidelines for buildings which include attention to showers and clothing storage for bicycle commuters.*

The overall goal is to encourage more cycling, to improve safety for cyclists, and in particular, to cater to the inexperienced or uninitiated cyclist.

Figure 3-3: Bicycle and Pedestrian Count Locations

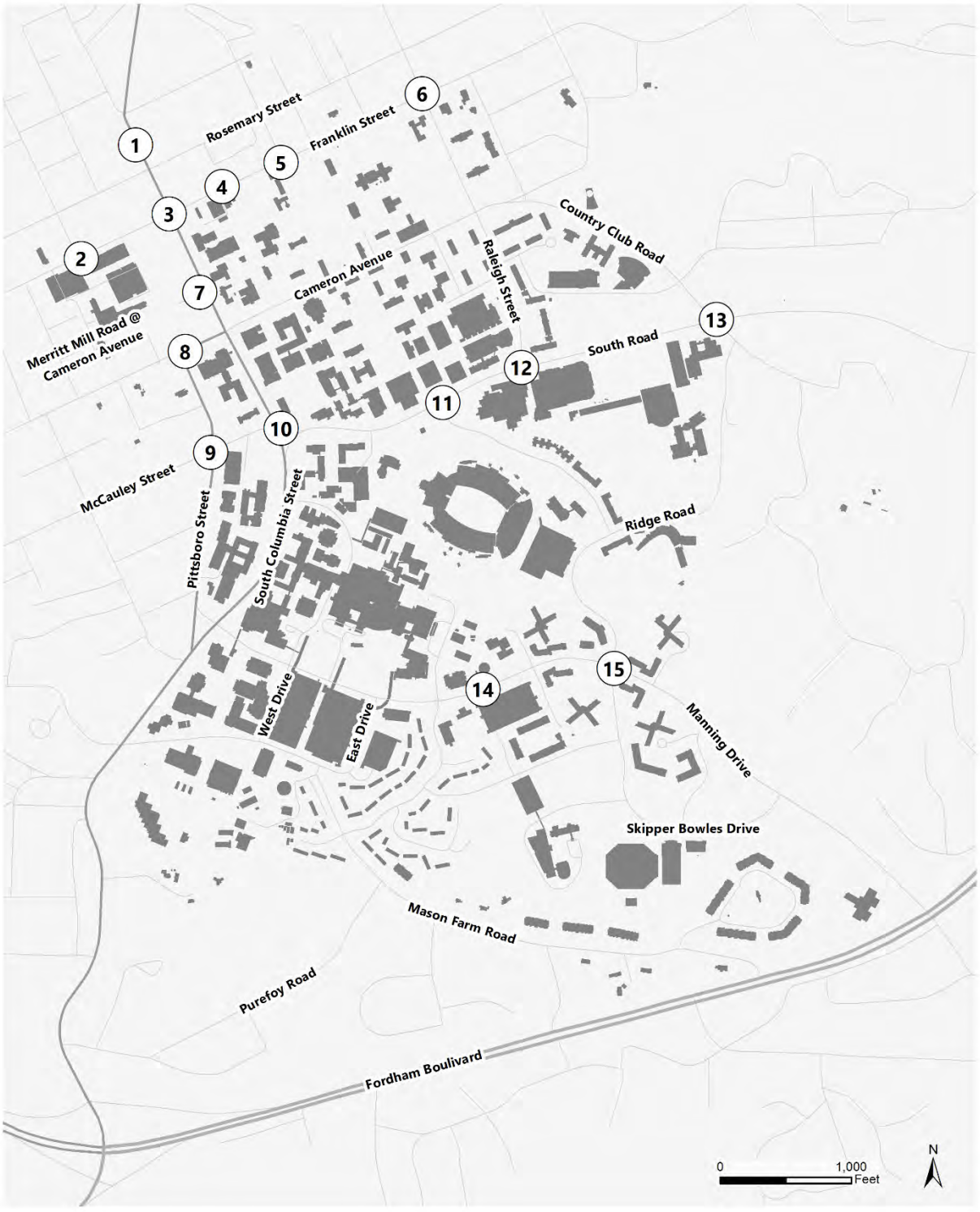


Table 3-6: Bicycle Counts

Location	2001								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	31	25	318	Not applicable			Not applicable		
2. Franklin Street and Church Street	7	13	44	10	23	231	3	5	44
3. Franklin Street and North Columbia Street	40	20	358	16	20	360	11	6	80
4. Franklin Street at Coffee Shop	4	9	66	14	14	181	Not applicable		
5. Franklin Street and Henderson Street	7	11	117	7	11	96	3	2	22
6. Franklin Street and Hillsborough-Raleigh Street	9	9	119	6	8	80	5	5	43
7. Columbia Street at Fraternity Court	25	19	336	6	10	106	Not applicable		
8. Cameron Avenue and Pittsboro Street	2	5	32	69	53	872	9	4	62
9. McCauley Street and Pittsboro Street	18	10	134	30	22	239	9	20	148
10. McCauley Street/South Road and Columbia Street	19	23	272	26	20	251	8	17	179
11. South Road at Bell Tower/Stadium Drive	35	30	502	19	25	360	6	5	42
12. Raleigh Street and South Road	13	11	177	16	14	209	11	11	139
13. Country Club Road and South Road	4	5	56	6	9	67	8	7	102
14. Manning Drive at Craige Deck	9	9	91	6	4	45	2	8	24
15. Manning Drive and Ridge Road	25	28	293	5	9	63	3	4	37

Location	2003								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	24	25	206	Not applicable			Not applicable		
2. Franklin Street and Church Street	2	1	9	18	27	195	5	11	75
3. Franklin Street and North Columbia Street	13	24	169	18	23	181	6	9	67
4. Franklin Street at Coffee Shop	6	9	57	13	21	166	Not applicable		
5. Franklin Street and Henderson Street	8	5	45	9	8	60	5	5	37
6. Franklin Street and Hillsborough-Raleigh Street	14	13	92	7	10	70	5	5	38
7. Columbia Street at Fraternity Court	35	41	303	12	13	113	Not applicable		
8. Cameron Avenue and Pittsboro Street	0	0	0	64	50	539	17	11	116
9. McCauley Street and Pittsboro Street	19	15	54	4	11	83	14	9	80
10. McCauley Street/South Road and Columbia Street	16	18	123	18	19	143	10	22	131
11. South Road at Bell Tower/Stadium Drive	18	16	138	19	22	152	14	16	100
12. Raleigh Street and South Road	10	12	61	29	15	130	12	13	104
13. Country Club Road and South Road	3	9	42	6	7	40	26	5	83
14. Manning Drive at Craige Deck	5	6	29	7	6	33	3	2	12
15. Manning Drive and Ridge Road	14	17	102	4	11	58	2	3	19

Location	2005								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	30	29	218	Not applicable			Not applicable		
2. Franklin Street and Church Street	1	5	16	19	32	196	11	14	82
3. Franklin Street and North Columbia Street	26	30	198	18	26	168	10	14	93
4. Franklin Street at Coffee Shop	5	12	58	12	21	134	Not applicable		
5. Franklin Street and Henderson Street	12	10	63	6	12	57	2	4	14
6. Franklin Street and Hillsborough-Raleigh Street	13	10	63	10	6	38	5	4	18
7. Columbia Street at Fraternity Court	37	43	296	7	5	29	Not applicable		
8. Cameron Avenue and Pittsboro Street	0	0	0	49	95	460	24	17	118
9. McCauley Street and Pittsboro Street	15	13	82	19	16	135	13	12	81
10. McCauley Street/South Road and Columbia Street	10	20	108	23	15	131	15	22	154
11. South Road at Bell Tower/Stadium Drive	0	2	2	14	10	86	1	0	1
12. Raleigh Street and South Road	18	15	114	9	15	65	10	11	62
13. Country Club Road and South Road	5	10	38	11	10	50	10	13	62
14. Manning Drive at Craige Deck	9	9	69	6	6	30	2	8	27
15. Manning Drive and Ridge Road	21	28	182	19	19	145	9	4	36

Location	2007								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	27	33	197	Not applicable			Not applicable		
2. Franklin Street and Church Street	4	9	51	21	26	181	11	13	85
3. Franklin Street and North Columbia Street	40	34	254	22	27	220	15	13	106
4. Franklin Street at Coffee Shop	10	15	96	0	11	45	Not applicable		
5. Franklin Street and Henderson Street	2	3	24	13	32	138	3	3	19
6. Franklin Street and Hillsborough-Raleigh Street	14	9	101	4	19	78	7	7	42
7. Columbia Street at Fraternity Court	27	32	214	1	1	5	Not applicable		
8. Cameron Avenue and Pittsboro Street	0	3	11	105	122	768	27	15	173
9. McCauley Street and Pittsboro Street	21	17	125	32	26	214	29	19	120
10. McCauley Street/South Road and Columbia Street	11	12	75	2	12	51	12	12	92
11. South Road at Bell Tower/Stadium Drive	65	70	605	27	25	301	46	72	562
12. Raleigh Street and South Road	3	27	33	24	5	166	21	25	116
13. Country Club Road and South Road	4	11	45	11	12	48	11	10	63
14. Manning Drive at Craige Deck	22	21	171	3	5	38	9	13	84
15. Manning Drive and Ridge Road	29	29	215	27	31	208	4	4	27

* Represents cyclists who turned the corner and did not cross the street.
Counts were taken in during the Fall of 2011 while the University was in session. The peaks summarized are the bicycle peak periods and do not necessarily coincide with vehicle peak hours.

Table 3-6: Bicycle Counts (cont.)

Location	2009								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	38	40	221	Not applicable			Not applicable		
2. Franklin Street and Church Street	3	0	15	20	37	209	19	10	102
3. Franklin Street and North Columbia Street	42	32	254	23	36	235	27	23	178
4. Franklin Street at Coffee Shop	0	2	4	0	0	0	Not applicable		
5. Franklin Street and Henderson Street	0	0	0	0	0	0	0	0	0
6. Franklin Street and Hillsborough-Raleigh Street	11	21	134	11	9	75	10	2	62
7. Columbia Street at Fraternity Court	44	39	339	0	8	12	Not applicable		
8. Cameron Avenue and Pittsboro Street	2	0	12	152	146	1,048	69	44	419
9. McCauley Street and Pittsboro Street	79	46	368	10	15	77	47	23	269
10. McCauley Street/South Road and Columbia Street	10	34	194	32	21	198	15	24	179
11. South Road at Bell Tower/Stadium Drive	74	93	825	22	32	251	65	17	197
12. Raleigh Street and South Road	4	0	9	17	19	136	29	33	270
13. Country Club Road and South Road	6	12	43	9	6	59	7	19	83
14. Manning Drive at Craige Deck	14	19	159	11	10	60	14	12	89
15. Manning Drive and Ridge Road	31	22	181	23	25	219	1	0	26

Location	2011								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	23	32	192	Not applicable			Not applicable		
2. Franklin Street and Church Street		**			**			**	
3. Franklin Street and North Columbia Street	48	43	236	21	26	210	14	27	150
4. Franklin Street at Coffee Shop	2	9	57	15	17	104	Not applicable		
5. Franklin Street and Henderson Street	7	24	141	15	23	147	3	11	55
6. Franklin Street and Hillsborough-Raleigh Street	12	14	93	1	16	70	6	13	53
7. Columbia Street at Fraternity Court	32	44	309	5	9	77	Not applicable		
8. Cameron Avenue and Pittsboro Street	0	1	2	151	95	851	10	8	111
9. McCauley Street and Pittsboro Street	19	13	134	49	41	251	26	28	189
10. McCauley Street/South Road and Columbia Street	22	26	195	31	22	189	16	14	121
11. South Road at Bell Tower/Stadium Drive	3	50	109	22	14	222	11	0	50
12. Raleigh Street and South Road	31	15	186	13	18	149	31	36	310
13. Country Club Road and South Road	0	5	17	4	6	34	7	5	36
14. Manning Drive at Craige Deck	26	16	137	4	5	20	5	5	43
15. Manning Drive and Ridge Road	26	31	222	36	24	225	0	1	8

Location	2013								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	29	26	186	Not applicable			Not applicable		
2. Franklin Street and Church Street	11	4	45	8	14	134	18	15	92
3. Franklin Street and North Columbia Street	39	23	186	13	15	129	16	12	129
4. Franklin Street at Coffee Shop	10	9	65	7	10	88	Not applicable		
5. Franklin Street and Henderson Street	4	10	49	7	13	64	3	3	24
6. Franklin Street and Hillsborough-Raleigh Street	12	10	91	7	9	56	5	6	42
7. Columbia Street at Fraternity Court	43	63	446	4	8	51	Not applicable		
8. Cameron Avenue and Pittsboro Street	7	7	70	130	28	492	27	90	418
9. McCauley Street and Pittsboro Street	10	6	89	36	38	285	39	29	256
10. McCauley Street/South Road and Columbia Street	13	34	161	34	19	267	36	23	263
11. South Road at Bell Tower/Stadium Drive	59	67	405	31	21	289	33	27	364
12. Raleigh Street and South Road	7	7	49	38	34	279	22	21	177
13. Country Club Road and South Road	4	7	27	5	7	34	7	3	30
14. Manning Drive at Craige Deck	23	17	126	10	3	37	2	3	25
15. Manning Drive and Ridge Road	32	25	221	38	30	256	3	9	39

Location	2015								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	19	20	140	Not applicable			Not applicable		
2. Franklin Street and Church Street	0	1	8	8	18	141	14	8	89
3. Franklin Street and North Columbia Street	19	17	151	18	16	123	17	12	97
4. Franklin Street at Coffee Shop	4	12	63	8	5	36	Not applicable		
5. Franklin Street and Henderson Street	12	8	73	5	9	56	3	2	18
6. Franklin Street and Hillsborough-Raleigh Street	13	9	65	12	6	51	4	0	11
7. Columbia Street at Fraternity Court	34	31	302	6	25	89	Not applicable		
8. Cameron Avenue and Pittsboro Street	0	1	3	111	72	589	25	5	91
9. McCauley Street and Pittsboro Street	15	6	70	41	33	276	37	9	148
10. McCauley Street/South Road and Columbia Street	39	39	299	18	22	168	12	15	101
11. South Road at Bell Tower/Stadium Drive	53	1	265	28	37	253	25	36	298
12. Raleigh Street and South Road	14	12	129	18	16	158	10	3	23
13. Country Club Road and South Road	4	6	26	9	10	52	4	5	44
14. Manning Drive at Craige Deck	18	13	123	9	5	45	4	1	14
15. Manning Drive and Ridge Road	27	26	194	26	24	198	3	3	19

Table 3-6: Bicycle Counts (cont.)

Location	2017								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	15	32	174	Not applicable			Not applicable		
2. Franklin Street and Church Street	2	1	5	2	5	15	2	9	21
3. Franklin Street and North Columbia Street	54	26	181	21	54	288	22	18	174
4. Franklin Street at Coffee Shop	7	15	63	20	20	88	Not applicable		
5. Franklin Street and Henderson Street	6	7	51	5	5	27	2	2	13
6. Franklin Street and Hillsborough-Raleigh Street	13	5	65	4	8	32	2	7	35
7. Columbia Street at Fraternity Court	5	3	15	29	37	226	Not applicable		
8. Cameron Avenue and Pittsboro Street	1	2	8	135	84	605	20	12	107
9. McCauley Street and Pittsboro Street	19	12	110	47	35	267	26	22	197
10. McCauley Street/South Road and Columbia Street	10	14	81	25	32	190	10	13	78
11. South Road at Bell Tower/Stadium Drive	50	53	461	28	30	257	59	63	500
12. Raleigh Street and South Road	12	8	125	14	16	150	8	13	32
13. Country Club Road and South Road	5	5	25	2	3	12	3	4	21
14. Manning Drive at Craige Deck	9	5	37	1	3	13	1	2	7
15. Manning Drive and Ridge Road	14	15	108	23	26	184	1	4	10

Location	2019								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	9	8	62	Not applicable			Not applicable		
2. Franklin Street and Church Street	20	11	109	13	20	135	15	5	71
3. Franklin Street and North Columbia Street	20	32	197	13	31	180	16	13	100
4. Franklin Street at Coffee Shop	4	11	46	12	18	116	Not applicable		
5. Franklin Street and Henderson Street	11	13	52	5	5	39	0	0	10
6. Franklin Street and Hillsborough-Raleigh Street	11	9	65	7	7	44	3	4	26
7. Columbia Street at Fraternity Court	33	40	246	12	8	57	Not applicable		
8. Cameron Avenue and Pittsboro Street	1	0	21	120	101	650	24	15	149
9. McCauley Street and Pittsboro Street	13	7	117	31	44	226	14	15	84
10. McCauley Street/South Road and Columbia Street	38	27	214	30	36	255	6	28	134
11. South Road at Bell Tower/Stadium Drive	42	39	332	19	20	202	29	29	264
12. Raleigh Street and South Road	3	16	89	12	18	80	19	7	98
13. Country Club Road and South Road	1	5	21	8	3	26	8	5	48
14. Manning Drive at Craige Deck	15	17	109	6	4	26	2	2	17
15. Manning Drive and Ridge Road	27	34	207	21	23	156	5	0	15

Location	2023								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	31	35	212	Not applicable			Not applicable		
2. Franklin Street and Church Street	14	19	138	26	39	270	17	8	107
3. Franklin Street and North Columbia Street	30	23	226	18	15	195	16	15	99
4. Franklin Street at Coffee Shop	2	15	50	11	19	112	Not applicable		
5. Franklin Street and Henderson Street	7	4	32	4	4	33	3	0	34
6. Franklin Street and Hillsborough-Raleigh Street	21	14	107	5	6	43	4	2	25
7. Columbia Street at Fraternity Court	17	4	118	18	13	84	Not applicable		
8. Cameron Avenue and Pittsboro Street	1	4	23	88	83	703	31	23	211
9. McCauley Street and Pittsboro Street	22	14	141	29	32	234	26	21	155
10. McCauley Street/South Road and Columbia Street	22	26	207	59	41	334	4	30	149
11. South Road at Bell Tower/Stadium Drive	27	56	289	34	44	327	76	27	508
12. Raleigh Street and South Road	14	17	115	24	21	166	30	18	214
13. Country Club Road and South Road	1	8	18	1	8	39	4	4	26
14. Manning Drive at Craige Deck	16	17	141	6	6	40	3	6	37
15. Manning Drive and Ridge Road	20	29	205	16	16	136	2	3	39

Location	2001-2023 Percent Change								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	0%	40%	-33%	Not applicable			Not applicable		
2. Franklin Street and Church Street	100%	46%	214%	160%	70%	17%	467%	60%	143%
3. Franklin Street and North Columbia Street	-25%	15%	-37%	13%	-25%	-46%	45%	150%	24%
4. Franklin Street at Coffee Shop	-50%	67%	-24%	-21%	36%	-38%	Not applicable		
5. Franklin Street and Henderson Street	0%	-64%	-73%	-43%	-64%	-66%	0%	-100%	55%
6. Franklin Street and Hillsborough-Raleigh Street	133%	56%	-10%	-17%	-25%	-46%	-20%	-60%	-42%
7. Columbia Street at Fraternity Court	-32%	-79%	-65%	200%	30%	-21%	Not applicable		
8. Cameron Avenue and Pittsboro Street	-50%	-20%	-28%	28%	57%	-19%	244%	475%	240%
9. McCauley Street and Pittsboro Street	22%	40%	5%	-3%	45%	-2%	189%	5%	5%
10. McCauley Street/South Road and Columbia Street	16%	13%	-24%	127%	105%	33%	-50%	76%	-17%
11. South Road at Bell Tower/Stadium Drive	-23%	87%	-42%	79%	76%	-9%	1167%	440%	1110%
12. Raleigh Street and South Road	8%	55%	-35%	50%	50%	-21%	173%	64%	54%
13. Country Club Road and South Road	-75%	60%	-68%	-83%	-11%	-42%	-50%	-43%	-75%
14. Manning Drive at Craige Deck	78%	89%	55%	0%	50%	-11%	50%	-25%	54%
15. Manning Drive and Ridge Road	-20%	4%	-30%	220%	78%	116%	-33%	-25%	5%

* Represents cyclists who turned the corner and did not cross the street.

** Location not counted in 2011 to due to construction.

Counts were taken in during the Fall while the University was in session. The peaks summarized are the bicycle peak periods and do not necessarily coincide with vehicle peak hours.

Table 3-7: Pedestrian Counts

Location	2001								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	95	78	1,139	Not applicable			Not applicable		
2. Franklin Street and Church Street	50	96	647	90	158	2,313	9	10	108
3. Franklin Street and North Columbia Street	217	337	4,101	236	437	5,534	57	70	830
4. Franklin Street at Coffee Shop	247	439	4,422	272	280	4,468	Not applicable		
5. Franklin Street and Henderson Street	244	440	4,389	130	166	2,281	31	49	472
6. Franklin Street and Hillsborough-Raleigh Street	54	87	948	26	28	420	19	31	387
7. Columbia Street at Fraternity Court	131	311	2,914	403	454	4,126	Not applicable		
8. Cameron Avenue and Pittsboro Street	14	29	344	216	274	2,741	23	12	211
9. McCauley Street and Pittsboro Street	37	56	754	90	108	1,524	28	40	450
10. McCauley Street/South Road and Columbia Street	139	242	2,124	47	78	971	71	60	838
11. South Road at Bell Tower/Stadium Drive	784	708	10,064	187	200	2,701	73	50	496
12. Raleigh Street and South Road	334	331	4,197	121	105	1,448	75	41	646
13. Country Club Road and South Road	23	64	537	33	46	495	115	75	1,238
14. Manning Drive at Craige Deck	65	61	964	12	53	332	20	20	191
15. Manning Drive and Ridge Road	293	423	4,963	79	192	2,020	20	18	288

Location	2003								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	115	141	1,083	Not applicable			Not applicable		
2. Franklin Street and Church Street	26	50	313	178	277	2,069	18	51	275
3. Franklin Street and North Columbia Street	329	606	4,088	407	747	5,145	107	107	890
4. Franklin Street at Coffee Shop	336	638	3,818	472	849	5,891	Not applicable		
5. Franklin Street and Henderson Street	386	719	4,263	139	346	2,118	85	93	797
6. Franklin Street and Hillsborough-Raleigh Street	96	131	984	40	66	499	24	55	382
7. Columbia Street at Fraternity Court	343	503	3,369	731	590	4,907	Not applicable		
8. Cameron Avenue and Pittsboro Street	15	27	131	257	313	2,357	45	87	601
9. McCauley Street and Pittsboro Street	86	86	627	79	108	801	53	66	552
10. McCauley Street/South Road and Columbia Street	336	367	2,485	77	97	807	117	143	1,169
11. South Road at Bell Tower/Stadium Drive	1,550	1,872	17,216	220	264	2,417	728	386	4,573
12. Raleigh Street and South Road	157	288	1,761	284	281	2,373	51	68	548
13. Country Club Road and South Road	23	58	330	65	85	563	55	99	591
14. Manning Drive at Craige Deck	318	311	2,473	94	166	1,090	47	62	366
15. Manning Drive and Ridge Road	410	580	4,171	216	311	2,490	35	23	196

Location	2005								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	158	125	1,125	Not applicable			Not applicable		
2. Franklin Street and Church Street	38	51	411	155	257	1,752	24	16	131
3. Franklin Street and North Columbia Street	353	724	4,389	431	769	5,317	128	248	1,226
4. Franklin Street at Coffee Shop	392	708	4,232	526	802	5,471	Not applicable		
5. Franklin Street and Henderson Street	398	718	3,868	98	211	1,089	48	93	485
6. Franklin Street and Hillsborough-Raleigh Street	81	114	866	32	75	359	28	5	95
7. Columbia Street at Fraternity Court	419	812	4,432	666	715	5,214	Not applicable		
8. Cameron Avenue and Pittsboro Street	5	15	61	316	327	2,445	47	86	519
9. McCauley Street and Pittsboro Street	70	107	763	97	115	897	40	50	286
10. McCauley Street/South Road and Columbia Street	276	347	2,173	83	151	1,001	177	267	2,030
11. South Road at Bell Tower/Stadium Drive	1,169	1,679	13,457	248	345	2,318	539	628	3,390
12. Raleigh Street and South Road	420	542	3,602	271	309	1,907	20	21	123
13. Country Club Road and South Road	30	88	316	56	78	447	89	137	873
14. Manning Drive at Craige Deck	327	317	2,696	32	83	469	29	78	396
15. Manning Drive and Ridge Road	407	519	4,094	300	333	2,783	126	47	433

Location	2007								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	139	119	874	Not applicable			Not applicable		
2. Franklin Street and Church Street	48	125	754	132	279	2,073	22	39	188
3. Franklin Street and North Columbia Street	407	606	4,107	376	687	5,190	67	87	1,068
4. Franklin Street at Coffee Shop	291	716	3,876	202	243	1,832	Not applicable		
5. Franklin Street and Henderson Street	372	721	3,919	82	229	1,407	145	140	1,232
6. Franklin Street and Hillsborough-Raleigh Street	128	191	1,089	22	61	413	26	21	235
7. Columbia Street at Fraternity Court	325	271	2,476	869	840	5,285	Not applicable		
8. Cameron Avenue and Pittsboro Street	26	39	258	373	368	2,985	42	82	523
9. McCauley Street and Pittsboro Street	102	162	1,132	138	146	1,156	47	38	475
10. McCauley Street/South Road and Columbia Street	327	296	2,142	293	384	2,294	463	430	3,480
11. South Road at Bell Tower/Stadium Drive	1,586	1,765	15,913	303	531	3,869	778	667	3,670
12. Raleigh Street and South Road	340	331	2,622	425	386	3,549	46	51	533
13. Country Club Road and South Road	33	79	339	60	90	435	56	88	408
14. Manning Drive at Craige Deck	545	759	5,406	86	114	956	55	93	629
15. Manning Drive and Ridge Road	405	374	3,433	361	430	3,435	33	41	339

* Represents pedestrians who remained on the sidewalk and turned the corner rather than cross the street.
Counts were taken in the Fall of 2011 while the University was in session. The peaks summarized are the pedestrian peak periods and do not necessarily coincide with vehicle peak hours.

Table 3-7: Pedestrian Counts (cont.)

Location	2009								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	141	145	1,057	Not applicable			Not applicable		
2. Franklin Street and Church Street	67	99	714	135	332	2,235	11	11	122
3. Franklin Street and North Columbia Street	349	585	3,927	340	684	5,157	44	111	805
4. Franklin Street at Coffee Shop	315	567	3,392	260	618	3,703	Not applicable		
5. Franklin Street and Henderson Street	121	313	1,650	111	201	1,663	320	409	3,427
6. Franklin Street and Hillsborough-Raleigh Street	102	175	1,138	27	47	400	60	45	448
7. Columbia Street at Fraternity Court	678	562	5,014	16	17	112	Not applicable		
8. Cameron Avenue and Pittsboro Street	55	51	330	248	283	2,504	57	93	694
9. McCauley Street and Pittsboro Street	91	188	1,008	78	55	526	124	123	1,167
10. McCauley Street/South Road and Columbia Street	320	539	2,543	486	343	2,880	100	152	1,155
11. South Road at Bell Tower/Stadium Drive	1,774	1,981	17,097	432	436	3,809	106	109	1,251
12. Raleigh Street and South Road	249	281	2,470	389	408	3,578	0	5	139
13. Country Club Road and South Road	18	61	290	47	45	311	21	53	294
14. Manning Drive at Craige Deck	438	559	4,045	38	117	799	38	72	570
15. Manning Drive and Ridge Road	493	673	4,691	351	630	3,855	0	1	19

Location	2011								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	100	158	977	Not applicable			Not applicable		
2. Franklin Street and Church Street		**			**			**	
3. Franklin Street and North Columbia Street	382	690	5,619	586	760	6,640	49	117	870
4. Franklin Street at Coffee Shop	397	578	3,951	247	559	3,649	Not Applicable		
5. Franklin Street and Henderson Street	355	626	4,153	135	250	1,895	126	130	874
6. Franklin Street and Hillsborough-Raleigh Street	110	149	947	33	116	526	19	36	262
7. Columbia Street at Fraternity Court	259	470	3,451	919	705	5,930	Not applicable		
8. Cameron Avenue and Pittsboro Street	49	84	592	418	376	3,003	20	32	273
9. McCauley Street and Pittsboro Street	78	140	953	176	229	1,612	54	50	428
10. McCauley Street/South Road and Columbia Street	387	603	2,884	239	303	1,856	85	61	592
11. South Road at Bell Tower/Stadium Drive	1,359	1,577	11,608	262	286	2,760	56	98	871
12. Raleigh Street and South Road	496	495	3,611	467	536	3,722	101	46	531
13. Country Club Road and South Road	16	36	205	22	26	218	22	39	251
14. Manning Drive at Craige Deck	438	507	4,068	61	95	670	69	89	637
15. Manning Drive and Ridge Road	539	772	4,106	362	518	3,257	9	13	76

Location	2013								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	132	138	1,088	Not applicable			Not applicable		
2. Franklin Street and Church Street	147	208	1,526	152	312	2,476	34	49	395
3. Franklin Street and North Columbia Street	451	622	5,026	413	577	5,785	296	519	3,454
4. Franklin Street at Coffee Shop	515	679	5,350	551	673	5,625	Not Applicable		
5. Franklin Street and Henderson Street	268	552	3,517	81	162	1,329	68	162	921
6. Franklin Street and Hillsborough-Raleigh Street	137	139	1,171	67	73	632	38	80	425
7. Columbia Street at Fraternity Court	769	718	6,025	1,125	646	5,858	Not applicable		
8. Cameron Avenue and Pittsboro Street	45	62	411	376	429	3,179	54	62	516
9. McCauley Street and Pittsboro Street	103	124	1,035	133	172	1,335	138	155	1,201
10. McCauley Street/South Road and Columbia Street	325	381	2,454	444	416	2,525	693	289	2,547
11. South Road at Bell Tower/Stadium Drive	721	746	7,001	226	283	2,324	520	470	4,940
12. Raleigh Street and South Road	409	494	4,004	651	714	5,995	15	63	451
13. Country Club Road and South Road	43	22	191	26	31	244	61	72	593
14. Manning Drive at Craige Deck	453	455	3,954	60	83	749	45	65	449
15. Manning Drive and Ridge Road	525	582	4,458	460	501	4,007	36	70	422

Location	2015								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	108	130	1,019	Not applicable			Not applicable		
2. Franklin Street and Church Street	15	37	265	206	395	2,899	98	34	543
3. Franklin Street and North Columbia Street	172	493	3,560	262	621	4,834	42	62	462
4. Franklin Street at Coffee Shop	271	468	4,033	141	233	2,063	Not Applicable		
5. Franklin Street and Henderson Street	284	391	3,817	67	229	1,351	27	17	159
6. Franklin Street and Hillsborough-Raleigh Street	112	144	1,150	54	66	565	12	21	162
7. Columbia Street at Fraternity Court	274	331	3,916	592	374	4,568	Not applicable		
8. Cameron Avenue and Pittsboro Street	38	53	504	574	482	4,114	38	40	467
9. McCauley Street and Pittsboro Street	136	147	1,356	195	189	1,515	32	31	297
10. McCauley Street/South Road and Columbia Street	315	341	2,941	302	345	2,878	124	139	1,022
11. South Road at Bell Tower/Stadium Drive	374	5	3,258	351	379	4,262	420	327	3,552
12. Raleigh Street and South Road	260	376	3,234	448	385	4,477	96	30	332
13. Country Club Road and South Road	63	53	365	34	36	252	29	31	303
14. Manning Drive at Craige Deck	408	435	3,909	56	110	711	33	66	338
15. Manning Drive and Ridge Road	417	571	4,039	386	516	3,494	5	9	41

Table 3-7: Pedestrian Counts (cont.)

Location	2017								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	110	136	967	Not applicable			Not applicable		
2. Franklin Street and Church Street	102	159	925	45	52	475	12	54	95
3. Franklin Street and North Columbia Street	320	441	4,085	485	712	5,111	30	48	444
4. Franklin Street at Coffee Shop	315	374	2,709	620	833	6,177	Not applicable		
5. Franklin Street and Henderson Street	414	531	3,947	140	179	1,061	43	19	154
6. Franklin Street and Hillsborough-Raleigh Street	106	109	1,005	36	90	521	22	46	308
7. Columbia Street at Fraternity Court	828	987	7,237	583	532	4,196	Not applicable		
8. Cameron Avenue and Pittsboro Street	59	113	648	682	665	5,156	63	66	480
9. McCauley Street and Pittsboro Street	104	159	1,100	194	226	1,523	27	45	131
10. McCauley Street/South Road and Columbia Street	263	304	1,976	278	382	2,178	85	125	811
11. South Road at Bell Tower/Stadium Drive	779	644	6,101	237	294	2,180	608	468	4,696
12. Raleigh Street and South Road	460	553	3,515	386	617	3,547	19	40	303
13. Country Club Road and South Road	15	36	202	26	25	178	42	33	264
14. Manning Drive at Craige Deck	336	388	3,002	22	40	228	12	18	118
15. Manning Drive and Ridge Road	838	402	4,327	524	492	3,867	23	15	118

Location	2019								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	159	181	1,264	Not applicable			Not applicable		
2. Franklin Street and Church Street	232	317	2,700	251	423	3,021	8	16	110
3. Franklin Street and North Columbia Street	330	467	3,840	307	642	4,433	56	76	734
4. Franklin Street at Coffee Shop	252	352	2,812	477	758	5,836	Not applicable		
5. Franklin Street and Henderson Street	350	472	3,277	95	143	1,362	6	2	146
6. Franklin Street and Hillsborough-Raleigh Street	72	101	568	45	42	370	25	47	245
7. Columbia Street at Fraternity Court	834	734	5,987	1,169	888	7,314	Not applicable		
8. Cameron Avenue and Pittsboro Street	94	87	655	407	337	2,662	49	35	331
9. McCauley Street and Pittsboro Street	185	166	1,399	198	184	1,343	13	17	163
10. McCauley Street/South Road and Columbia Street	491	545	3,436	571	579	3,514	229	245	1,545
11. South Road at Bell Tower/Stadium Drive	721	547	5,481	335	411	3,910	622	392	4,008
12. Raleigh Street and South Road	323	292	2,662	347	300	2,396	34	56	276
13. Country Club Road and South Road	13	11	130	20	27	126	24	24	224
14. Manning Drive at Craige Deck	459	441	3,093	92	89	578	10	36	290
15. Manning Drive and Ridge Road	480	509	3,849	372	428	3,035	15	23	140

Location	2023								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	239	260	1,874	Not applicable			Not applicable		
2. Franklin Street and Church Street	272	372	3,006	276	365	2,731	130	221	1,369
3. Franklin Street and North Columbia Street	638	616	5,156	873	842	6,699	74	216	1,170
4. Franklin Street at Coffee Shop	320	447	3,165	843	1,246	8,707	Not applicable		
5. Franklin Street and Henderson Street	542	433	3,718	171	269	1,597	93	118	657
6. Franklin Street and Hillsborough-Raleigh Street	115	99	781	81	50	431	66	67	441
7. Columbia Street at Fraternity Court	645	713	5,362	614	651	5,073	Not applicable		
8. Cameron Avenue and Pittsboro Street	101	94	779	462	471	3,534	76	43	554
9. McCauley Street and Pittsboro Street	214	165	1,377	158	169	1,372	54	57	480
10. McCauley Street/South Road and Columbia Street	542	522	3,650	510	432	3,028	624	587	4,234
11. South Road at Bell Tower/Stadium Drive	695	587	5,819	356	626	4,737	632	360	2,913
12. Raleigh Street and South Road	392	548	3,945	390	527	4,490	39	33	553
13. Country Club Road and South Road	46	45	315	49	86	502	23	27	311
14. Manning Drive at Craige Deck	347	406	3,085	65	89	560	12	44	205
15. Manning Drive and Ridge Road	433	608	4,396	463	602	4,232	41	9	205

Location	2001-2023 Percent Change								
	North-South			East-West			North-South/East-West*		
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total
1. Columbia Street between Rosemary Street and Airport Road	152%	233%	65%	Not applicable			Not applicable		
2. Franklin Street and Church Street	444%	288%	365%	207%	131%	18%	1344%	2110%	1168%
3. Franklin Street and North Columbia Street	194%	83%	26%	270%	93%	21%	30%	209%	41%
4. Franklin Street at Coffee Shop	30%	2%	-28%	210%	345%	95%	Not applicable		
5. Franklin Street and Henderson Street	122%	-2%	-15%	32%	62%	-30%	200%	141%	39%
6. Franklin Street and Hillsborough-Raleigh Street	113%	14%	-18%	212%	79%	3%	247%	116%	14%
7. Columbia Street at Fraternity Court	392%	129%	84%	52%	43%	23%	Not applicable		
8. Cameron Avenue and Pittsboro Street	621%	224%	126%	114%	72%	29%	230%	258%	163%
9. McCauley Street and Pittsboro Street	478%	195%	83%	76%	56%	-10%	93%	43%	7%
10. McCauley Street/South Road and Columbia Street	290%	116%	72%	985%	454%	212%	779%	878%	405%
11. South Road at Bell Tower/Stadium Drive	-11%	-17%	-42%	90%	213%	75%	766%	620%	487%
12. Raleigh Street and South Road	17%	66%	-6%	222%	402%	210%	-48%	-20%	-14%
13. Country Club Road and South Road	100%	-30%	-41%	48%	87%	1%	-80%	-64%	-75%
14. Manning Drive at Craige Deck	434%	566%	220%	442%	68%	69%	-40%	120%	7%
15. Manning Drive and Ridge Road	48%	44%	-11%	486%	214%	110%	105%	-50%	-29%

* Represents pedestrians who remained on the sidewalk and turned the corner rather than cross the street.

** Location not counted in 2011 to due to construction.

Counts were taken in the Fall while the University was in session. The peaks summarized are the pedestrian peak periods and do not necessarily coincide with vehicle peak hours.

A number of improvements were identified and included in the Master Plan. While these do not provide a complete network of bicycle routes on Main Campus, they enhance connectivity and safety at a reasonable cost, and with minimal adverse impacts. Recommended improvements include education, encouragement and enforcement programs that do not involve roadway infrastructure changes. These recommendations are described in Chapter 5 of the Bicycle Master Plan. These improvements are in addition to a commitment to control traffic speeds on campus streets and to improve safety for cyclists and pedestrians, particularly through active construction areas. Specific improvements to encourage cycling include:

- Bicycle Ambassador Program to perform outreach.
- Marketing campaign to promote mutual respect between cyclists and motorists.
- Bicycle education classes through Campus Recreation.
- New student orientation that includes bicycle safety components.
- Improved bicycle registration and safety outreach.
- Employee training on multi-modal travel, including staff who operate UNC-owned vehicles on campus.
- Annual student bike ride event to support the Cyclicious event each fall.
- Pursuit of a Bike Share System in cooperation with the Town of Chapel Hill; the University launched the Tar Heel Bikes bikeshare program in fall 2017. The system has been expanded in 2023 to include e-bikes.

Other recommendations that emerged from the Master Plan address the importance of supporting facilities and policies, and include:

- Designing all new roads that are included in the Development Plan to safely accommodate cyclists.
- Development of a comprehensive bicycle resources webpage (https://move.unc.edu/bike/).
- Updates to the (digital) campus map to include bicycle facilities, amenities, and wayfinding.
- The planning and design of new buildings and facilities to include showers, along with storage for bicycles and cyclists' equipment.

Improvements on Main Campus and within the towns will be implemented over time. The University has been invited to appoint, and has appointed, an employee to serve on the Town of Chapel Hill's Transportation & Connectivity Board. The University is working in similar ways with the Town of Carrboro in its bike planning efforts. The University believes it is appropriate for the University and Towns to jointly undertake these investigations using data that will be collected by the University and Town, GIS data, and other information that may be relevant.

For the purpose of estimating transportation needs for the Development Plan, no increase in cycling is assumed.

3.2.8 Pedestrians

A priority objective of the Master Plan was to create a more pedestrian-friendly and accessible campus. Numerous pedestrian enhancements, including pedestrian bridges, are included in the plan. While the pedestrian environment will be improved, it is unlikely that this alone will divert a significant number of drive-alone commuters.

The 2019 Commuter Survey indicates walking amongst employees was steady (2 percent) and increased amongst commuting students (from 9 to 16 percent). Mode share for walking has fluctuated in prior years, and it is generally correlated with transit usage (as one goes up the other goes down). Pedestrian counts were undertaken in November 2023, at the same locations the same day of the week as for the previous TIAs. The locations are identified in Figure 3-3, and the counts summarized in Table 3-7. Counts were taken between 7:00 A.M. and 7:00 P.M. on a Tuesday, Wednesday or Thursday. The counts include pedestrians crossing the street in the general vicinity of the intersection, as well as those on the sidewalks.

A comparison of the 2001, 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017, 2019 and 2023 counts is included in the lower portion of Table 3-7. This indicates that there has been shifts in pedestrian activity since 2001, with some locations seeing big increases and some locations seeing decreases in pedestrian activity.

3.2.9 Park-and-Ride

Park-and-ride continues to be one of the key and most successful strategies for reducing Main Campus parking needs. The intent of the University, in cooperation with the Town, is to offer commuters a well-planned and operated park-and-ride system providing a level of convenience approaching that of peripheral parking lots on Main Campus.

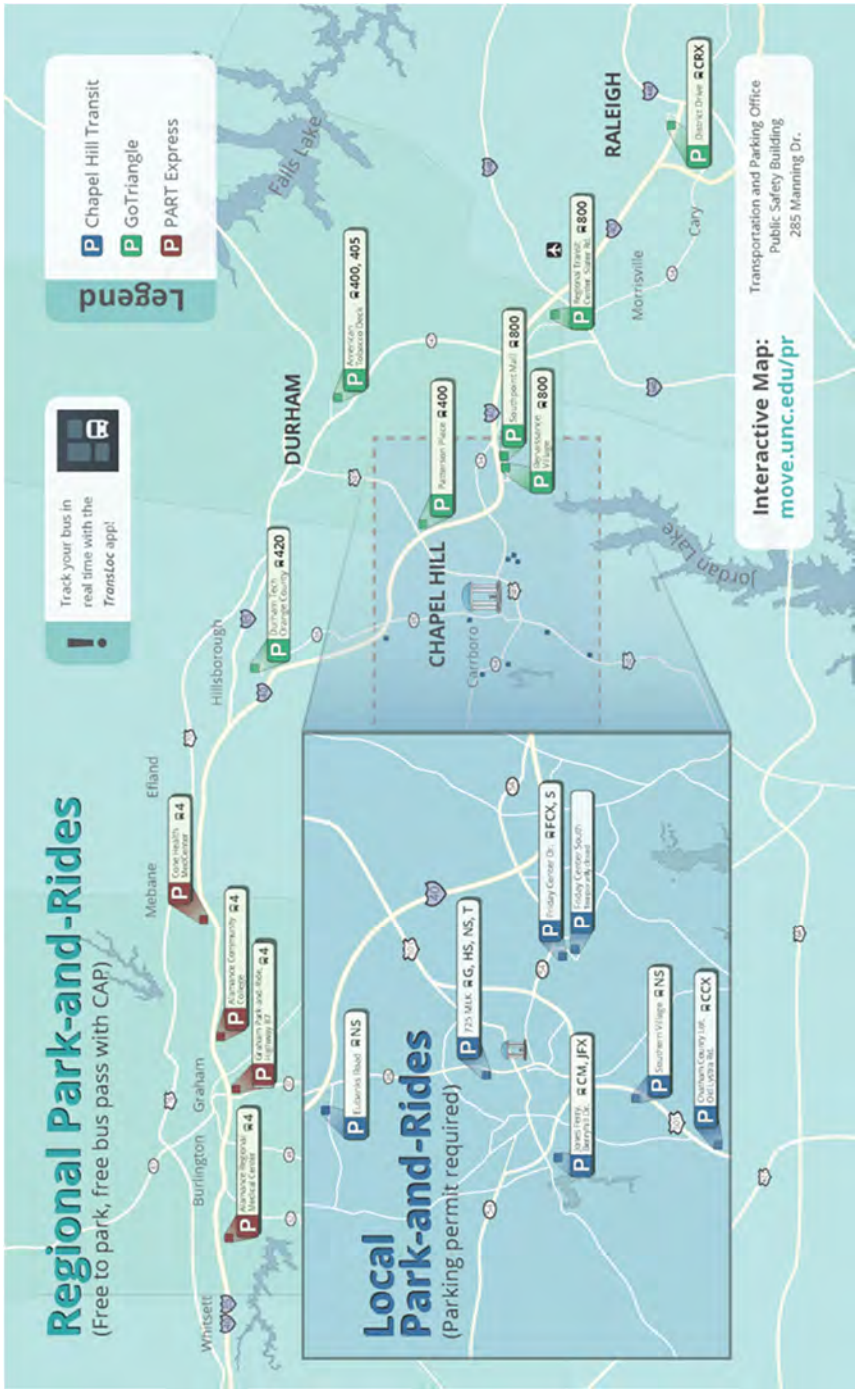
Starting in 2013, fees are now implemented for all UNC Park & Ride lot permits. The permit fee for employees is based on salary, and ranges from $234 to $402 per year. The permit fee for students is $175.50 for the academic year. Full year student rates are no longer offered. Temporary permits are available for $2 per day or $6 per week. The introduction of park-and-ride fees has been associated with a drop in use, with employee use dropping from 16 percent in the 2013 commuter survey to 7 percent in 2015, and student use declining as well (12 percent in 2013 to 6 percent in 2015). Note the 2013 survey was conducted before the pricing changes. This drop in park-and-ride use is also reflected in the counts of park-and-ride lots (Table 3-8); note that 2015, and 2019 and 2023 counts were taken after the pricing changes took effect.

Existing park-and-ride lots are identified in Figure 3-4 and summarized in Table 3-8. The Friday Center and Jones Ferry Road lots were opened in 2002, the Chatham Lot was opened in 2005, and the Pittsboro Lowes Lot was opened in 2011. These four additions to the park-and-ride system have increased the total park-and-ride count from 1,988 spaces in 2001 to 3,881 in 2019. Five of the lots (the Friday Center lot, the NC 54 East lot, the Chatham County lot, the Franklin Street lot, and the Hedrick lot at the Friday Center) are exclusively for University users.

Table 3-8 also reports the usage of the lots in 2001, 2003, 2005, 2007, 2009, 2011, 2013, 2015, 2017, 2019, and 2023. The Friday Center lot generally fills, and due to nominal time

of day impacts, it is assumed that the 802 counted in 2023 represent a lot generally filling to capacity. as in the past, this lot most likely accommodates commuters from the US 15-501 North corridor, which has little park-and-ride, in addition to commuters from the east. Park and Ride utilization is currently reduced by approximately 37 percent from recent years, likely due to the impacts of COVID-19 and the rise of remote work and learning.

Figure 3-4: Location of Park and Ride Lots



Source: UNC-Chapel Hill Park & Ride map

Table 3-8: Park-and-Ride Inventory and Utilization

Location	No. of Spaces	Utilization											
		2001	*2002*	*2003*	*2005*	*2007*	*2009*	*2011*	*2013*	*2015*	*2017*	*2019*	*2023*
NC 54 East (Friday Center South)	512	550	1,285	526	541	508	512	430	204	112	87	220	-
Friday Center	871		Incl. in NC 54	875	890	882	871	867	842	795	752	871	802
Southern Village	400	280	410	355	376	388	385	379	272	260	325	400	243
Jones Ferry Road	443		245	205	259	252	230	231	132	102	86	96	46
Carrboro Plaza	145	155	Incl. in Jones Ferry	115	129	136	111	96	52	30	24	32	20
Eubanks Road	400	140	270	119	253	234	268	346	185	188	216	170	65
Estes Commuter Lot		220	Incl. in Eubanks Rd.	138	318	-	-	-	-	-	-	-	-
Franklin Street	67	95	95	95	94	67	67	67	32	-	-	-	-
Hedrick Lot (Friday Center)	278	230	230	230	211	269	-	86	72	60	36	73	66
Chatham Lot	550	-	-	-	123	150	214	187	144	146	129	143	36
Bible Church Lot	-	-	-	-	-	79	-	-	-	-	-	-	-
MLK Jr Blvd Lot	40	-	-	-	-	39	40	40	39	41	40	40	40
Pittsboro Lowes	175	-	-	-	-	-	-	33	33	26	22	16	-
Totals	**3,881**	**1,670**	**2,535**	**2,658**	**3,194**	**3,004**	**2,698**	**2,762**	**2,007**	**1,760**	**1,717**	**2,061**	**1,318**

Notes:
1. Friday Center and Jones Ferry Road lots opened in 2002, Chatham lot opened fall 2005, Bible Church and MLK Jr Blvd lots opened in 2007.
2. Franklin Street lot is leased lot north of campus.
3. PH/Hedrick lot restricted to Hospitals employees.
4. Lot capacities are current, and some have changed over time.
5. 2003 survey conducted on Tuesday, November 11 between 9:30 and 11:30 A.M.
6. 2005 survey conducted on Tuesday, November 15 between 9:30 and 11:30 A.M.
7. 2007 survey conducted on Tuesday, November 13 between 9:30 and 11:30 A.M.
8. Estes Commuter Lot closed in 2007 for park-and-ride.
9. 2009 survey conducted on Tuesday, November 17 between 9:30 and 11:30 A.M.
10. In 2009, Bible Church Lot and Hedrick Lot no longer used for park and ride.
11. In 2011, Pittsboro Lowes Lot opened.
12. 2011 survey conducted on Tuesday, November 15 between 10:00 A.M. and 1:00 P.M.
13. 2013 survey conducted on Tuesday, November 19 between 10:00 A.M. and 1:00 P.M.
14. 2015 survey conducted on Tuesday, November 17 between 9:30 A.M. and 12:00 P.M.
15. 2017 survey conducted on Tuesday, November 15 between 10:00 A.M. and 1:00 P.M.
16. 2019 survey conducted on Tuesday, November 15 between 10:00 A.M. and 1:00 P.M.
17. 2023 survey conducted on Tuesday, October 17 between 10:00 A.M. and 1:00 P.M.

New commuters who are not projected to switch to the alternatives described earlier in this section will be accommodated in park-and-ride facilities. The resulting park-and-ride requirement is shown in Table 3-9. The parking "shortfall" at the completion of the Development Plan in 2024 to be addressed by increased park-and-ride has been decreased from 1,338 to 911 spaces. To date the University, in conjunction with the Town, have added over 2,200 spaces, i.e., more than what is required to satisfy the needs of the Development Plan. Also, note that the increase in the "shortfall" that is to be satisfied by park-and-ride is primarily due to an increase in the population numbers by projecting population growth to 2024, not just 2015.

An analysis was undertaken to determine the amount of additional park-and-ride spaces required in each major approach corridor. This is shown in Table 3-9. Figure 3-5 and Figure 3-6 show the regional distribution of University/Hospitals employees (updated with 2023 addresses) and the proportion of employees by approach corridor for Main Campus. Table 3-10 also summarizes employee addresses by zip code (includes zip codes only in North Carolina that could be geocoded).

Table 3-9 shows that all corridors with the exception of US 15-501 North will have more than enough park-and-ride spaces at the completion of the Development Plan. The

University and Town continue to study opportunities to address this need, which in turn will alleviate the current excessive demand for the Friday Center lot.

Table 3-9: Demand for Park-and-Ride by Corridor

	Current		% of Total	Theoretical	Adjusted	Future		
	Number of	Actual	Commuters	Current	Current	Additional	Total	Spaces
Approach Direction	Spaces[2]	Utilization	in Corridor[3]	Demand[4]	Demand[5]	Demand[6]	Demand	Needed[7]
US 15-501 from N[1]	67	-	24.5%	323	311	(46)	265	198
NC 54 from E	1,661	868	42.5%	560	516	(76)	440	(1,221)
US 15-501 from S	1,125	279	11.1%	147	165	(24)	140	(985)
NC 54 from W	588	66	10.5%	138	140	(21)	119	(469)
I-40 from W/NC 86 from N	440	105	11.3%	149	196	(29)	167	(273)
Total Park-and-Ride Spaces	**3,881**	**1,318**	100.0%	**1,318**	**1,328**	**(196)**	**1,132**	**(2,749)**

Notes

1. Actual demand is considered to be much higher given the number of commuters in the corridor, but currently there is a only 67-space lot in the corridor. Commuters most likely using NC 54 and Friday Center lots.
2. Refer to Table 3-8 for lot capacities.
3. Based on geocoding of 2019 UNC commuter addresses.
   NC 54 from east includes Farrington Road from south.
4. Assumes demand is a function of the percentage of commuters in the corridor based on geocoding of employee home addresses.
5. Determined by adjusting theoretical current demand for actual demand numbers while keeping total constant. For example, it is known that some commuters in corridors where there is no park-and-ride park in facilities in adjacent corridors.
6. Total projected need for additional park-and-ride over life of Development Plan (refer to Table 3-2) = 911
   Future need accounts for increase in demand to date but subtracts 200 for non-University park-and-ride users (1,107 spaces): -196
7. Numbers assume recently-constructed lots and use of empty spaces in existing park-and-ride lots.

Figure 3-5: Regional Distribution of Employee Home Addresses

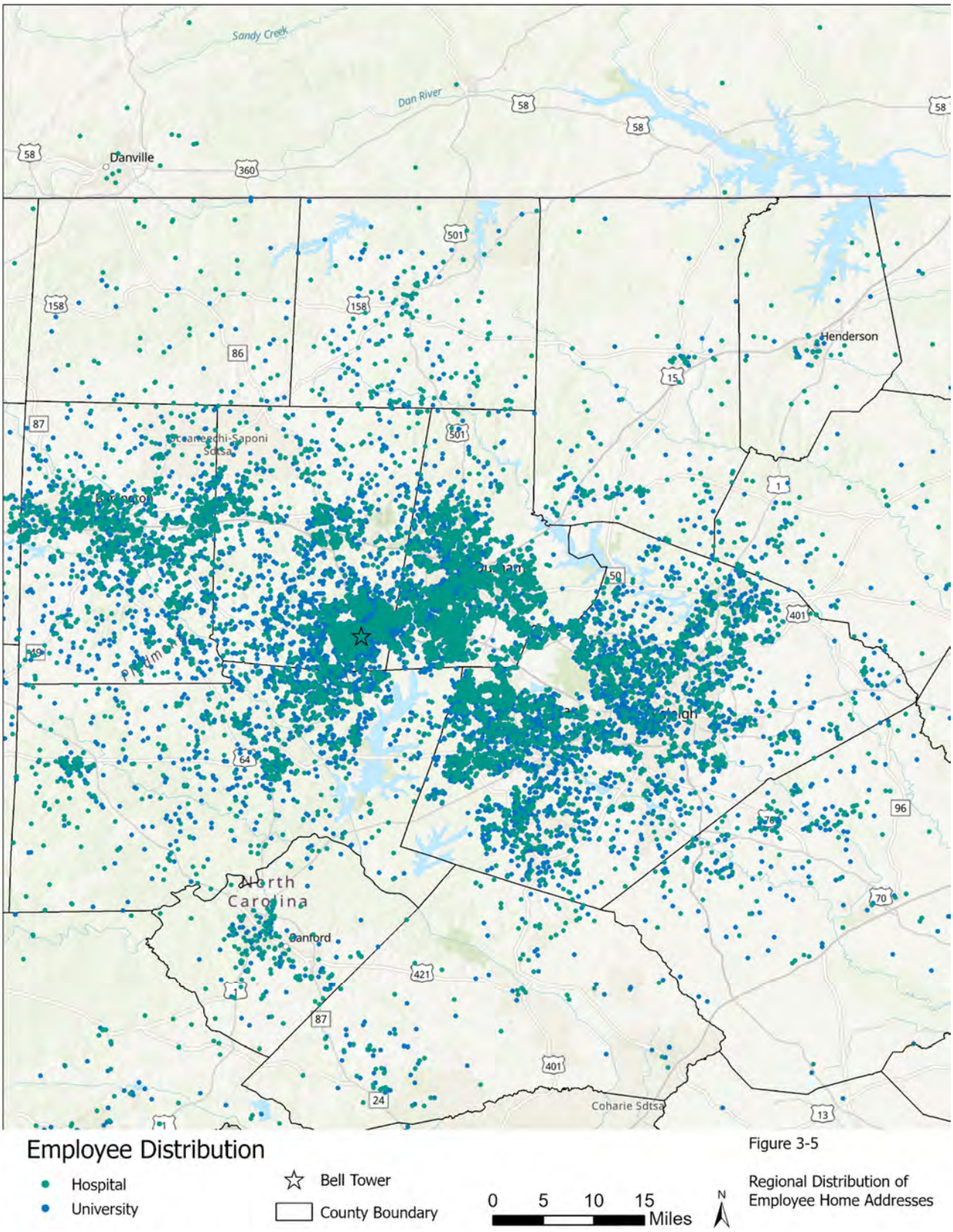


Figure 3-6: Proportion of Employees by Approach Corridor (2023)

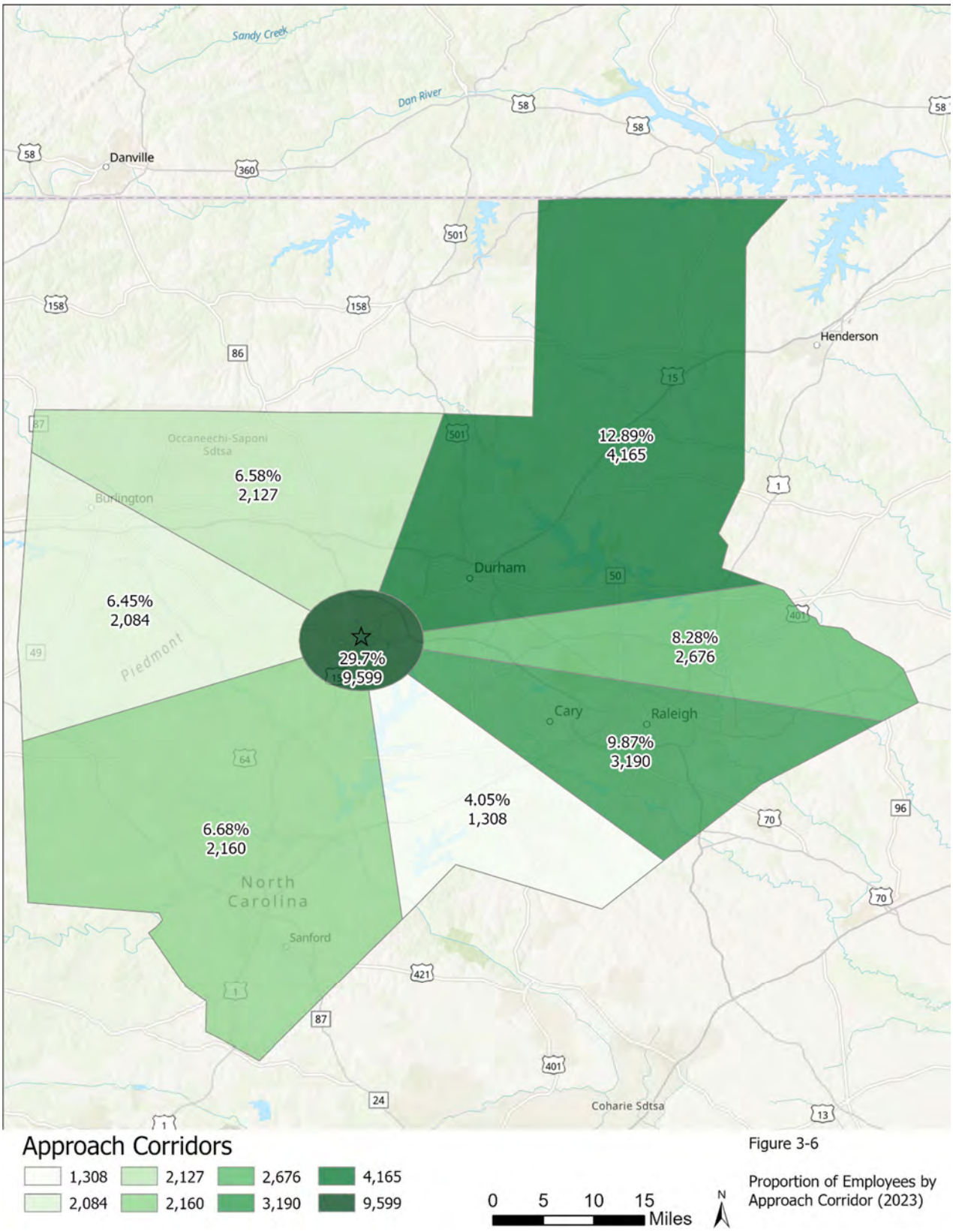


Table 3-10: Summary of Employee Addresses by Zip Code

Zip Code	# Empl.	Zip Code	# Empl.	Zip Code	# Empl.	Zip Code	# Empl.	Zip Code	# Empl.	Zip Code	# Empl.	Zip Code	# Empl.	Zip Code	# Empl.	Zip Code	# Empl.	Zip Code	# Empl.	Zip Code	# Empl.
27516	3,666	27243	123	27591	39	28655	22	28079	15	28625	11	28512	7	28752	5	28690	4	28479	3	27512	3
27514	2,613	27529	121	27834	38	28803	22	28278	15	28054	11	28792	7	28465	5	28518	4	28605	3		
27713	2,034	27607	115	28269	38	28326	22	28215	15	28214	11	28694	7	28697	5	28658	4	28777	3		
27517	2,015	27518	115	27858	38	28327	22	27214	15	28401	11	28712	7	28759	5	28217	4	28464	3		
27510	1,922	27539	112	27599	38	27360	22	27537	15	28092	11	28461	7	28681	5	28323	4	28634	3		
27707	1,205	27604	110	27106	38	27515	22	27355	15	27804	11	28428	7	28604	5	28449	4	28723	3		
27312	905	27410	99	27573	37	28387	21	28216	14	28147	11	27589	7	28532	5	28360	4	28642	3		
27302	883	27332	92	27571	36	27536	21	28146	14	27376	11	28394	7	28107	5	27949	4	28730	3		
27703	866	28277	90	27403	35	28590	20	28205	14	27023	11	27863	7	28212	5	28365	4	28659	3		
27278	840	27377	80	27405	34	28025	20	28390	14	27505	11	28043	7	27886	5	27851	4	28621	3		
27519	824	27522	80	27408	34	27205	20	27295	14	27263	11	28150	7	28166	5	28371	4	28748	3		
27253	687	27545	71	28036	33	28516	19	28791	13	27292	11	28086	7	28445	5	28202	4	28582	3		
27705	646	27520	68	27320	33	28314	19	28704	13	28602	10	27291	7	28120	5	28372	4	28345	3		
27502	439	27244	65	27012	32	28210	19	28504	13	28303	10	27569	7	27892	5	28425	4	27699	3		
27704	427	28173	62	28374	31	28227	19	28613	13	28023	10	27212	7	27822	5	27954	4	27880	3		
27215	408	28027	61	28104	30	28304	19	28031	13	28312	10	27040	7	27889	5	28138	4	28139	3		
27560	398	27541	60	27605	30	27103	19	27909	13	28315	10	27504	7	28320	5	27910	4	27801	3		
27701	381	27527	60	28105	30	27379	19	27717	13	28213	10	27260	7	28429	5	27850	4	27809	3		
27513	337	27574	60	28412	29	27509	19	28012	13	28207	10	27235	7	28379	5	27715	4	28366	3		
27217	304	27265	59	27601	26	27592	18	28144	13	27021	10	27343	7	27948	5	27823	4	27983	3		
27712	282	27298	58	28306	26	27893	18	28083	13	27581	10	27262	7	27709	5	28206	4	28301	3		
27587	262	27572	55	28226	26	27896	18	27127	13	27288	10	27208	7	27828	5	27025	4	28164	3		
27613	257	28078	54	27104	26	28607	17	27530	13	27028	10	28610	6	27041	5	27017	4	28134	3		
27540	230	27407	54	27549	26	28804	17	27252	13	27576	10	28467	6	27521	5	25717	4	28174	3		
27612	221	27583	53	27282	26	28376	17	27030	13	27107	10	28594	6	27045	5	27326	4	28341	3		
27617	208	27455	53	28557	25	28262	17	28739	12	27401	10	28630	6	27305	5	27311	4	28208	3		
27615	199	27406	52	28411	25	28405	17	28546	12	28779	9	27882	6	27370	5	24541	4	28090	3		
27616	196	27565	49	28403	25	27870	17	28787	12	28734	9	28358	6	27557	5	27313	4	27921	3		
27523	193	27608	48	27358	25	28348	17	28540	12	28805	9	28334	6	28786	4	24586	4	27960	3		
27344	182	27559	48	28075	24	27310	17	28801	12	28560	9	27856	6	28572	4	27048	4	28034	3		
27606	181	27596	47	28270	24	28645	16	28732	12	27702	9	28377	6	28716	4	24540	4	28052	3		
27349	177	27597	47	27546	24	28601	16	28677	12	28209	9	28127	6	28711	4	27563	4	28307	3		
27330	176	27207	47	27501	24	28562	16	28443	12	28203	9	28112	6	28626	4	28638	3	27331	3		
27258	173	27249	46	28115	23	27314	16	28352	12	28056	9	28001	6	28466	4	28480	3	27325	3		
27610	168	27284	44	28211	23	27577	16	28037	12	27534	9	27544	6	28539	4	28470	3	27315	3		
27526	167	27231	43	28451	23	27524	16	28328	12	27803	8	27553	6	28714	4	28462	3	27283	3		
27511	162	27562	42	28081	23	27203	16	27340	12	28110	8	27317	6	28513	4	28580	3	27248	3		
27603	154	28117	40	27301	23	28806	15	27006	12	27357	8	27055	6	28715	4	28501	3	27216	3		
27609	131	28409	40	27503	23	28311	15	27316	12	27105	8	27239	6	28460	4	28657	3	27051	3		
27614	126	27525	40	27409	23	28273	15	28570	11	27101	8	28472	5	28778	4	28705	3	27022	3		
The following ZIP codes have 1 employee living in them:																					
80902	48009	37302	28644	62094	28469	95648	28698	43035	28650	53715	28651	78541	28617	89131	28760	272955176	28709	38127	28579	45208	28510
48314	28530	58701	28670	75208	28774	79925	28551	84123	28676	92024	28571	97707	28722	28574	28678	37617	28789	40217	28790	44121	28726
46130	28679	48104	28731	49546	28453	57216	28587	60123	28502	68025	28687	77345	NA	28746	28740	80237	28909	81631	29072	86406	29201
91214	29216	93291	29410	96822	29412	99514	29566	278961154	29605	37076	29642	37409	29803	37922	29928	40014	30078	43026	30096	43906	30097
45040	30110	45324	30318	47906	30342	48026	30677	48168	30901	48623	30907	52246	32312	54115	28742	58554	32708	60073	32746	61561	32828
62966	32903	75057	33024	77027	33025	77407	33033	78705	33069	79407	33097	80224	33130	80303	33156	80904	33177	84103	33187	85251	33321
87402	33418	90402	33713	91335	33803	92506	34105	95610	34280	95841	34638	97530	34677	99507	34786	275754	35396	275131726	35401	36533	37027
28906	28441	28398	28223	27857	28421	28305	27874	28018	27878	28021	27932	27629	27964	27661	27891	27864	27958	27916	28163	28080	28393
27670	27962	28137	27620	27915	28423	28024	28204	27624	28302	27594	28373	28337	27875	28339	27929	28340	27675	28009	27876	27812	28229
28347	27842	28170	28399	28350	27844	28088	27805	28355	28016	28357	28422	27710	28119	27619	27938	27829	28439	28097	27970	28159	28135
28103	27939	27895	3053	22932	5404	22942	20814	23060	27047	27323	16214	14420	27285	17111	21215	23185	27528	17516	4401	23219	22827
23223	8330	18103	25719	27342	20720	23508	21113	23666	2889	23927	3276	12901	27307	23968	919	18326	27075	24014	6071	24015	6784
27229	27157	24018	10469	18612	20136	19046	26104	11763	1503	24104	1756	24153	20852	24382	1824	27402	14620	24502	21234	27404	3260
24520	21776	19139	15748	24539	27046	19709	21801	19805	22304	24577	15905	27415	4730	27428	6033	27438	27556	14617	6340	24592	8053
25252	27150	20007	27201	25714	8510	25716	11434	27507	11939	24083	27242										
The following ZIP codes have 2 employees living in them:																					
28609	28673	28458	28547	28584	32608	28640	28457	78758	28753	28585	28754	28543	28757	28721	28713	28701	28761	28684	28763	28478	28768
28508	28771	28773	28751	28905	28391	27959	27888	28168	28383	28082	27708	27817	28124	28333	28382	27831	28386	27837	27976	27871	28114
28152	27807	28364	28435	27855	27944	27865	27281	27256	27299	25710	27043	27508	27052	27356	27233	27341	27259	27011	24531	27013	27350
27228	27542	27019	27359	27209	27371																

3.2.10 Transit Service

In addition to finding appropriate sites for more park-and-ride, the key to a successful park-and ride system is the ability to run an efficient and quick transit shuttle service to Main Campus. Travel times on the roads can be expected to worsen over time. This is an inconvenience to users, and therefore a disadvantage of park-and-ride as well as adding costs to park-and-ride transit service.

Options for improving bus running times that the University and Town can jointly consider include signal pre-emption, queue bypass lanes, and possibly busway lanes or treatments. These improvements are in addition to more frequent service, more express buses, longer hours, and improved security. Examples of potential busways are described under Chapel Hill Transit improvements.

3.3 SUMMARY OF TRIP DIVERSION

Table 3-2 provides an overview of the how commuters traveled pre-and post-Development Plan. If it is assumed that the trip reduction measures that are implicit in the Development Plan and needed to address the reduced parking are applied only to new commuters (in

reality they will apply to all commuters), then it is projected that new commuters would travel by the following means:

- Drive alone: 74 (1%)
- Chapel Hill Transit: 5,361 (40%)
- Regional transit: 2,874 (21%)
- Ridesharing: 1,335 (passengers and drivers, 10%)
- Bicycle: 652 (5%)
- Walk: 448 (3%)
- Park-and-ride: 2,035 (15%)
- Other: 641 (5%)

Total (adjusted): 13,420 (100%)

The following pages provide a summary explanation of these calculations.

Summary Explanation of Permanent Park-and-Ride Requirement

This section summarizes the calculation of park-and-ride needs.

A. Parking Demand and Shortfall

Total new commuters (employees and students) from University growth projections:

8,203 employees + 3,862 commuting students = 12,065 total new commuters

The Development Plan provides a net addition of 438 parking spaces on Main Campus for commuters. On any particular day not all employees scheduled to work during permitted hours report to work, nor do all commuting students come to campus. This allows more permits than spaces to be sold. Based on current parking oversell ratio statistics (an average of 1.25 permits sold for every space), the 438 spaces can accommodate 438 X 1.25 = **548** of the new employees/commuting students (those driving alone and driving car/vanpools).

Therefore 11,517 of the new commuters must be accommodated by other means.

(It should be noted that in 2001, 77% of employees and 11% of commuting students got on-campus parking permits. Thus, 5,882 employees + 734 students = 6,616 total commuters should get permits if existing ratios continued to apply. Based on the current combined oversell ratio for parking spaces of 1.25, 6,616 commuters = 5,293 parking spaces would be needed.) Given that the plan provides a net increase of 438 spaces for commuters, the "shortfall" is approximately 4,855 spaces (this excludes the resident student "shortfall".)

B. Use of Alternative Modes

Based on current campus commuting trends and observations of other universities that have implemented aggressive trip reduction strategies, future use of the various alternative travel modes was estimated as follows (from Table 3-2).

Chapel Hill Transit

a. Prior to the Development Plan, 5% of employees and 33% of commuting students were estimated to use CHT. If these rates continued to apply for the new population, 394 new employees and 1,274 new commuting students (for a total of 1,668) would use CHT.

b. It is estimated improvements to CHT (fare free, increased service) will result in an additional 3,518 people switching from driving alone to CHT over the life of the Development Plan (NOTE: many of these are existing employees/students living in Chapel Hill/Carrboro and currently driving to campus, as ascertained by GIS analysis).

c. Therefore a total of **5,186 additional people** (compared to pre Development Plan) will use CHT (or approximately 4,149 **daily** commuters given that a proportion of the population does come to campus on any particular day). Use will increase to 15% for employees and 39% for students.

Regional Transit

a. In 2001, approximately almost 1.5% of employees and commuting students used GoTriangle regional transit. If these rates continued to apply for the new population, 167 new employees/commuting students would use regional transit.

b. Based on service improvements and free GoPasses provided by UNC, it is estimated an additional 2,150 people will use regional transit.

c. Therefore a total of **2,855 additional people** will use regional transit, (or approximately 2,284 **daily** commuters given that a proportion of the population does come to campus on any particular day).

Rideshare

a. In 2001, approximately 4% of employees and commuting students were passengers in a rideshare vehicle. If these rates continued to apply for the new population, 513 new employees/commuting students would be passengers.

b. Based on the University's plan to boost its TDM program, it is estimated an additional 278 people will switch to this mode.

c. Therefore a total of **791 additional people** will become rideshare passengers (or approximately 633 **daily** commuters given that a proportion of the population does come to campus on any particular day). Total new rideshare commuters (drivers and passengers) will be 1,226 persons.

Other Modes

Use of other modes (excluding park-and-ride for now) has been increased in proportion to current use (i.e., no additional diversion beyond trend line growth has been assumed). Based on current ratios (derived from the 2009 survey), use of these other modes by new employees and commuting students is estimated to be:

Bicycle:	588 persons
Walk:	381 persons
Other (dropped off, motorcycle, etc.):	577 persons
Total:	**1,546 additional people** (1,237 **daily** commuters)

C. Park-and-Ride Need

In summary, the above accounts for 10,378 commuters, i.e.,

CHT:	5,186
Regional transit:	2,855
Ridesharing:	791 (passengers only)
Other modes:	1,546

Therefore 11,517 – 10,378 = 1,139 commuters. Based on the 1.25 oversell ratio, this is equivalent to 911 commuters (i.e., spaces) on any one day. These people will be accommodated in park-and-ride.

3.4 INTERIM PARK-AND-RIDE NEEDS

Table 3-11 identifies park-and-ride need by year. It builds on Table 2-8 in Section 2.0 which shows the impact of the Development Plan on parking spaces, and Main Campus growth and parking needs for each year (including temporary needs). The total commuter parking "shortfall" for the Development Plan period is approximately 8,793 spaces (assuming current ratios of spaces to commuters). Based on this and the impact of other trip reduction strategies, Table 3-11 identifies the annual and ultimate park-and-ride needs, originally determined by ensuring the cumulative impact (the final row) remains in the positive range.

The table shows that the park-and-ride built spaces to date will meet the ultimate needs of the Development Plan but will not meet the interim needs (the interim shortfalls are caused by temporary construction parking space losses and the fact that some of the decks in the Development Plan are not scheduled until towards the end of the Development Plan period). Developing and implementing parking management strategies that will make more efficient use of existing spaces on campus and in park-and-ride lots will minimize the interim need for short term park-and-ride spaces without having to construct new park-and-ride spaces to address short term needs.

Table 3-11: Preliminary Phasing of Trip Reduction Strategies

	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total
Main Campus Parking Shortfall[1]	-355	-1,130	-599	-776	-110	524	-1,037	-551	-259	464	-280	-255	-646	1,109	-559	-559	-559	-559	-559	-846	446	-7,095
"Natural" Growth in Park-and-Ride Demand[2]	22	38	58	49	52	33	-17	53	50	54	16	17	17	17	49	49	49	50	49	49	51	804
Total Parking Shortfall	***-377***	***-1,168***	***-657***	***-825***	***-162***	***491***	***-1,020***	***-604***	***-309***	***410***	***-296***	***-272***	***-663***	***1,092***	***-608***	***-608***	***-608***	***-609***	***-608***	***-895***	***395***	***-7,900***
Strategy[3,4,5]																						
CHT Transit	50	300	275	225	125	50	50	100	50	25	25	25	190	43	183	183	183	183	417	418	418	3,518
Fare free (2002)																						
Increased services																						
Regional Transit[5]		15	15	10	50	60	70	70	70	60	45	37	200	60	137	137	137	137	459	459	460	2,688
Ridesharing[6]		10	10	20	20	10	10	15	14	10	0	0	0	3	3	2	3	3	48	48	49	278
Reduction in student walk, ride & park-and-ride [7]																						
Temporary Parking[8]																						
Franklin Street lot	95						-28															
CG Lot	125						-125															0
Odum Village				428										-428								0
Park-and-Ride[8]		1,306	278		550	242	-242				175											2,309
Parking Management Strategies								300	350											100	100	
Net Impact for Year (negative no. is shortfall)	**-107**	**463**	**-79**	**-142**	**583**	**853**	**-1,285**	**-119**	**175**	**505**	**-51**	**-210**	**-273**	**770**	**-285**	**-286**	**-285**	**-286**	**316**	**130**	**1,422**	
Cumulative Impact[9]	**-107**	**356**	**277**	**135**	**718**	**1,571**	**286**	**166**	**341**	**847**	**796**	**585**	**313**	**1,082**	**798**	**512**	**227**	**-59**	**257**	**387**	**1,810**	

Notes:

1. Negative number implies loss or shortfall. Shortfalls differ from previous updates because of changes to the Development Plan schedule.
2. "Natural" growth in park-and-ride demand refers to proportional growth based on current use (unrelated to increased use resulting from proposed trip reduction strategies). This growth in spaces (refer to Table 3-2) is 804.
3. The reductions are not expected to come from new employees and students only since the strategies apply to everyone (existing and new). Impacts of all strategies refers to typical day (i.e., take into account that approximately 20% of persons may not be on campus on any particular day).
4. Reductions in the table address the parking "shortfalls" only. It is assumed that current use of alternative modes will continue to apply without the proposed trip reduction strategies (e.g., the proportion of commuters using CHT, bicycles, etc. would continue). Therefore, the increased use of alternatives would in fact be higher than indicated above (refer to Table 3-2 for total numbers).
5. Refer to Table 3-2 for calculations of increased use.
6. Ridesharing estimates refers to reduction in Main Campus vehicles resulting from strategies (refer to Table 3-2).
7. Refer to Table 3-2
8. Park-and-ride built to date. Includes temporary park-and-ride to address interim shortfalls. Results in surplus in all future years. 1,306 in 02/03 is Friday Center and Jones Ferry lots, 278 in 03/04 is Hedrick lot, 550 in 05/06 is Chatham lot, 242 in 06/07 is Bible Church lot (abandoned in 07/08), 175 in 11/12 is Pittsboro Lowes lot.
9. Negative number implies shortfall.

3.5 AIR QUALITY IMPACTS

Based on the diversion of driving commuters to other modes compared to ITE trip rates (as described in Section 3-1), an estimate was prepared of the corresponding reduction in emissions of NOx, VOC's, and CO. The emissions reductions were calculated as follows:

- The number of daily trips diverted to Chapel Hill Transit in 2023 is assumed to be 3,518.

- The number of daily trips diverted to regional transit in 2023 is assumed to be 2,688.

Updated assumptions and results are summarized in Table 3-12. A number of assumptions were made in preparing this estimate:

- No emissions benefits were assumed for a switch to park-and-ride, since most of the trip would still be made via automobile, and the first few miles of a car trip account for most of the pollution. However, emissions on Main Campus will be reduced.

- Since the diverted auto trips are assumed to be commuter trips, no off-peak emission reductions are considered, only A.M. and P.M. peak periods.

- An average trip length of 4 miles was assumed for all trips diverted to Chapel Hill Transit (CHT). Multiplying by 3,518 trips yields 14,072 vehicle-miles of travel (VMT) eliminated in each peak period.

- An average trip length of 14 miles was assumed for all trips diverted to regional transit. Multiplying by 2,688 trips yields a VMT reduction of 37,632 in each peak period.

- The two VMT totals obtained above were distributed among six functional classes of urban streets, five classes of rural roads, and freeway ramps. In the case of trips served by CHT, no travel was assumed to occur on rural facilities. A larger share of travel was assumed to occur on local, collector, and arterial streets. For regional (GoTriangle) trips, 20 percent of travel was assumed to occur on the corresponding classes of rural facilities.

- Durham and Orange County 2024 emission factors for NOx and CO from the DCHC MPO 2035 LRTP AQ Conformity Analysis Appendix F were used for analysis. Emission factors for VOC's were obtained from the CMAQ 2012 values for urban areas. Factors vary by the functional classification of the road being traveled (see above), and separate sets of factors were provided for A.M. and P.M. peak periods in the case of NOx and CO rates.
- A total of 250 workdays were assumed in calculating total annual emission reductions.

Using this methodology, the following emission reductions are estimated for 2017:

- NOx: 24 kg/day (6,110 kg/year)
- VOC: 44 kg/day (10,907 kg/year)
- CO: 808 kg/day (202,066 kg/year)

The University has also moved forward with sustainability efforts for the campus. The *2013 Campus Sustainability Report* details achievements and programs in a variety of areas, including transportation, to enhance campus sustainability. For example, the Report notes the benefits of the Commuter Alternative Program (CAP), the fare-free Chapel Hill Transit system, bicycling, walking, car-sharing, and ridesharing. Further participation in the CAP program and similar initiatives will help improve air quality.

Table 3-12: Estimated Air Quality Impacts

EMISSION REDUCTIONS: NOx

	Functional Classification	2024 Emission Rate	VMT (Served by CHT)	VMT (Outside CHT)	NOx Emissions (Kg)
	AM				
URBAN	Interstate	0.311	693	6,494	2.24
URBAN	Freeway	0.238	3,050	7,011	2.39
URBAN	Other Princ Art	0.217	3,237	5,720	1.95
URBAN	Minor Arterial	0.209	3,518	6,623	2.12
URBAN	Collector	0.205	1,970	3,011	1.02
URBAN	Local	0.236	1,548	2,408	0.93
RURAL	Interstate	0.344	-	1,623	0.56
RURAL	Minor Arterial	0.245	-	1,430	0.35
RURAL	Major Collector	0.235	-	1,656	0.39
RURAL	Minor Collector	0.220	-	753	0.17
RURAL	Local	0.238	-	602	0.14
	Ramps	0.265	56	301	0.09
	AM TOTAL		14,072	37,632	**12.35**
	PM				
URBAN	Interstate	0.287	693	6,494	2.06
URBAN	Freeway	0.228	3,050	7,011	2.29
URBAN	Other Princ Art	0.222	3,237	5,720	1.98
URBAN	Minor Arterial	0.211	3,518	6,623	2.14
URBAN	Collector	0.203	1,970	3,011	1.01
URBAN	Local	0.237	1,548	2,408	0.94
RURAL	Interstate	0.332	-	1,623	0.54
RURAL	Minor Arterial	0.240	-	1,430	0.34
RURAL	Major Collector	0.232	-	1,656	0.38
RURAL	Minor Collector	0.219	-	753	0.16
RURAL	Local	0.240	-	602	0.14
	Ramps	0.257	56	301	0.09
	PM TOTAL		14,072	37,632	**12.09**
	TOTAL DAILY NOx REDUCTION (kg)				**24.44**
	TOTAL ANNUAL NOx REDUCTION (kg)				**6,110**

EMISSION REDUCTIONS: VOC

	Functional Classification	2024 Emission Rate	VMT (Served by CHT)	VMT (Outside CHT)	VOC Emissions (Kg)
	AM				
URBAN	Interstate	0.401	693	6,494	2.88
URBAN	Freeway	0.399	3,050	7,011	4.01
URBAN	Other Princ Art	0.433	3,237	5,720	3.88
URBAN	Minor Arterial	0.433	3,518	6,623	4.39
URBAN	Collector	0.446	1,970	3,011	2.22
URBAN	Local	0.443	1,548	2,408	1.75
RURAL	Interstate	0.397	-	1,623	0.64
RURAL	Minor Arterial	0.418	-	1,430	0.60
RURAL	Major Collector	0.426	-	1,656	0.71
RURAL	Minor Collector	0.428	-	753	0.32
RURAL	Local	0.428	-	602	0.26
	Ramps	0.412	56	301	0.15
	AM TOTAL		14,072	37,632	**21.81**
	PM				
URBAN	Interstate	0.401	693	6,494	2.88
URBAN	Freeway	0.399	3,050	7,011	4.01
URBAN	Other Princ Art	0.433	3,237	5,720	3.88
URBAN	Minor Arterial	0.433	3,518	6,623	4.39
URBAN	Collector	0.446	1,970	3,011	2.22
URBAN	Local	0.443	1,548	2,408	1.75
RURAL	Interstate	0.397	-	1,623	0.64
RURAL	Minor Arterial	0.418	-	1,430	0.60
RURAL	Major Collector	0.426	-	1,656	0.71
RURAL	Minor Collector	0.428	-	753	0.32
RURAL	Local	0.428	-	602	0.26
	Ramps	0.412	56	301	0.15
	PM TOTAL		14,072	37,632	**21.81**
	TOTAL DAILY VOC REDUCTION (kg)				**43.63**
	TOTAL ANNUAL VOC REDUCTION (kg)				**10,907**

EMISSION REDUCTIONS: CO

	Functional Classification	2024 Emission Rate	VMT (Served by CHT)	VMT (Outside CHT)	CO Emissions (Kg)
	AM				
URBAN	Interstate	8.703	693	6,494	62.55
URBAN	Freeway	8.190	3,050	7,011	82.39
URBAN	Other Princ Art	7.571	3,237	5,720	67.81
URBAN	Minor Arterial	7.524	3,518	6,623	76.30
URBAN	Collector	7.663	1,970	3,011	38.17
URBAN	Local	7.557	1,548	2,408	29.90
RURAL	Interstate	6.932	-	1,623	11.25
RURAL	Minor Arterial	7.865	-	1,430	11.25
RURAL	Major Collector	7.456	-	1,656	12.35
RURAL	Minor Collector	7.453	-	753	5.61
RURAL	Local	7.177	-	602	4.32
	Ramps	7.786	56	301	2.78
	AM TOTAL		14,072	37,632	**404.68**
	PM				
URBAN	Interstate	8.771	693	6,494	63.04
URBAN	Freeway	8.190	3,050	7,011	82.39
URBAN	Other Princ Art	7.564	3,237	5,720	67.75
URBAN	Minor Arterial	7.473	3,518	6,623	75.79
URBAN	Collector	7.663	1,970	3,011	38.17
URBAN	Local	7.618	1,548	2,408	30.14
RURAL	Interstate	6.605	-	1,623	10.72
RURAL	Minor Arterial	7.668	-	1,430	10.97
RURAL	Major Collector	7.194	-	1,656	11.91
RURAL	Minor Collector	7.453	-	753	5.61
RURAL	Local	7.231	-	602	4.35
	Ramps	7.665	56	301	2.74
	PM TOTAL		14,072	37,632	**403.58**
	TOTAL DAILY CO REDUCTION (kg)				**808.26**
	TOTAL ANNUAL CO REDUCTION (kg)				**202,066**

4.0 INTERSECTION IMPACTS AND MITIGATION

4.1 INTRODUCTION

This section provides an updated analysis of roadway intersections on or near Main Campus that may be impacted by the Development Plan. Intersection level of service analysis was undertaken for existing conditions based on traffic counts collected in the Fall of 2023. Analysis of existing conditions and projections for 2030, with and without the Development Plan (Build and No-Build conditions, respectively), were developed per the *Town of Chapel Hill Guidelines for Transportation Impact Analysis* (adopted on June 11, 2001). The methodology and assumptions are described, including development of background traffic data, trip generation, trip distribution, trip assignment, and level of service analyses. The same techniques, model, and assumptions used in the December 2019 report have been applied.

The basis for determining the impacts is the change in parking supply rather than the building projects contained in the Development Plan, in accordance with the *Transportation Impact Analysis Guidelines*. This is because, unlike a more typical project where the parking needs of the project are satisfied, increases in parking on Main Campus will be limited and will not correspond to growth in occupiable floor area (as discussed in Section 3.0). Furthermore, parking increases on Main Campus are not allocated to specific new buildings but added to the overall supply for allocation to the entire campus population.

As described in Section 2.0, the approved Development Plan limits the University to a net increase of 1,579 spaces on Main Campus. This comprises 4,061 surface spaces eliminated by projects and 5,640 new spaces, of which 5,425 are in decks. As discussed in Section 2.0, a number of parking changes were proposed as part of Modification No. 3 to the Development Plan. The impact analysis takes into account the location of the losses and gains resulting from those modifications. Since the submission of Modification No. 3, five of the parking facilities identified in the Development Plan have opened for use (Cobb Deck, Jackson Circle Deck, Global Education Deck, Bell Tower Deck, and expansion of the Craige Deck). Additional changes not identified in the Development Plan include closure of the CH Helipad Lot in 2018, and redevelopment of the Surgical Tower and Public Safety (S1) parking facilities.

The study area network of streets and intersections is displayed in Figure 4-1. In the February 2006 TIA Update, 47 intersections were identified for the analysis. After assessing intersections on NC 54 east of campus, NC 86 north of campus, and US 15-501 south of campus, the University and Town agreed that eight additional intersections satisfied the criteria for inclusion in the analyses for Modification No. 3 of the University Development Plan Traffic Impact Analysis, published in December 2006. All of those same intersections are included in the analysis of this update of the Development Plan and are listed in Section 4.3.

Figure 4-1: Study Area Roadways and Intersections

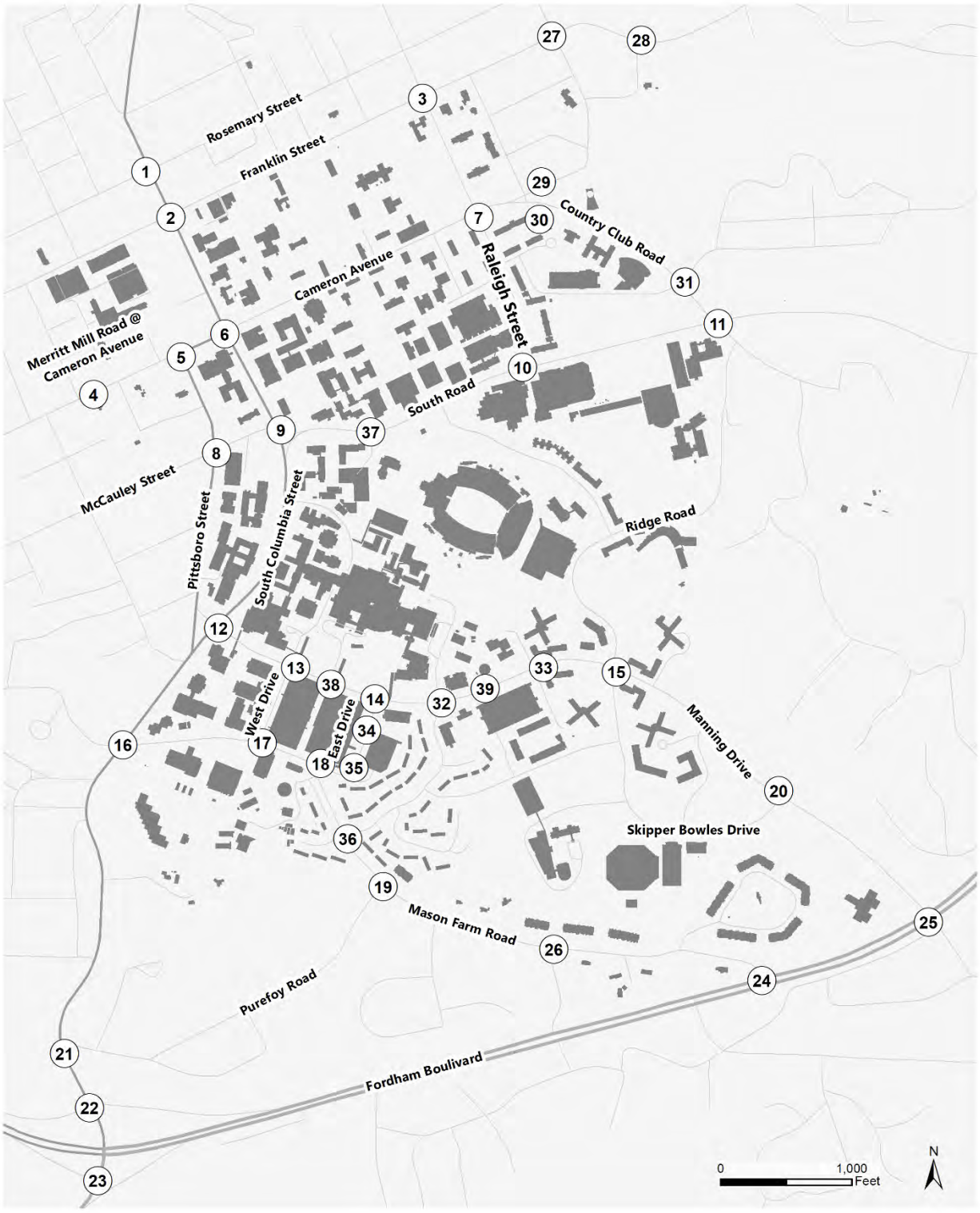


Figure 4-1: Study Area Roadways and Intersections (Continued)

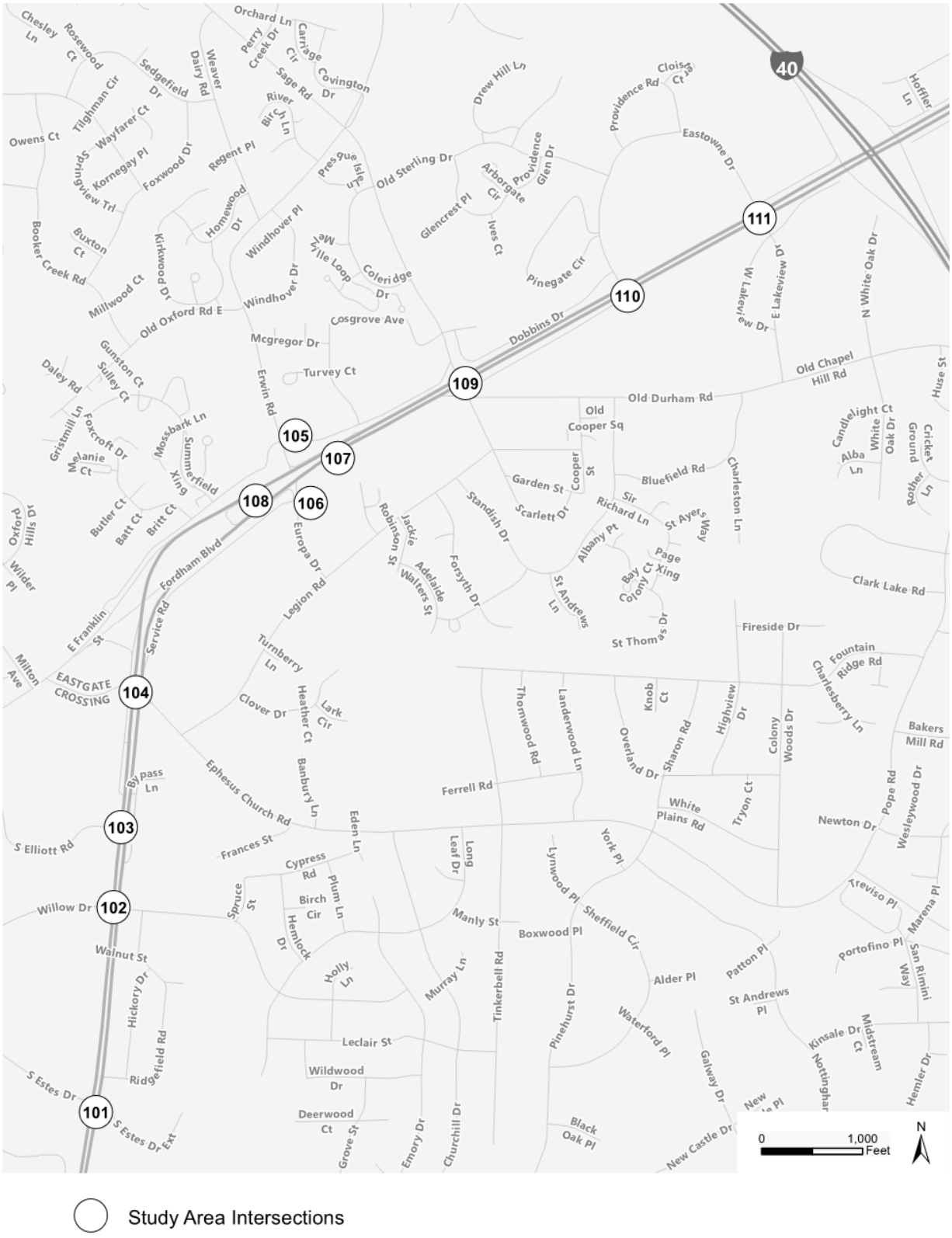
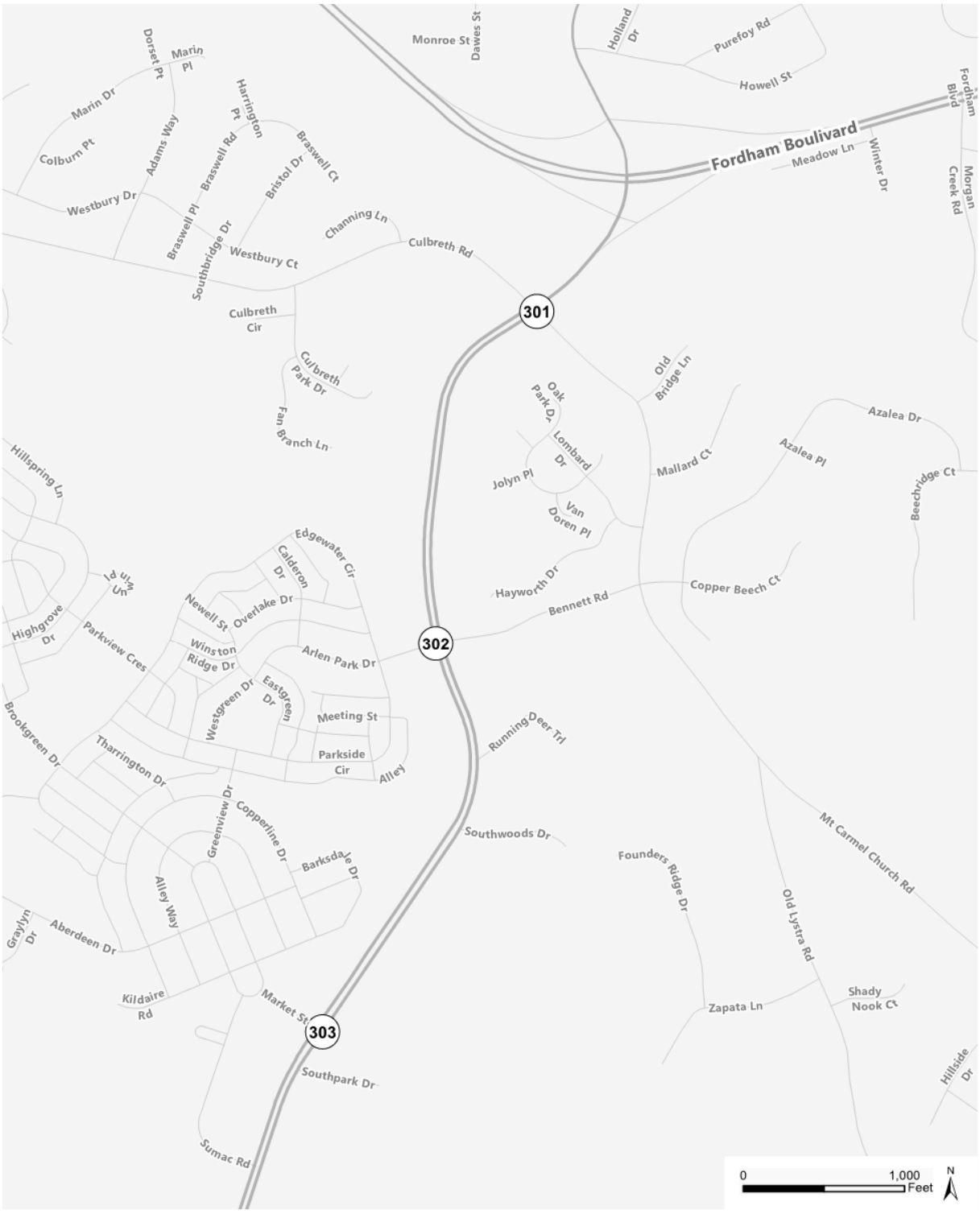


Figure 4-1: Study Area Roadways and Intersections (Continued)



Figure 4-1: Study Area Roadways and Intersections (Continued)



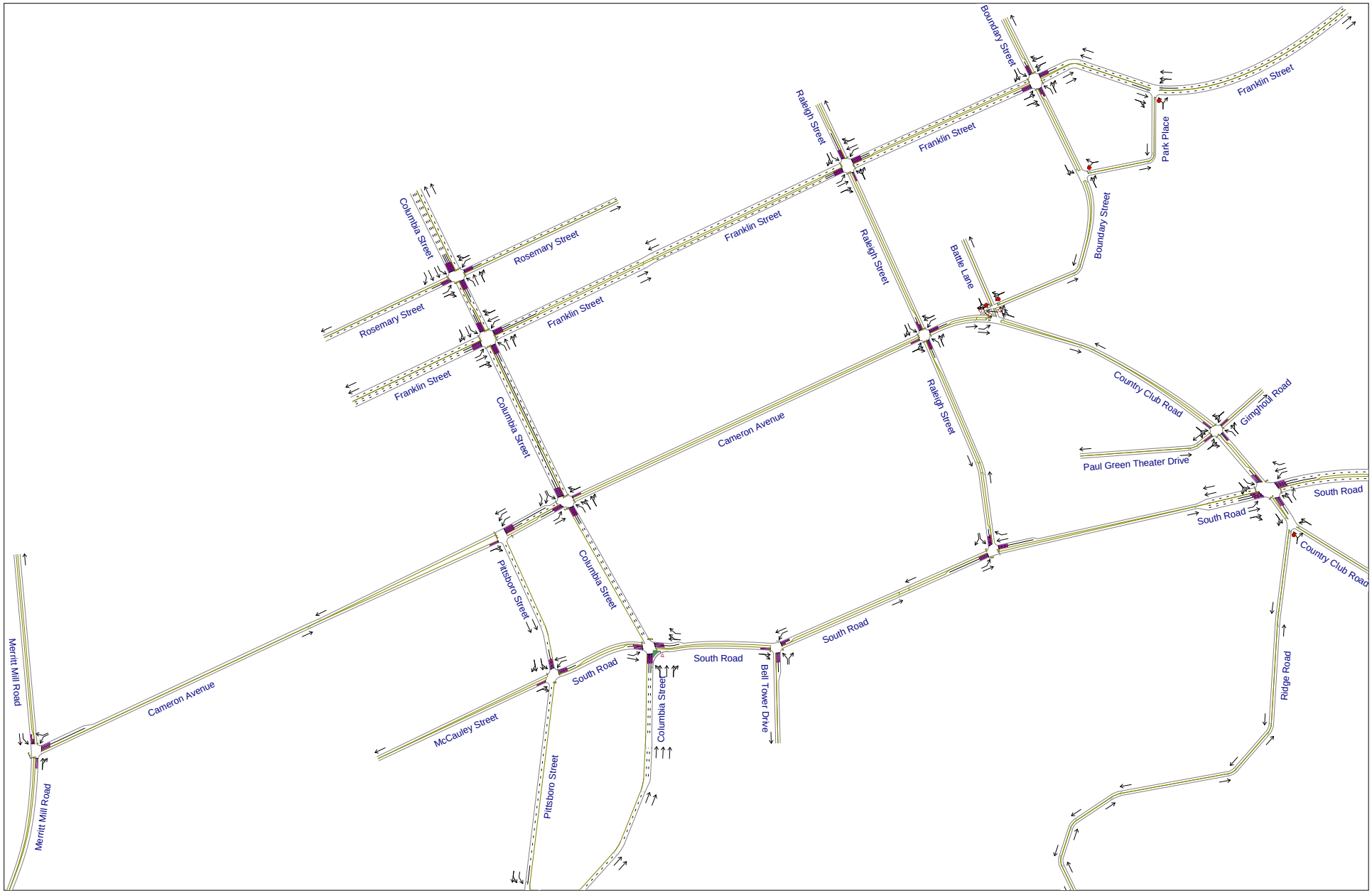


Figure 4-2a
Study Area Intersections and Roadway Graphics

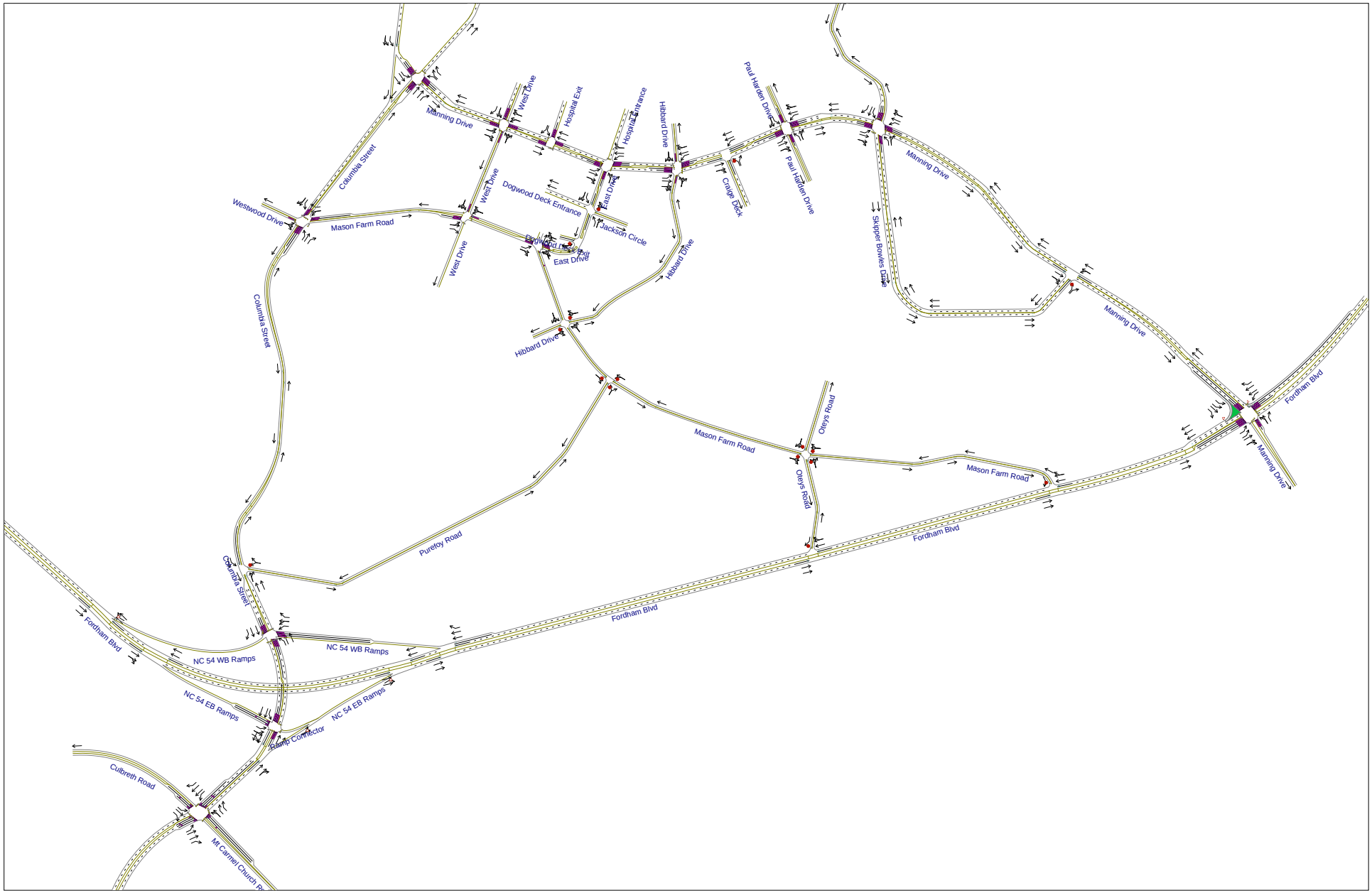


Figure 4-2b
Study Area Intersections and Roadway Graphics

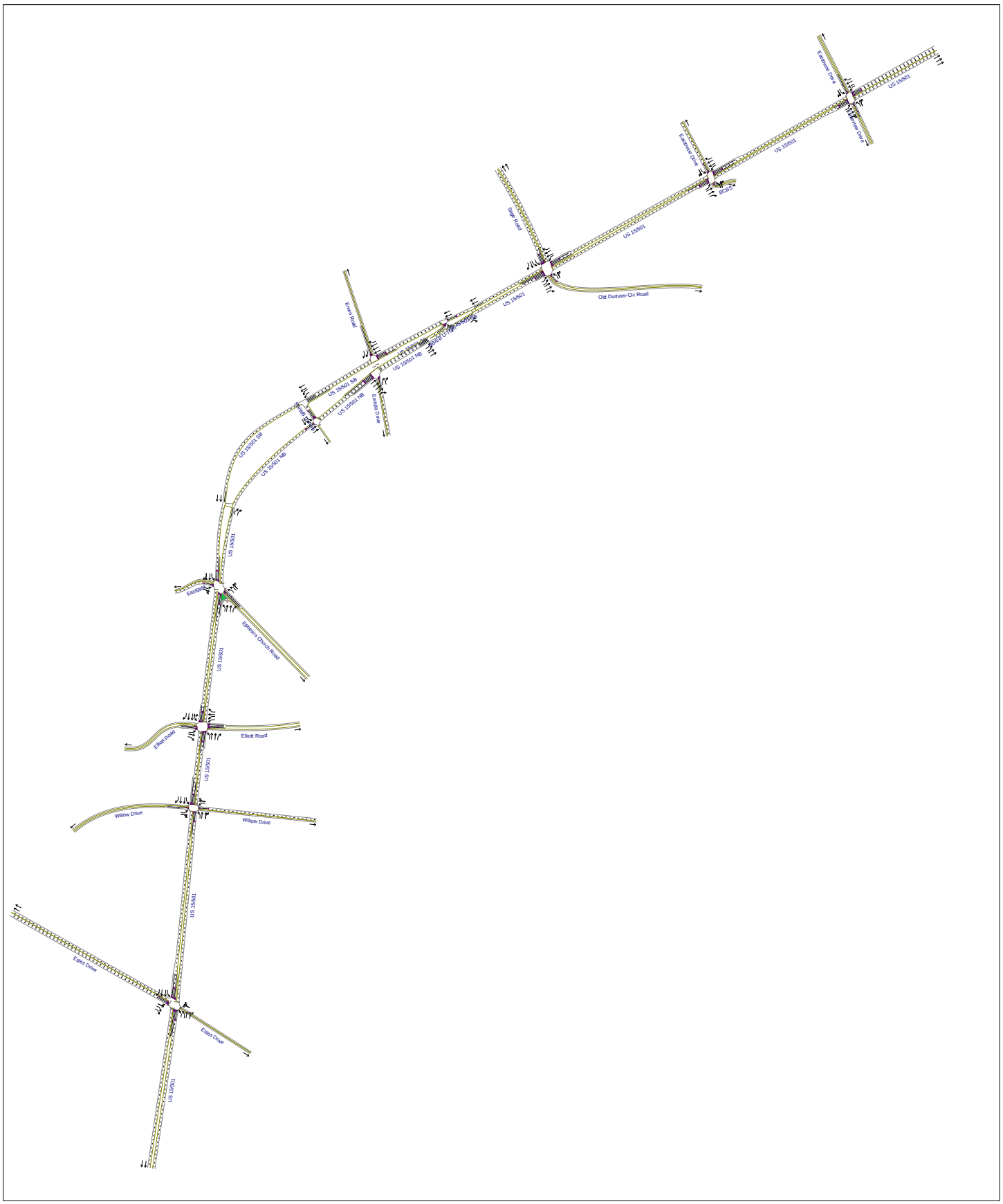


Figure 4-2c
Study Area Intersections and Roadway Graphics

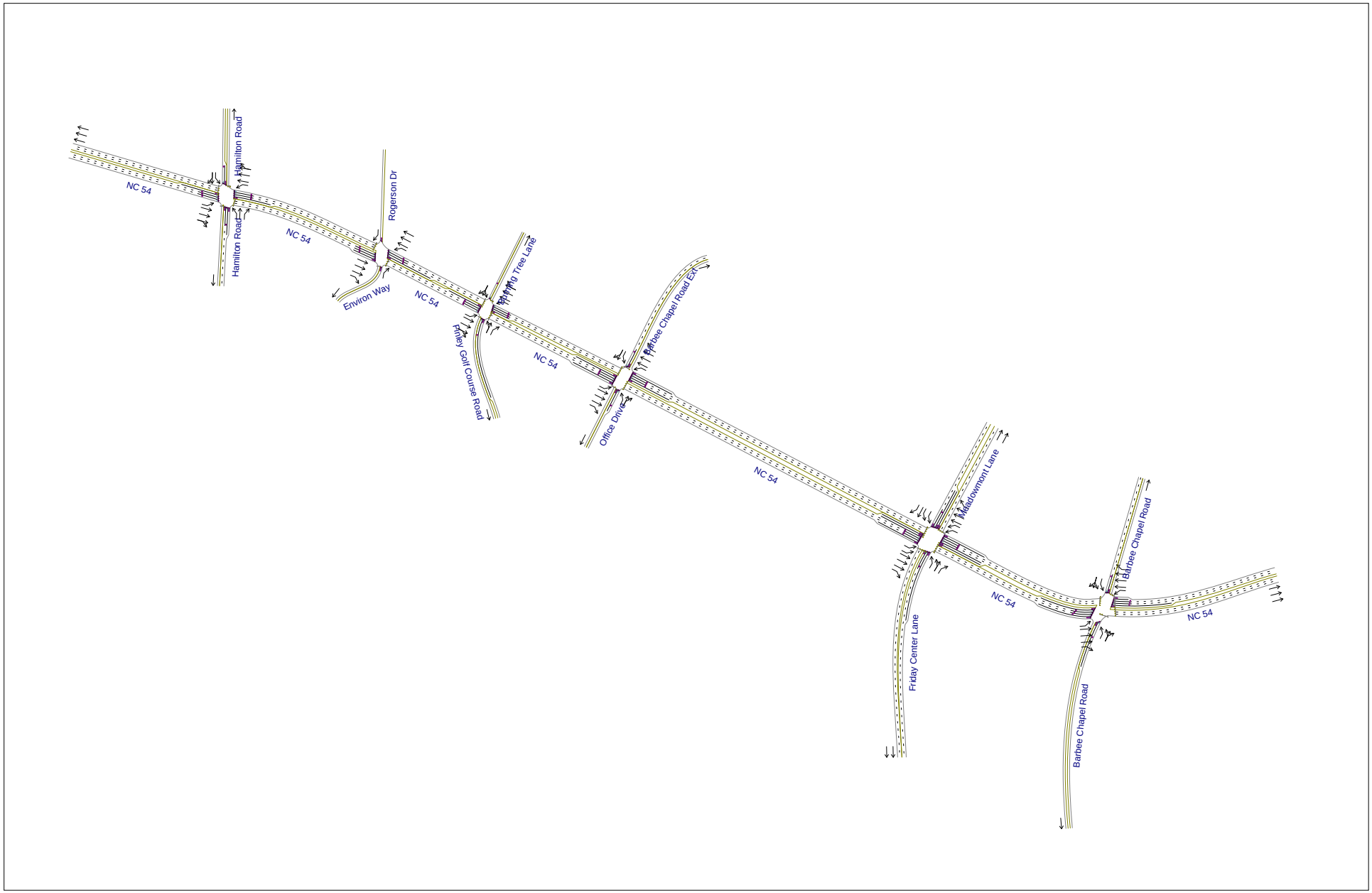


Figure 4-2d
Study Area Intersections and Roadway Graphics

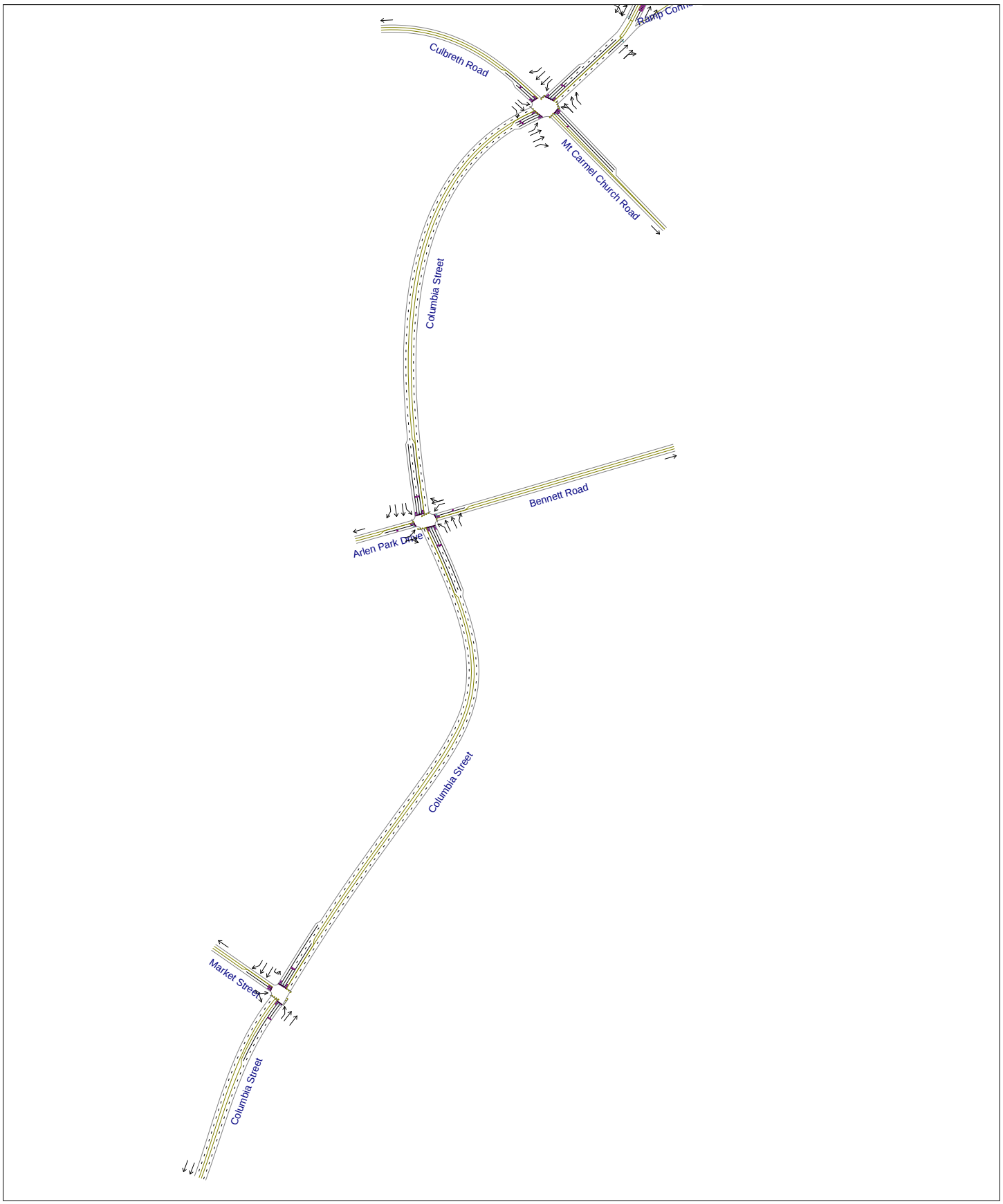


Figure 4-2e
Study Area Intersections and Roadway Graphics

4.2 EXISTING CONDITIONS

4.2.1 Campus Access and Study Area

The study area network of streets and intersections is displayed in Figure 4-1. Roadway and intersection geometric data were collected by field investigations and reviewing traffic signal plans provided by the NCDOT and the Town of Chapel Hill. Figure 4-2 shows the study area and intersection geometrics used in the analysis.

4.2.2 Existing Roads

This section describes the existing streets within the vicinity of Campus. As shown in Figure 4-1, there are several routes into and out of Campus. In addition, there is good interconnectivity of streets within Campus. Regional access to Campus is provided primarily via NC 54 (Raleigh Road from the east and West Franklin Street from the west), US 15-501 (South Columbia Street and Fordham Boulevard from the south and East Franklin Street from the northeast), and NC Route 86 (North Columbia Street/Martin Luther King, Jr. Boulevard from the north).

The major corridors on Campus include South Columbia Street, Raleigh Street, Cameron Avenue (east and west of South Columbia Street), South Road, and Manning Drive. McCauley Street is an essential link from southbound Pittsboro Street to South Road leading east, and from South Road to southbound Pittsboro Street. Similarly, Battle Lane, Boundary Street, and Park Place provide an alternate route to Franklin Street from the east thereby reducing traffic volumes on sections of Raleigh Street.

Country Club Road and Ridge Road are important inter-connecting roads along the eastern edge of Campus. Several other roads including Stadium Drive, West Drive, East Drive and Skipper Bowles Drive are included in the intra-campus circulation network, all providing access to major parking facilities.

Several of these roads also serve as major routes for traffic passing through Campus (including traffic destined for the Central Business District of the Town). South Columbia Street, South Road, and Country Club Road are, by virtue of their location in the regional network, particularly convenient for through traffic.

The majority of the roads are two- and four-lane undivided roads. South Columbia Street is a four-lane roadway north of Cameron Avenue. Between Manning Drive and Cameron Avenue, South Columbia Street is the northbound component of a one-way road pair, which also includes southbound Pittsboro Street. This section of South Columbia Street comprises two to three lanes. Pittsboro Street is a two-lane road along its entire length.

Other multi-lane roadways include Manning Drive (four lanes) and Franklin Street (four lanes). Although South Road serves as a major campus road, it is only a two-lane facility through Campus.

Average Daily Traffic (ADT) counts were collected during the Fall of 2023 for Campus study area roadways. The count stations used were the same as those used in the 2019 TIA Update. Utilizing historical traffic data for the study area, historical growth rate estimates were determined for the study area roadways between the years of 1989 to 2023 (see Table 4-1). The 2023 daily volumes are also shown in Figure 4-3.

Table 4-1: Existing and Historical Average Daily Traffic Volumes

Link #	Roadway	Average Daily Traffic Volumes (ADT)													Annual Growth 1989 - 2023	Annual Growth 2001 - 2023
		1989	2001	2003	2005	2006	2007	2009	2011	2013	2015	2017	2019	2023		
1	S. Columbia St. (south of Franklin St.)	15,300	20,720	19,060	17,530	-	17,530	15,410	14,380	14,660	16,330	15,780	15,220	12,996	-0.4%	-1.7%
2	Raleigh St. (south of Franklin St.)	10,700	14,470	10,710	13,080	13,080	11,020	11,710	9,910	10,510	10,450	11,030	10,175	10,543	0.0%	-1.2%
3	Cameron Ave. (west of Pittsboro St.)	9,000	9,820	8,300	8,510	-	7,630	9,260	7,220	6,690	7,560	7,710	6,265	6,230	-0.9%	-1.7%
4	Cameron Ave. (east of S. Columbia St.)	6,100	9,070	8,330	6,430	6,430	5,270	5,540	5,910	4,680	4,880	4,620	4,327	5,780	-0.2%	-1.8%
5	Country Club Rd. (north of South Rd.)	11,500	13,470	14,080	12,200	12,200	12,990	11,960	11,260	10,730	12,530	13,060	12,945	13,024	0.4%	-0.2%
6	South Rd. (east of Columbia St.)	11,500	10,460	8,840	11,400	-	8,400	7,430	8,370	8,590	9,650	9,210	9,561	9,082	-0.6%	-0.6%
7	South Rd. (east of Raleigh St.)	8,300	9,840	10,000	12,890	12,890	7,500	7,510	7,730	7,940	7,740	7,800	8,337	7,855	-0.2%	-0.9%
8	Pittsboro St. (south of McCauley St.)	8,500	10,960	10,070	10,920	-	9,550	9,750	8,810	8,060	8,490	8,630	9,087	8,196	-0.1%	-1.1%
9	Manning Dr. (east of Columbia St.)	10,900	14,100	13,220	12,480	12,480	11,070	11,060	10,020	10,710	11,300	11,830	10,565	8,794	-0.6%	-1.7%
10	Ridge Rd. (north of Manning Dr.)	7,200	8,320	7,870	7,300	7,300	7,910	8,730	8,110	7,820	7,220	7,590	7,524	7,132	0.0%	-0.6%
11	S. Columbia St. (south of Mason Farm Rd.)	12,300	18,470	18,250	16,190	-	16,090	15,430	14,760	13,980	15,480	16,290	16,626	15,653	0.8%	-0.7%
12	Manning Dr. (east of Ridge Rd.)	11,100	17,260	14,680	17,880	17,880	15,680	16,150	14,660	15,730	15,880	17,020	16,444	15,346	1.1%	-0.5%
13	Franklin St. (west of Raleigh St.)	16,600	17,000	19,260	18,850	-	19,320	16,250	14,370	14,610	14,900	16,230	15,987	15,975	-0.1%	-0.3%
14	Franklin St. (east of Boundary St.)	22,800	-	23,560	20,190	20,190	24,730	17,390	16,770	16,610	16,620	16,330	16,557	17,940	-0.8%	N/A
15	Boundary St. (south of Franklin St.)	-	-	3,230	2,320	2,320	2,140	2,230	2,400	2,230	2,010	2,580	2,042	1,878	N/A	N/A
16	Mason Farm Rd.(east of S. Columbia St.)	5,700	7,700	8,230	3,400	3,400	8,390	7,330	6,910	6,310	6,760	6,750	6,948	6,584	0.5%	-0.7%
17	Mason Farm Rd. (north of Fordham Blvd.)	-	1,360	770	1,830	-	1,820	1,770	1,730	1,720	1,550	1,600	1,814	1,578	N/A	0.7%
18	Purefoy Rd. (east of Columbia St.)	-	970	970	1,130	-	1,360	1,450	2,070	1,710	1,750	2,040	1,723	1,448	N/A	2.2%
19	US 15-501 (west of Main St.)	-	-	-	-	-	17,840	17,080	16,770	19,990	20,800	22,590	22,513	20,956	N/A	N/A
20	US 15-501 (east of Culbreth Rd.)	-	30,480	-	30,000	-	30,310	30,570	28,390	31,870	35,430	38,240	38,245	35,362	N/A	0.7%
21	NC 54 (west of Hamilton Rd.)	-	45,400	-	44,000	-	47,940	43,470	41,230	41,390	48,290	51,100	51,879	48,506	N/A	0.3%
22	NC 54 (east of East Barbee Chapel Hill Rd.)	-	-	-	-	-	32,100	37,390	36,320	39,970	44,170	46,880	47,247	44,547	N/A	N/A

NOTES:

1. All volumes are typical weekday (24-hour). Existing volumes (2003) are based on fall 2003 collected counts.
2. All yearly volumes 1990-1999 from NCDOT. For Links 16-18, year 2001 ADT estimated using calculated 2003 peak to daily ratio (K-factor). Year 1989 volumes taken from June 1990 Parking Decks Study for The University of North Carolina at Chapel Hill.

Recounted January 2008

Figure 4-3: Year 2023 Average Daily Traffic Volumes

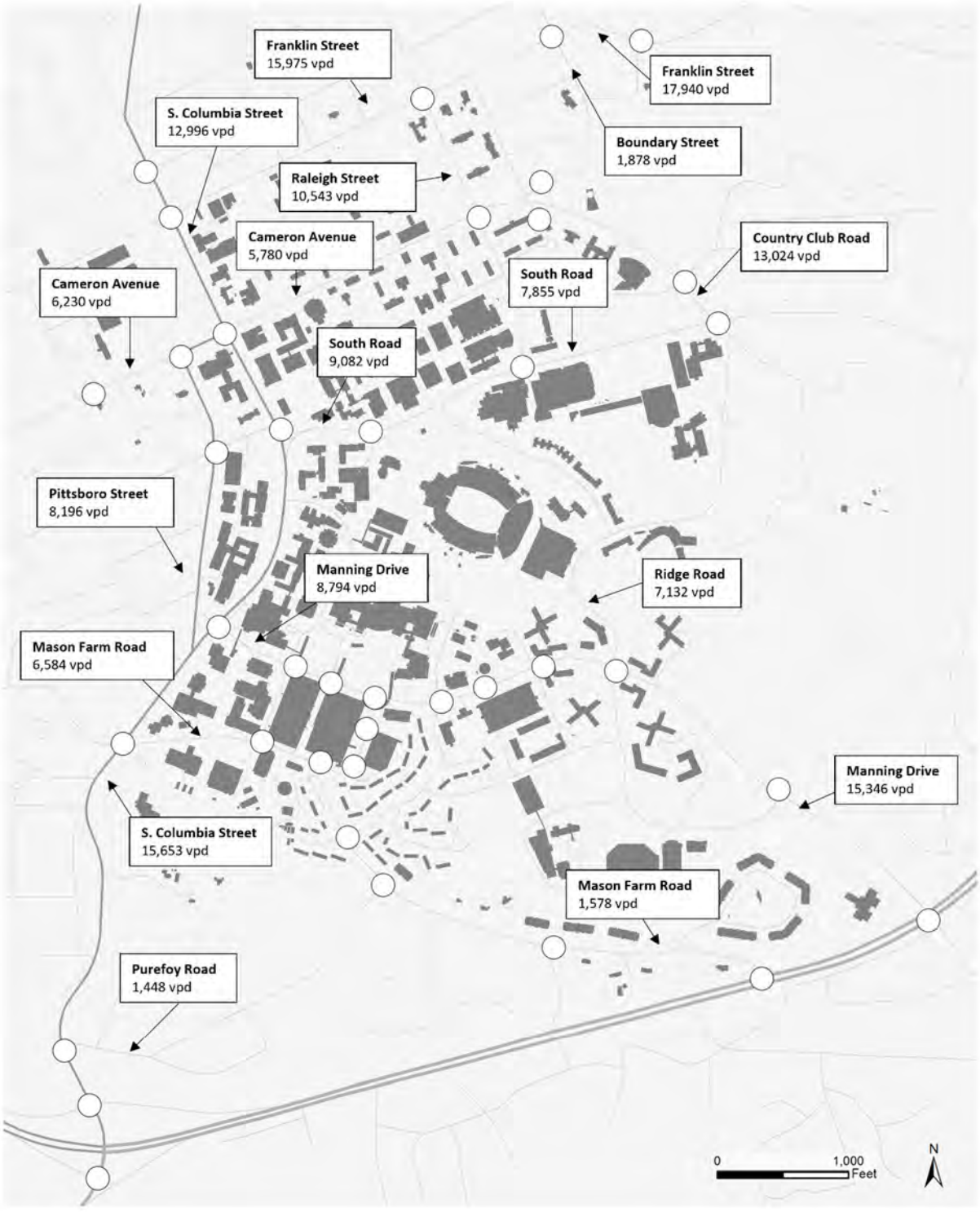


Figure 4-3: Year 2023 Average Daily Traffic Volumes (Continued)



Figure 4-3: Year 2023 Average Daily Traffic Volumes (Continued)



4.3 *EXISTING INTERSECTION LEVEL OF SERVICE ANALYSIS*

Per the *Transportation Impact Analysis Guidelines*, the following intersections were identified for traffic impact and analyzed for the Existing, No-Build (year 2030 conditions without the development), and Build (with the Development Plan implemented) conditions. Since Modification No. 3, the number of intersections included in these analyses was expanded to the 59 intersections listed below:

1. South Columbia Street & Rosemary Street (signalized)
2. South Columbia Street & Franklin Street (signalized)
3. Franklin Street & Raleigh Street (signalized)
4. Merritt Mill Road & Cameron Avenue (signalized)
5. Cameron Avenue & Pittsboro Street (signalized)
6. Cameron Avenue & South Columbia Street (signalized)
7. Cameron Avenue & Raleigh Street (signalized)
8. Pittsboro Street & McCauley Street (signalized)
9. South Columbia Street & South Road (signalized)
10. Raleigh Street & South Road (signalized)
11. Country Club Road & South Road (signalized)
12. South Columbia Street & Manning Drive (signalized)
13. Manning Drive & West Dive (signalized)
14. Manning Drive & East Drive (signalized)
15. Ridge Road & Manning Drive (signalized)
16. Mason Farm Road & South Columbia Street (signalized)
17. Mason Farm Road & West Drive (signalized)
18. Mason Farm Road & New East Drive (signalized)
19. Mason Farm Road & Purefoy Road (unsignalized)
20. Manning Drive & Skipper Bowles Drive (unsignalized)
21. South Columbia Street & Purefoy Road (unsignalized)
22. South Columbia Street & Fordham Boulevard WB Ramps (signalized)
23. South Columbia Street & Fordham Boulevard EB Ramps (signalized)
24. Mason Farm Road & Fordham Boulevard (unsignalized)
25. Manning Drive & Fordham Boulevard (signalized)
26. Mason Farm Road & Oteys Road (unsignalized)
27. Franklin Street & Boundary Street (signalized)
28. Franklin Street & Park Place (unsignalized)
29. Boundary Street & Battle Lane (unsignalized)
30. Country Club Road & Battle Lane (unsignalized)
31. Paul Green Theater Drive & Country Club Road (signalized)
32. Manning Drive & Hibbard Drive (signalized)
33. Manning Drive & Craig Drive (signalized)
34. Dogwood Deck Entrance & New East Drive (unsignalized)
35. Dogwood Deck Exit & New East Drive (unsignalized)
36. Hibbard Drive & Mason Farm Road (unsignalized)
37. South Road & Bell Tower Drive (signalized)
38. Manning Drive & Old East Drive (signalized)
39. Manning Drive & Craige Deck (unsignalized)
101. US 15-501 & Estes Drive (signalized)
102. US 15-501 & Willow Drive (signalized)
103. US 15-501 & Elliott Road (signalized)
104. US 15-501 & Eastgate/Ephesus Church Road (signalized)

105. US 15-501 & Erwin Road (signalized)
106. US 15-501 & Europa Drive (signalized)
107. US 15-501 & Northbound U-turn (signalized)
108. US 15-501 & Southbound U-turn (signalized)
109. US 15-501 & Sage Road (signalized)
110. US 15-501 & Eastowne Drive/BCBS (signalized)
111. US 15-501 & Eastowne Drive/Lakeview Drive (signalized)
201. Raleigh Road (NC 54) & Hamilton Street (signalized)
202. Raleigh Road (NC 54) & Burning Tree Lane (signalized)
203. Raleigh Road (NC 54) & West Barbee Chapel Road (signalized)
204. Raleigh Road (NC 54) & Meadowmont Lane (signalized)
205. Raleigh Road (NC 54) & East Barbee Chapel Road (signalized)
301. US 15-501 & Culbreth Road (signalized)
302. US 15-501 & Bennett Road (signalized)
303. US 15-501 & Main Street (Southern Village) (signalized)
307. Country Club Road & Boundary Street (unsignalized)

Existing roadway geometry for all of the above intersections can be found in Figure 4-2.

4.3.1 Count Data

For the analyses included in this update, peak hour turning movement volume counts were collected for Campus study area intersections during the Fall of 2023 on typical weekdays (Tuesday, Wednesday, Thursday) while the University was in session. A summary of the schedule used to obtain the turning movement data is provided in Table 4-2. The AM and PM peak hour turning movement volumes are summarized in Table 4-3 and displayed in Figure 4-4 and Figure 4-5, respectively.

Table 4-2: Weekday Peak Period Turning Movement Schedule

ID #	Intersection	Day of Week	Date
1	Columbia Street/Rosemary Street	Tuesday	9/26/23
2	Columbia Street/Franklin Street	Tuesday	9/26/23
3	Franklin Street/Raleigh Street	Tuesday	9/26/23
4	Merritt Mill Road/Cameron Avenue	Tuesday	10/3/23
5	Cameron Avenue/Pittsboro Street	Thursday	10/5/23
6	Cameron Avenue/Columbia Street	Wednesday	9/20/23
7	Cameron Avenue/Raleigh Street	Wednesday	9/20/23
8	Pittsboro Street/McCauley Street	Wednesday	9/20/23
9	Columbia Street/South Road	Wednesday	9/20/23
10	Raleigh Street/South Road	Wednesday	9/20/23
11	Country Club Road/South Road	Wednesday	9/20/23
12	Columbia Street/Manning Drive	Thursday	10/5/23
13	Manning Drive/West Drive	Thursday	10/5/23
14	Manning Drive/East Drive	Thursday	9/21/23
15	Ridge Road/Manning Drive	Thursday	9/21/23
16	Mason Farm Road/Columbia Street	Tuesday	9/26/23
17	Mason Farm Road/West Drive	Tuesday	9/26/23
18	Mason Farm Road/East Drive	Tuesday	10/3/23
19	Mason Farm Road/Purefoy Road	Tuesday	10/3/23
20	Manning Drive/Skipper Bowles Drive	Tuesday	9/26/23
21	Columbia Street/Purefoy Road	Wednesday	10/4/23
22	Columbia Street/Fordham Boulevard WB Ramps	Wednesday	10/4/23
23	Columbia Street/Fordham Boulevard EB Ramps	Wednesday	10/4/23
24	Mason Farm Road/Fordham Boulevard	Wednesday	10/4/23
25	Manning Drive/Fordham Boulevard	Thursday	10/5/23
26	Mason Farm Road/Oteys Road	Thursday	10/26/23
27	Franklin Street/Boundary Street	Wednesday	10/4/23
28	Franklin Street/Park Place	Wednesday	10/4/23
29	Battle Lane/Boundary Street	Thursday	10/5/23
30	Country Club Road/Battle Lane	Thursday	10/5/23
31	Country Club Road/Gimghoul Road	Wednesday	9/20/23
32	Manning Drive/Hibbard Drive	Tuesday	9/26/23
33	Manning Drive/Craige Drive	Tuesday	9/26/23
34	East Drive/Jackson Circle/Dogwood Deck Entrance	Tuesday	9/26/23
35	East Drive/Dogwood Deck Exit	Tuesday	9/26/23
36	Mason Farm Road/Hibbard Drive	Tuesday	9/26/23
37	South Road/Bell Tower Drive	Wednesday	9/20/23
38	Manning Drive/New East Drive	Thursday	9/21/23
39	Manning Drive/Craige Deck	Thursday	9/21/23
101	US 15-501/Estes Drive	Wednesday	10/4/23
102	US 15-501/Willow Drive	Tuesday	9/26/23
103	US 15-501/Elliot Road	Tuesday	9/26/23
104	US 15-501/Ephesus Church Road	Wednesday	10/4/23
105	US 15-501/Erwin Road	Thursday	10/5/23
106	US 15-501/Europa Drive	Thursday	10/5/23
107	US 15-501/Superstreet NB U-Turn	Thursday	10/5/23
108	US 15-501/Superstreet SB U-Turn	Thursday	10/26/23
109	US 15-501/Sage Road	Wednesday	10/4/23
110	US 15-501/Eastowne Drive/BCBS	Tuesday	9/26/23
111	US 15-501/Eastowne Drive/Lakeview Drive	Tuesday	9/26/23
201	NC 54/Hamilton Road	Tuesday	9/19/23
202	NC 54/Burning Tree Lane	Tuesday	10/3/23
203	NC 54/Barbee Chapel Road Ext	Thursday	10/5/23
204	NC 54/Meadowmont Lane	Tuesday	9/19/23
205	NC 54/Barbee Chapel Road (East)	Thursday	10/5/23
206	NC 54/US 15-501 NB Ramps	Tuesday	10/3/23
207	NC 54/US 15-501 SB Ramps	Tuesday	10/3/23
208	NC 54/Shopping Center/Rogerson Drive	Tuesday	9/19/23
301	US 15-501/Culbreth Road/Mt Carmel Church Road	Tuesday	10/3/23
302	US 15-501/Bennett Road/Arlen Park Drive	Tuesday	9/26/23
303	US 15-501/Market Street	Tuesday	9/26/23

Table 4-3: Year 2023 Turning Movement Volumes

AM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
1	Columbia Street/Rosemary Street	93	1	73	17	5	6	77	311	31	0	23	430	100
2	Columbia Street/Franklin Street	52	266	35	72	324	112	31	264	79	0	93	395	49
3	Franklin Street/Raleigh Street	14	294	104	59	399	133	123	179	36	0	44	291	25
4	Merritt Mill Road/Cameron Avenue	0	0	0	51	0	35	0	144	333	0	134	84	0
5	Cameron Avenue/Pittsboro Street	0	139	144	490	179	0	0	0	0	0	0	0	0
6	Cameron Avenue/Columbia Street	19	85	0	0	121	36	100	338	28	0	72	0	469
7	Cameron Avenue/Raleigh Street	17	59	29	31	159	266	32	41	12	0	267	150	48
8	Pittsboro Street/McCauley Street	0	108	24	170	54	0	0	0	0	0	88	467	8
9	Columbia Street/South Road	16	184	0	0	191	77	59	353	211	0	0	0	0
10	Raleigh Street/South Road	56	212	0	0	337	24	0	0	0	0	45	0	115
11	Country Club Road/South Road	5	174	32	453	386	480	19	40	38	0	267	159	11
12	Columbia Street/Manning Drive	78	334	0	57	0	146	0	429	185	0	0	0	0
13	Manning Drive/West Drive	26	360	106	94	180	13	14	12	7	0	8	9	15
14	Manning Drive/East Drive	66	277	137	209	202	53	47	21	194	0	0	0	0
15	Ridge Road/Manning Drive	78	221	55	8	473	67	9	39	5	0	32	142	294
16	Mason Farm Road/Columbia Street	2	1	6	111	2	62	8	584	456	0	128	224	3
17	Mason Farm Road/West Drive	143	314	11	5	132	38	0	0	0	0	30	6	19
18	Mason Farm Rod/East Drive	96	219	61	10	79	24	68	29	58	0	0	0	0
19	Mason Farm Road and Purefoy Road	136	0	33	0	0	0	9	146	0	0	0	39	8
20	Manning Drive/Skipper Bowles Drive	0	298	17	275	598	0	1	0	21	0	0	0	0
21	Columbia Street/Purefoy Road	0	0	0	26	0	4	0	1014	145	0	3	359	0
22	Columbia Street/Fordham Boulevard WB Ramps	0	0	0	529	3	63	173	1109	0	0	0	272	88
23	Columbia Street/Fordham Boulevard EB Ramps	323	3	321	0	0	0	0	878	0	0	61	798	0
24	Mason Farm Road/Fordham Boulevard	0	2372	0	0	1291	89	0	0	0	0	0	0	25
25	Manning Drive/Fordham Boulevard	185	2104	4	9	1306	727	17	5	37	0	176	2	43
26	Mason Farm Road/Oteys Road	46	20	11	2	97	18	35	1	1	0	3	3	21
27	Franklin Street/Boundary	11	290	13	55	602	71	3	18	17	0	42	19	8
28	Franklin Street/Park Place	0	345	2	34	725	0	0	0	10	0	0	0	0
29	Battle Lane/Boundary Street	0	0	0	50	41	0	0	65	36	0	0	55	14
30	Country Club Road/Battle Lane	42	303	0	0	365	101	0	0	0	0	105	0	0
307	Country Club Road/Boundary Street	0	345	0	0	365	0	0	0	0	0	0	0	55
31	Country Club Road/Gimghoul Road	2	0	10	6	1	6	56	524	4	0	8	389	24
32	Manning Drive/Hibbard Drive	48	444	16	13	407	33	4	16	12	0	35	10	44
33	Manning Drive/Craige Drive	7	370	18	154	626	28	8	10	25	0	23	1	9
34	East Drive/Jackson Circle/Dogwood Deck Entrance	0	0	0	1	0	1	17	282	4	0	56	98	207
35	East Drive/Dogwood Deck Exit	166	0	93	0	0	0	0	152	0	0	0	60	0
36	Mason Farm Road/Hibbard Drive	36	35	12	10	143	100	3	4	2	0	22	4	24
37	South Road/Bell Tower Drive	0	228	105	108	233	0	48	0	92	0	0	0	0
38	Manning Drive/New East Drive	0	393	0	0	246	0	0	0	0	0	89	0	32
39	Manning Drive/Craige Deck	0	348	130	177	430	0	10	0	20	0	0	0	0
101	US 15-501/Estes Drive	111	3	204	9	2	5	244	1177	5	0	2	1173	79
102	US 15-501/Willow Drive	61	13	22	50	36	35	145	1170	34	0	26	1277	245
103	US 15-501/Elliot Road	27	33	141	89	51	136	99	1096	54	5	68	1204	28
104	US 15-501/Ephesus Church Road	48	22	79	160	47	12	93	956	123	0	33	989	10
105	US 15-501/Erwin Road	0	0	0	0	1631	274	0	0	0	0	0	0	452
106	US 15-501/Europa Drive	0	1802	97	0	0	0	0	0	143	0	0	0	0
107	US 15-501/Superstreet NB U-Turn	0	0	0	0	1663	0	293	0	0	0	0	0	0
108	US 15-501/Superstreet SB U-Turn	0	1839	0	0	0	0	0	0	0	0	72	39	0
109	US 15-501/Sage Road	254	1191	100	92	1384	127	184	114	21	0	201	101	112
110	US 15-501/Eastowne Drive/BCBS	128	1312	10	38	1554	203	3	15	7	0	47	4	41
111	US 15-501/Eastowne Drive/Lakeview Drive	8	1362	3	84	1797	268	6	30	83	0	70	5	6
201	NC 54/Hamilton Road	24	1556	86	37	1934	25	128	25	57	0	59	33	26
202	NC 54/Burning Tree Lane	19	1595	42	174	1914	22	20	5	116	0	25	5	36
203	NC 54/Barbee Chapel Road Ext	140	1456	43	59	1996	33	16	0	1	0	8	1	109
204	NC 54/Meadowmont Lane	153	1310	111	383	1965	125	53	29	23	0	61	19	136
205	NC 54/Barbee Chapel Road (East)	17	1186	183	52	1861	160	510	73	55	0	105	27	21
301	US 15-501/Culbreth Road/Mt Carmel Church Road	203	85	43	19	81	565	40	1224	3	0	267	707	171
302	US 15-501/Bennett Road/Arlen Park Drive	85	18	6	62	17	7	3	1146	72	0	54	701	51
303	US 15-501/Market Street	205	0	41	0	0	0	147	924	0	5	0	469	301

Table 4-3: Year 2023 Turning Movement Volumes (Continued)

PM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
1	Columbia Street/Rosemary Street	188	13	150	22	9	24	148	428	27	0	18	319	176
2	Columbia Street/Franklin Street	114	447	67	126	414	204	53	279	98	0	214	223	64
3	Franklin Street/Raleigh Street	36	550	205	45	591	253	120	279	58	0	134	245	25
4	Merritt Mill Road/Cameron Avenue	0	0	0	305	0	187	0	137	164	0	65	276	0
5	Cameron Avenue/Pittsboro Street	0	147	152	458	371	0	0	0	0	0	0	0	0
6	Cameron Avenue/Columbia Street	19	122	0	0	189	42	199	462	63	0	103	0	408
7	Cameron Avenue/Raleigh Street	33	164	46	30	134	293	62	128	56	0	283	161	58
8	Pittsboro Street/McCauley Street	0	78	20	232	219	0	0	0	0	0	179	428	29
9	Columbia Street/South Road	38	237	0	0	319	175	120	495	126	0	0	0	0
10	Raleigh Street/South Road	88	303	0	0	290	86	0	0	0	0	72	0	144
11	Country Club Road/South Road	28	363	39	217	334	459	21	117	271	0	460	101	12
12	Columbia Street/Manning Drive	65	179	0	206	0	353	0	308	39	0	0	0	0
13	Manning Drive/West Drive	12	185	18	13	477	8	51	1	14	0	6	5	26
14	Manning Drive/East Drive	30	205	49	81	409	44	101	33	367	0	0	0	0
15	Ridge Road/Manning Drive	171	689	52	12	147	55	115	133	37	0	102	77	180
16	Mason Farm Road/Columbia Street	1	0	6	416	7	81	19	340	98	0	81	691	9
17	Mason Farm Road/West Drive	9	156	8	4	430	47	0	0	0	0	23	0	11
18	Mason Farm Rod/East Drive	17	210	88	92	207	11	67	3	26	0	0	0	0
19	Mason Farm Road and Purefoy Road	24	0	38	0	0	0	11	68	0	0	0	236	46
20	Manning Drive/Skipper Bowles Drive	0	813	12	45	184	0	11	0	190	0	0	0	0
21	Columbia Street/Purefoy Road	0	0	0	42	0	22	0	355	40	0	11	1083	0
22	Columbia Street/Fordham Boulevard WB Ramps	0	0	0	827	3	38	313	360	0	0	0	723	361
23	Columbia Street/Fordham Boulevard EB Ramps	108	0	256	0	0	0	0	580	0	0	95	1517	0
24	Mason Farm Road/Fordham Boulevard	0	1460	0	0	1977	47	0	0	0	0	0	0	108
25	Manning Drive/Fordham Boulevard	86	1475	1	14	1830	105	13	0	21	0	817	3	228
26	Mason Farm Road/Oteys Road	11	79	116	3	37	5	10	1	0	0	10	7	22
27	Franklin Street/Boundary	15	540	11	26	764	133	12	69	99	0	68	16	6
28	Franklin Street/Park Place	0	703	2	21	927	0	0	0	57	0	0	0	0
29	Battle Lane/Boundary Street	0	0	0	63	33	0	0	139	102	0	1	85	22
30	Country Club Road/Battle Lane	91	398	0	0	402	241	0	0	0	0	148	0	0
307	Country Club Road/Boundary Street	0	489	0	0	402	0	0	0	0	0	0	0	55
31	Country Club Road/Gimghoul Road	28	2	59	11	2	9	20	581	5	0	7	497	19
32	Manning Drive/Hibbard Drive	27	542	9	17	507	38	21	2	39	0	27	21	60
33	Manning Drive/Craige Drive	15	745	17	23	418	27	33	7	144	0	20	15	12
34	East Drive/Jackson Circle/Dogwood Deck Entrance	0	0	0	1	0	6	7	518	1	0	4	59	80
35	East Drive/Dogwood Deck Exit	232	0	156	0	0	0	0	207	0	0	0	60	0
36	Mason Farm Road/Hibbard Drive	16	164	1	0	74	34	3	3	10	0	129	0	37
37	South Road/Bell Tower Drive	0	314	33	36	350	0	128	0	102	0	0	0	0
38	Manning Drive/New East Drive	0	210	0	0	508	0	0	0	0	0	73	0	49
39	Manning Drive/Craige Deck	0	569	11	15	411	0	99	0	201	0	0	0	0
101	US 15-501/Estes Drive	196	5	359	5	6	9	254	1440	2	0	11	1219	105
102	US 15-501/Willow Drive	141	24	21	32	39	30	103	1451	81	0	41	1247	226
103	US 15-501/Elliot Road	104	80	217	61	77	137	209	1294	169	6	100	1124	128
104	US 15-501/Ephesus Church Road	116	49	118	240	74	24	177	1093	218	0	59	891	25
105	US 15-501/Erwin Road	0	0	0	0	1483	442	0	0	0	0	0	0	387
106	US 15-501/Europa Drive	0	2194	81	0	0	0	0	0	249	0	0	0	0
107	US 15-501/Superstreet NB U-Turn	0	0	0	0	1547	0	337	0	0	0	0	0	0
108	US 15-501/Superstreet SB U-Turn	0	2191	0	0	0	0	0	0	0	0	58	95	0
109	US 15-501/Sage Road	362	1462	233	83	1232	240	199	176	28	0	185	168	114
110	US 15-501/Eastowne Drive/BCBS	31	1664	15	90	1469	48	6	27	82	0	121	26	93
111	US 15-501/Eastowne Drive/Lakeview Drive	1	1863	9	80	1572	115	11	23	98	0	226	16	10
201	NC 54/Hamilton Road	24	2000	46	56	1610	37	143	14	85	0	117	14	29
202	NC 54/Burning Tree Lane	52	2348	20	184	1556	24	38	11	137	0	33	14	34
203	NC 54/Barbee Chapel Road Ext	156	2055	14	7	1879	12	42	11	42	0	28	1	133
204	NC 54/Meadowmont Lane	98	2040	37	31	1496	94	94	16	328	0	115	25	149
205	NC 54/Barbee Chapel Road (East)	10	1787	635	123	1514	155	286	77	55	0	101	87	24
301	US 15-501/Culbreth Road/Mt Carmel Church Road	102	82	49	22	82	385	40	760	5	0	454	1259	165
302	US 15-501/Bennett Road/Arlen Park Drive	70	13	3	78	15	4	12	658	99	0	49	1173	100
303	US 15-501/Market Street	306	0	116	0	0	0	112	442	0	9	0	1004	248

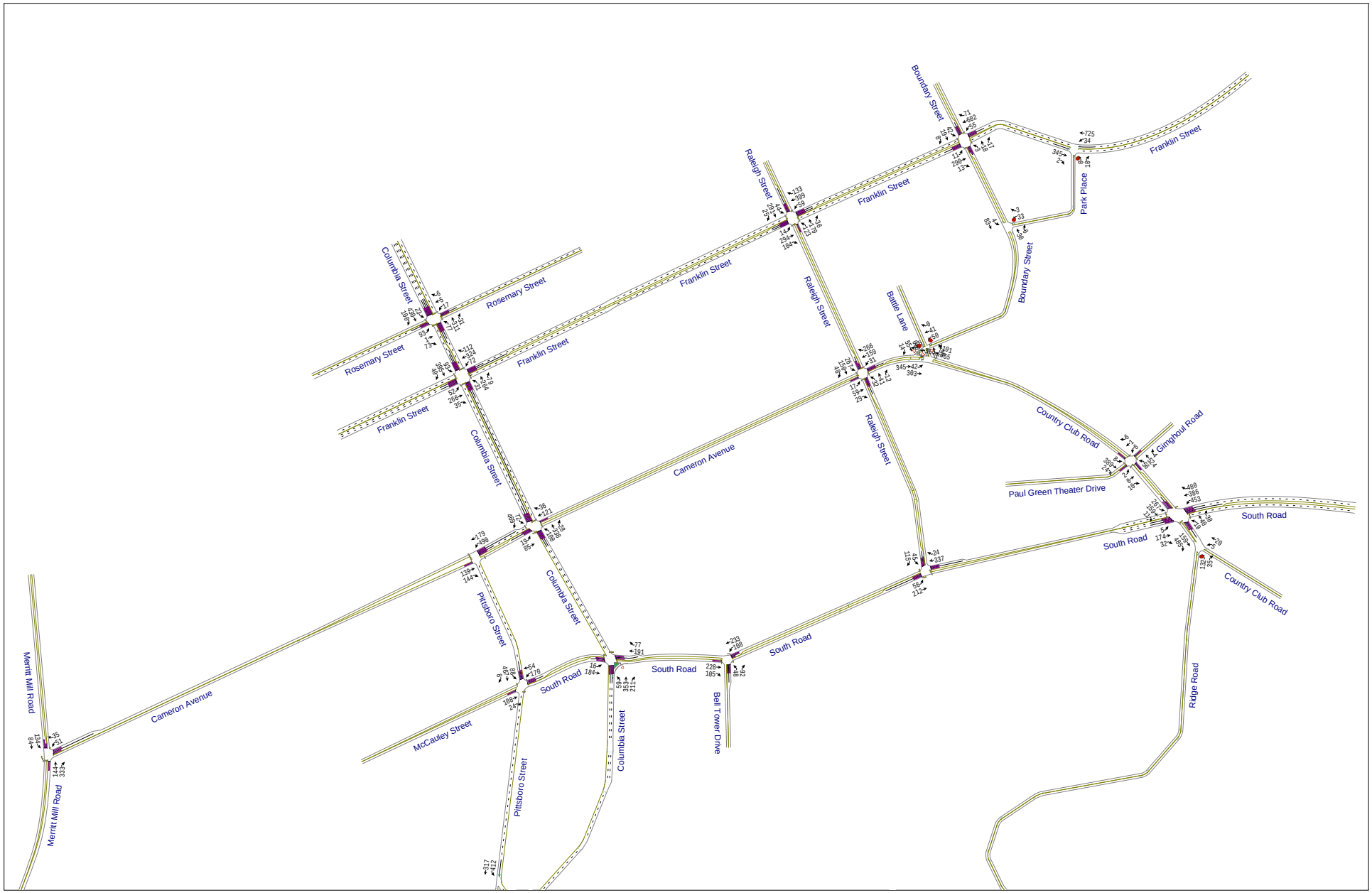


Figure 4-4a
Year 2023 A.M. Peak Hour Turning Movement Volumes

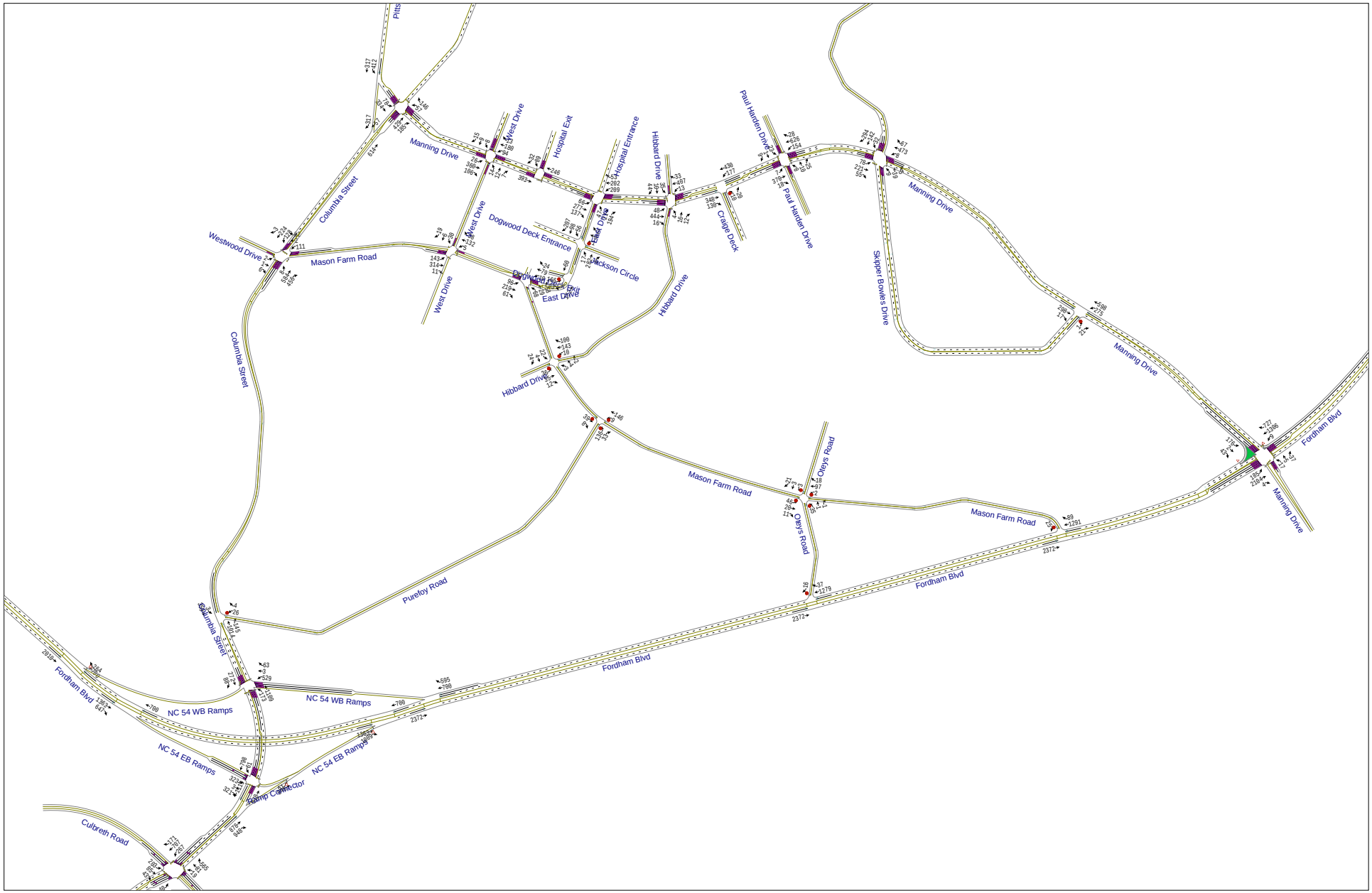


Figure 4-4b
Year 2023 A.M. Peak Hour Turning Movement Volumes

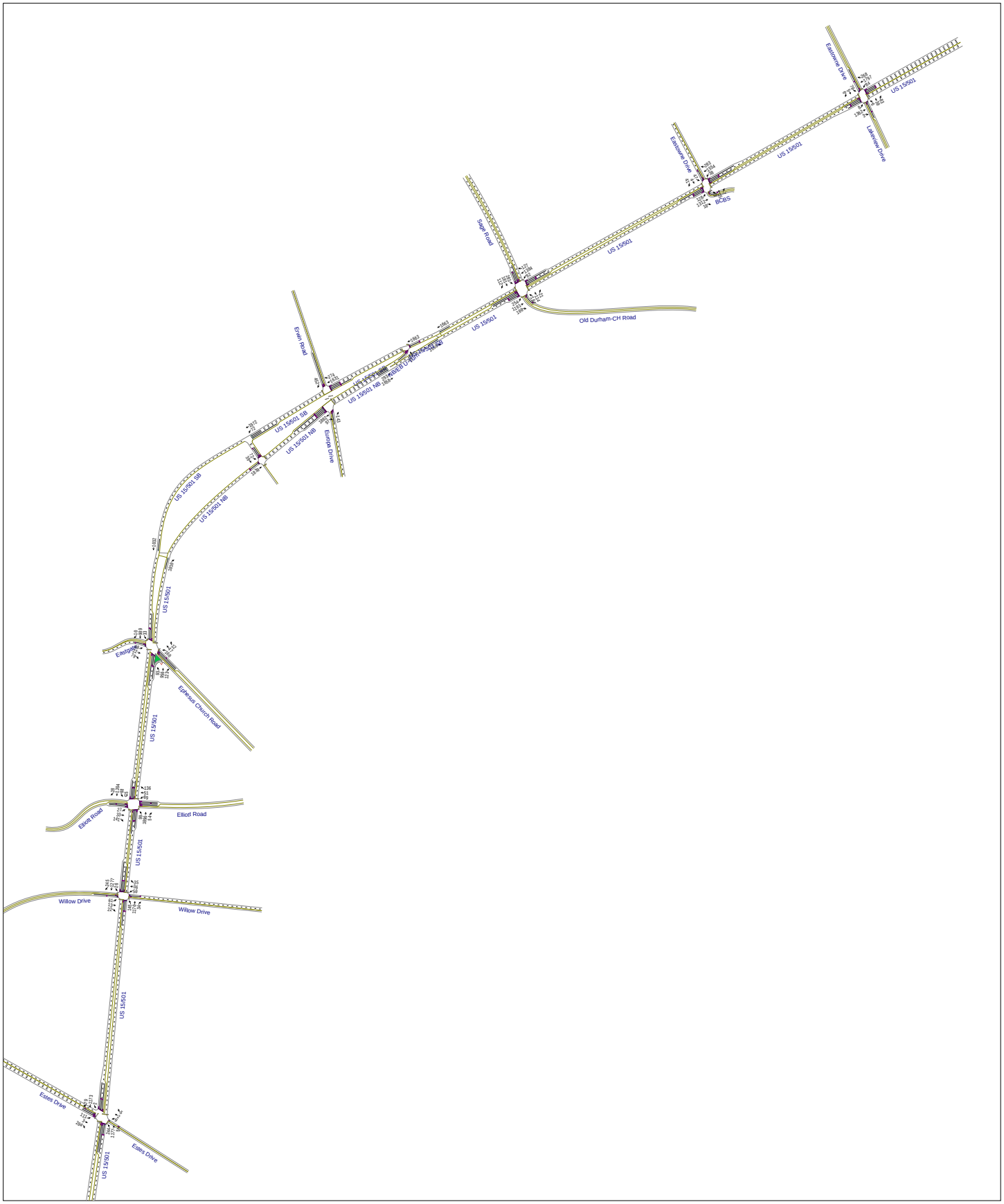


Figure 4-4c
Year 2023 A.M. Peak Hour Turning Movement Volumes

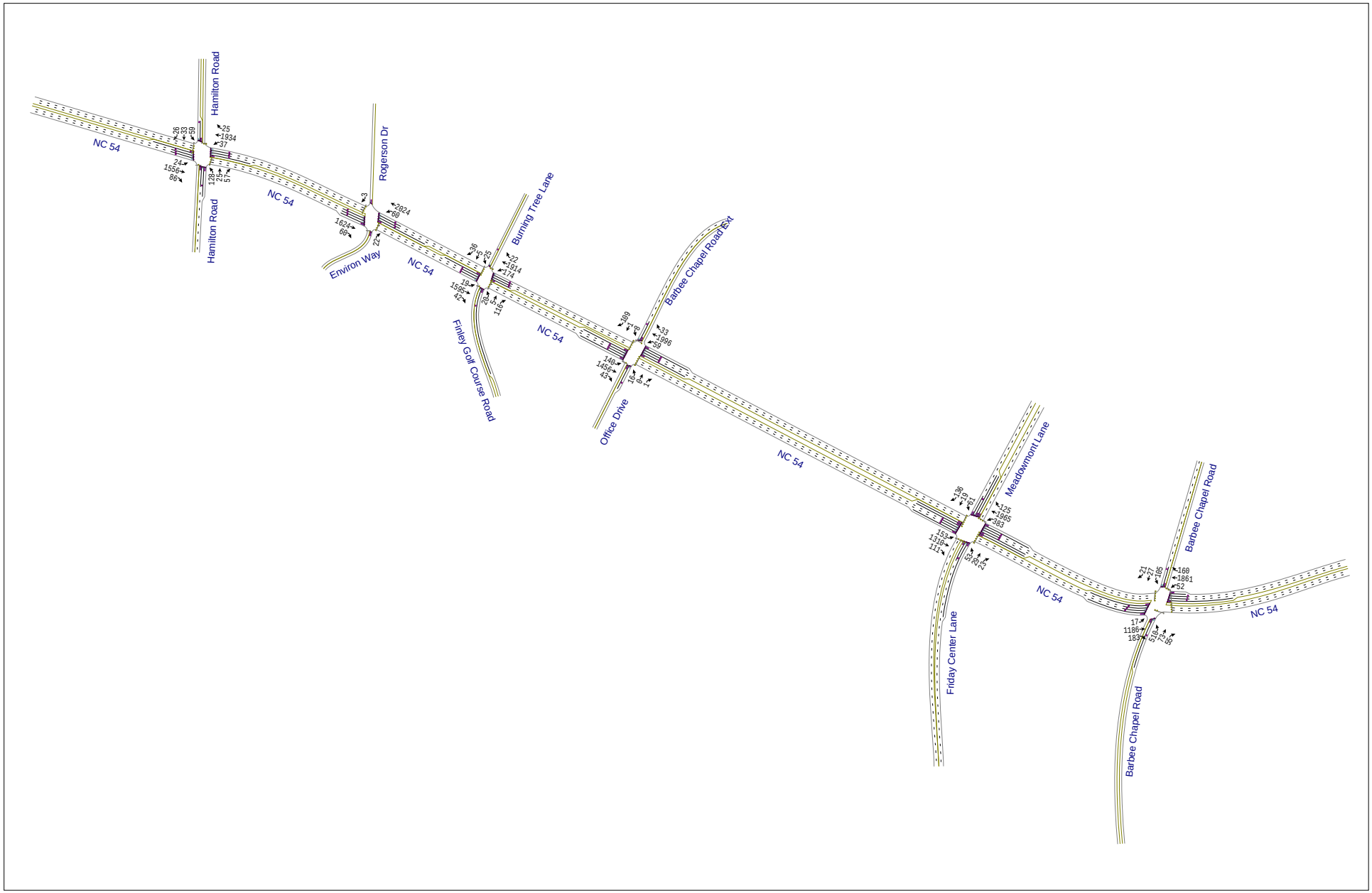


Figure 4-4d
Year 2023 A.M. Peak Hour Turning Movement Volumes

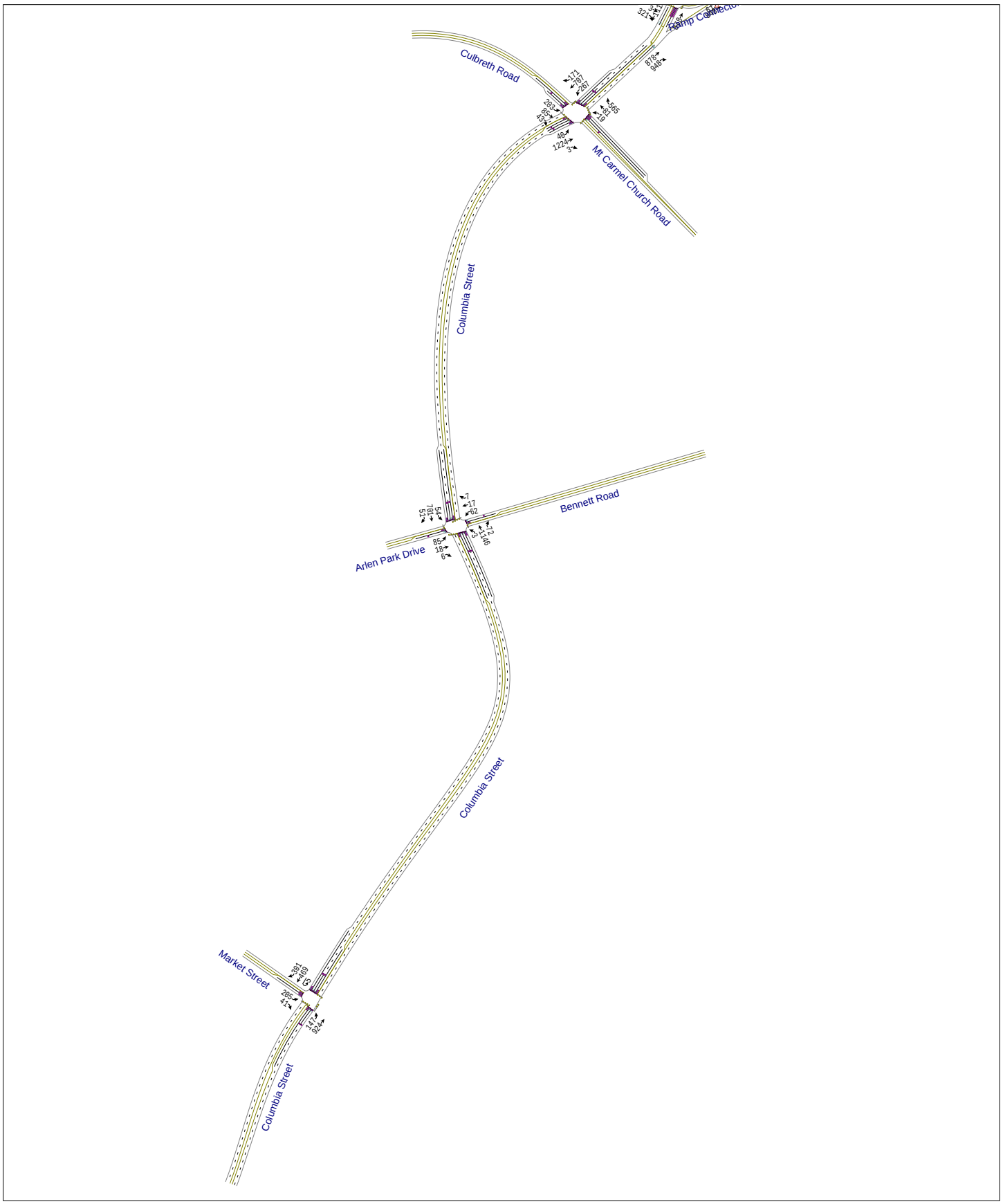


Figure 4-4e
Year 2023 A.M. Peak Hour Turning Movement Volumes

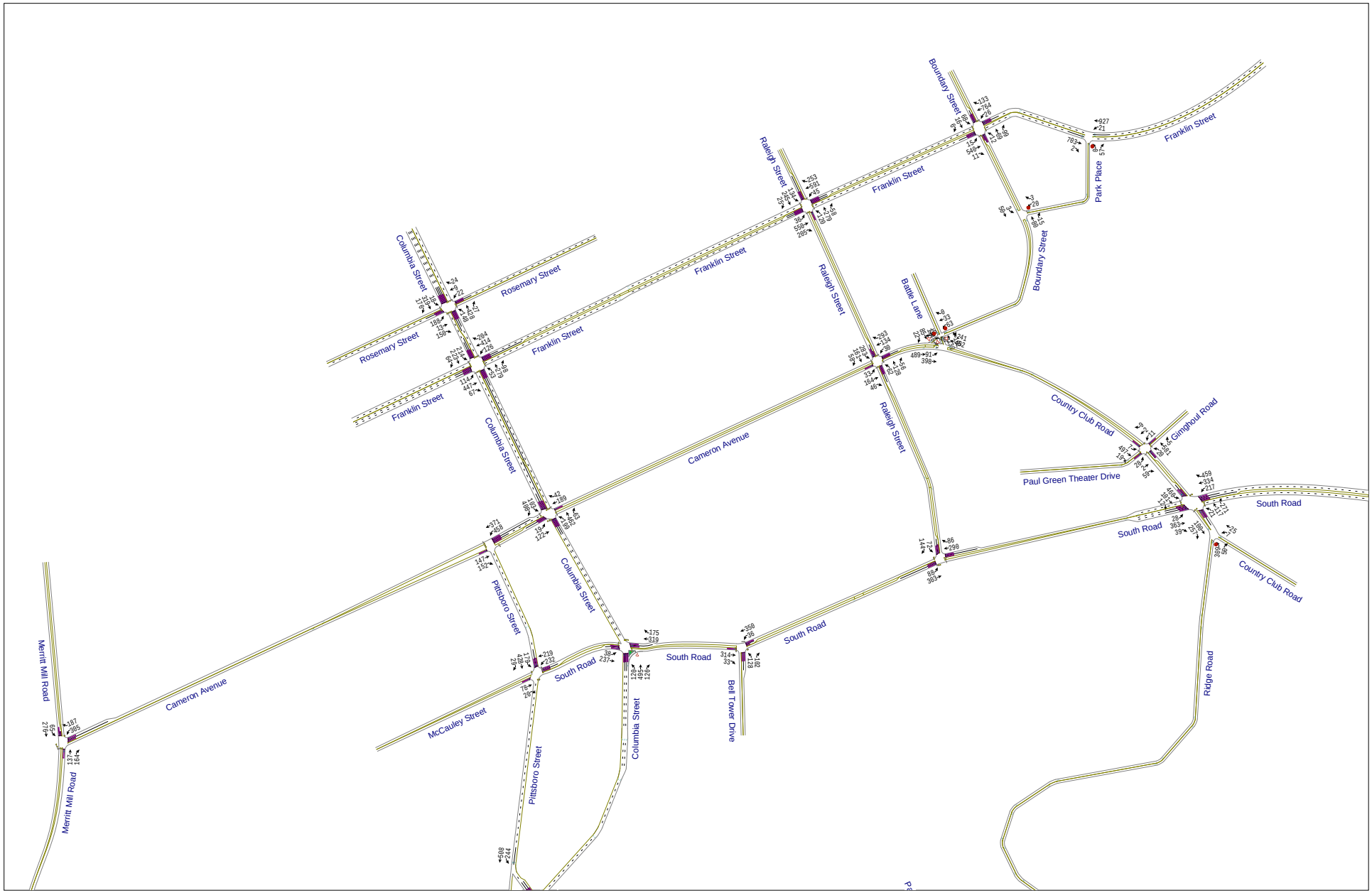


Figure 4-5a
Year 2023 P.M. Peak Hour Turning Movement Volumes

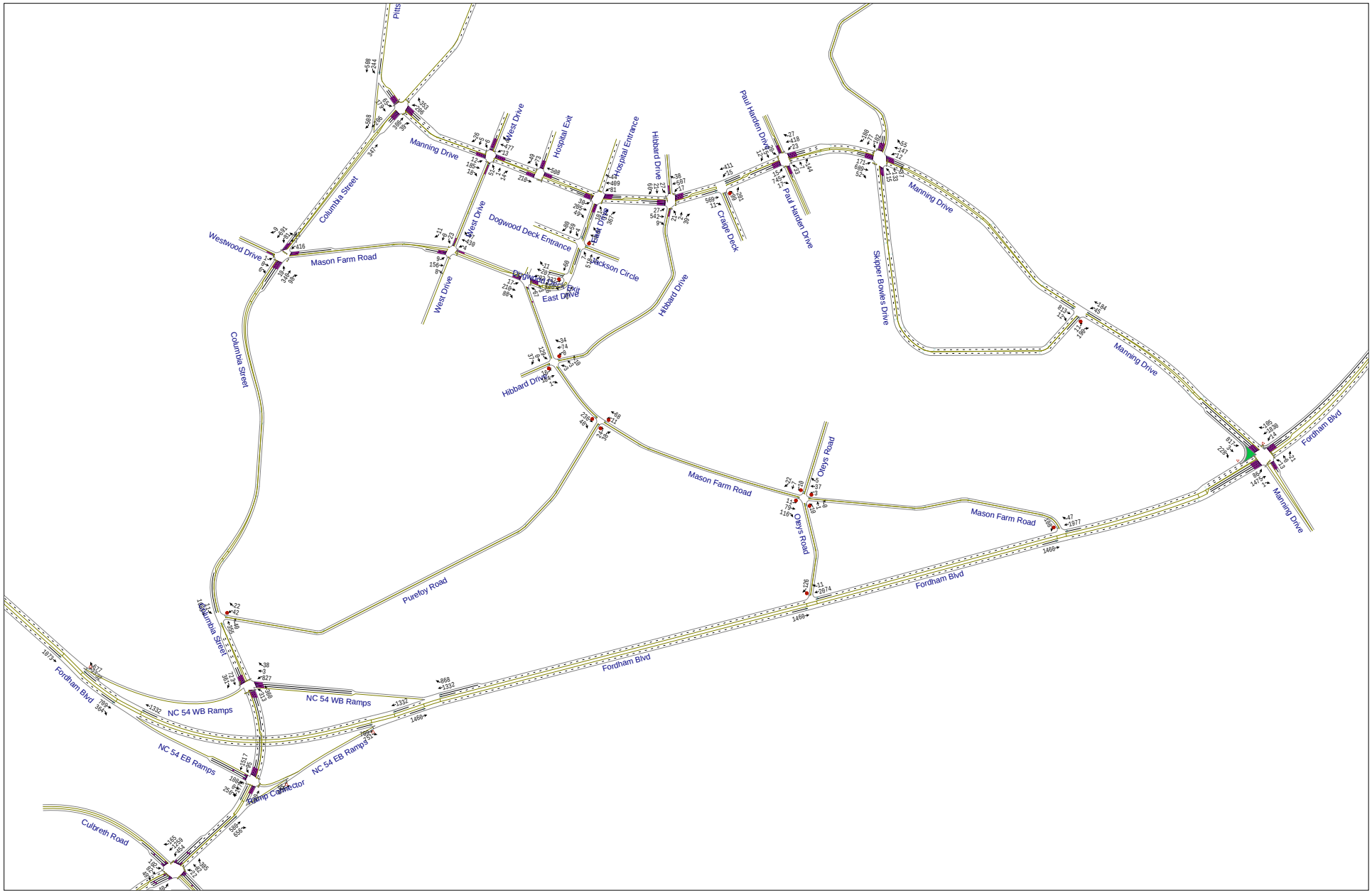


Figure 4-5b
Year 2023 P.M. Peak Hour Turning Movement Volumes

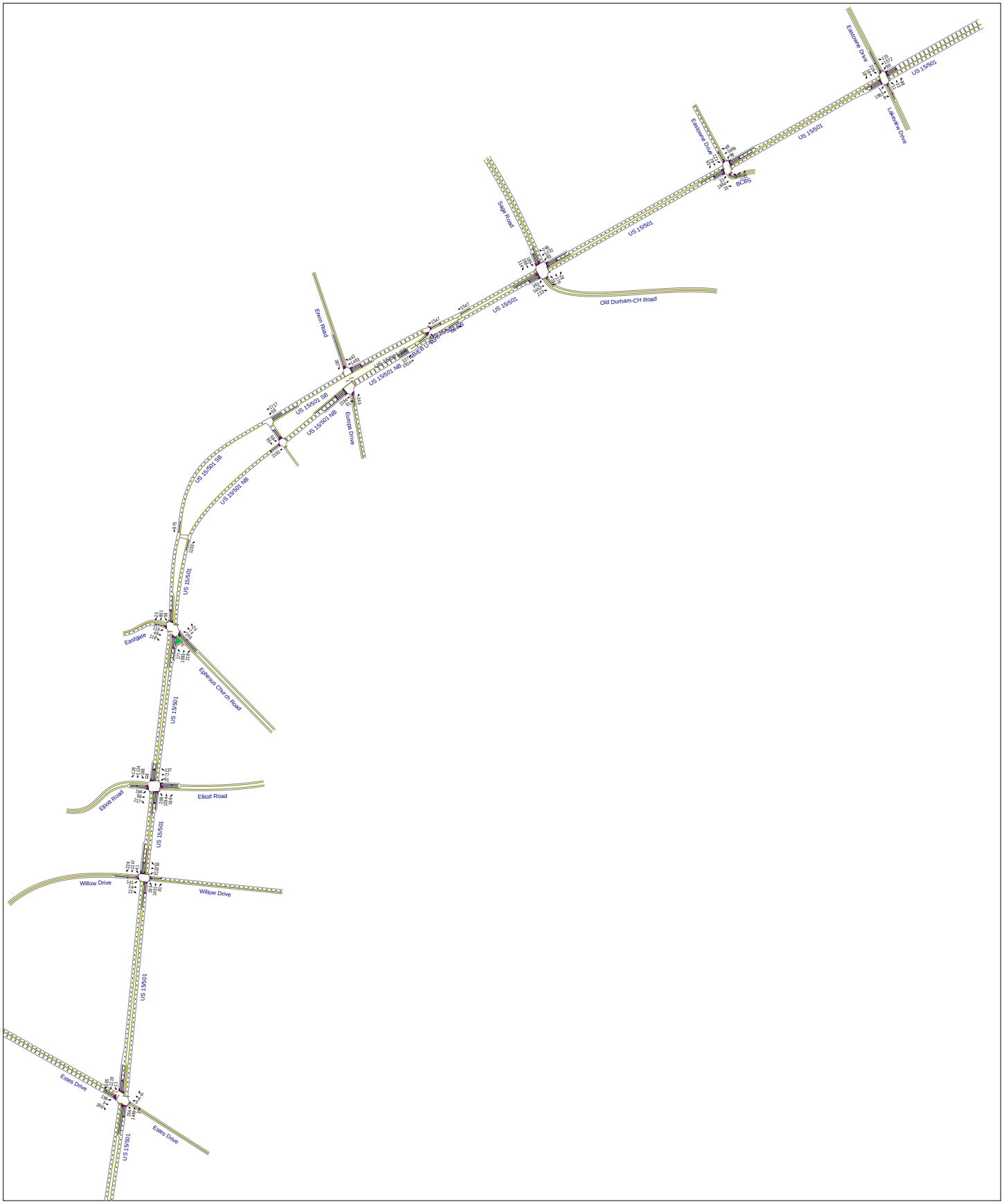


Figure 4-5c
Year 2023 P.M. Peak Hour Turning Movement Volumes

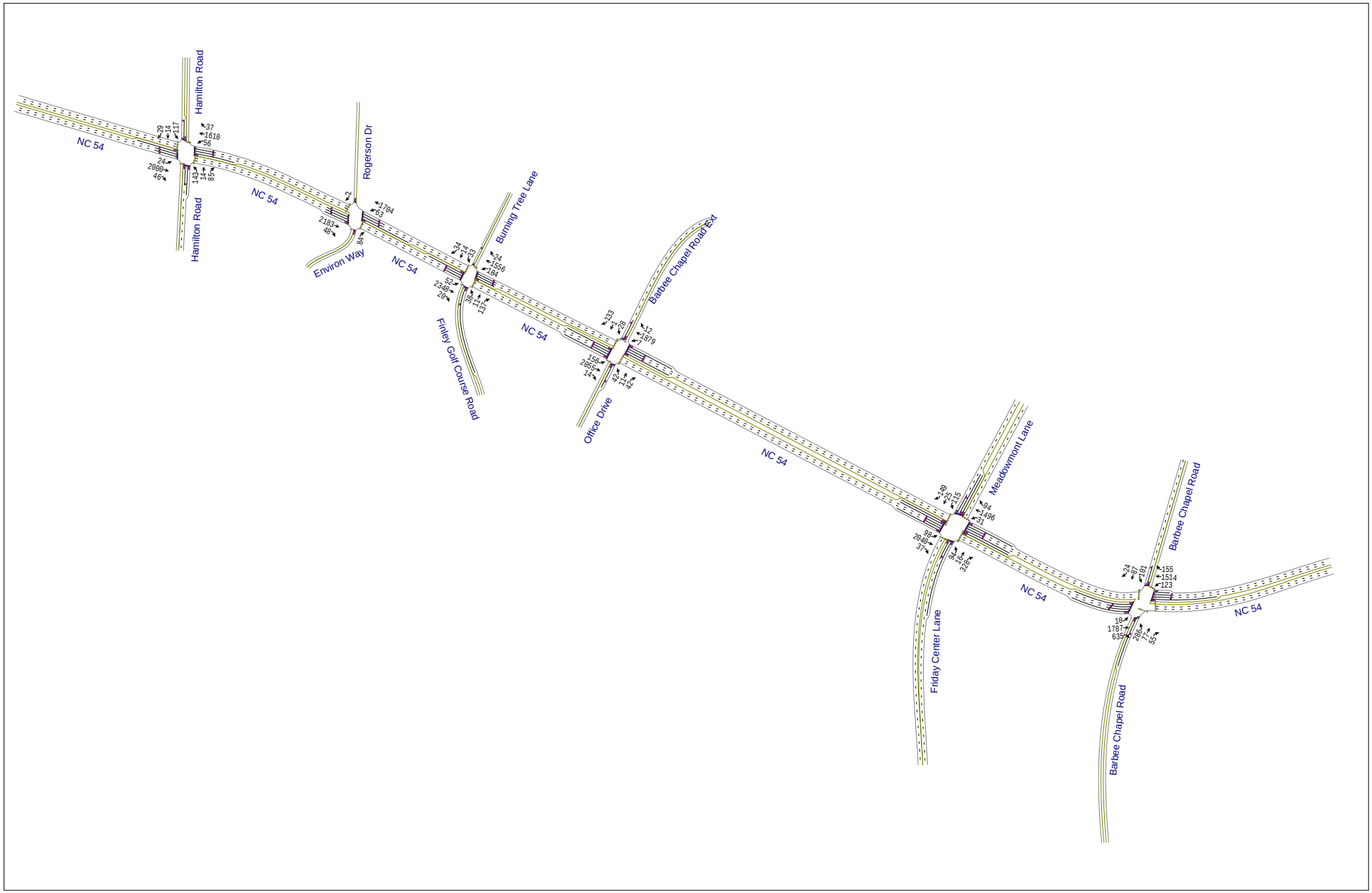


Figure 4-5d
Year 2023 P.M. Peak Hour Turning Movement Volumes

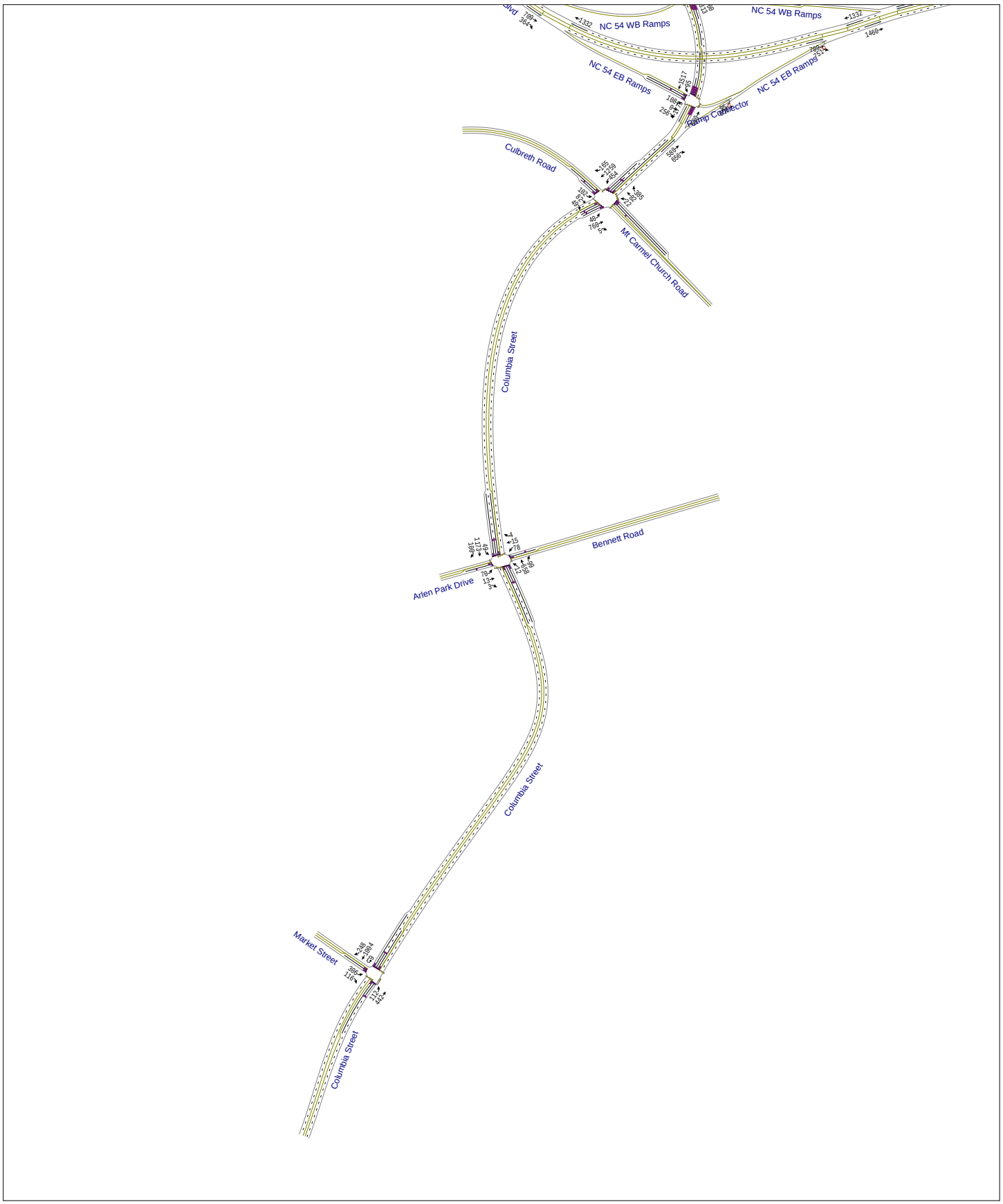


Figure 4-5e
Year 2023 P.M. Peak Hour Turning Movement Volumes

4.3.2 Level of Service Criteria

Peak hour level of service (LOS) measures the adequacy of the intersection geometrics and traffic controls of a particular intersection or approach for the given turning movement volumes. Levels of service range from A through F, based on the average control delay experienced by vehicles traveling through the intersection during the peak hour. Control delay represents the portion of total delay attributed to traffic control devices (e.g., signals or stop signs). The engineering profession generally accepts level of service D as an acceptable operating condition for signalized intersections in urban areas and level of service C for rural areas.

At unsignalized intersections, a level of service E is generally considered acceptable only if the side street encounters delay. Nevertheless, side streets sometimes function at level of service F during peak traffic periods, because the traffic volumes often do not warrant a traffic signal to assist side street traffic. Table 4-4 below provides a general description of the various LOS categories and delay ranges.

Table 4-4: Level of Service Descriptions for Intersections

Level of Service	Description	Signalized Intersection	Unsignalized Intersection
A	Little or no delay	<= 10 sec.	<= 10 sec.
B	Short traffic delay	10-20 sec.	10-15 sec.
C	Average traffic delay	20-35 sec.	15-25 sec.
D	Long traffic delay	35-55 sec.	25-35 sec.
E	Very long traffic delay	55-80 sec.	35-50 sec.
F	Unacceptable delay	> 80 sec.	> 50 sec.

4.3.3 Analysis Results

Capacity analysis for the existing roadway geometrics and traffic volumes were performed for both morning and afternoon peak hour periods using *Synchro Professional Version 11* and *Highway Capacity Software* (HCS+) software packages. A network outlining the study area was created in *Synchro* using existing geometric and timing/phasing data. Signalized intersections were grouped according to the Town of Chapel Hill's signal system zones, and timing splits were optimized within these zones using cycle length's based on signal timings provided by the Town. Lane widths, grades, pedestrian volumes, etc., were included in the analysis when available.

Table 4-5 summarizes the existing intersection levels of service. In Table 4-5, the overall intersection level of service and worst movement level of service are provided. The Appendix contains the output obtained from *Synchro*, which summarizes the peak period levels of service. Table 4-5 shows that the overall intersection level of service for the majority of Campus study area intersections is LOS D or better, while some minor street approaches are suffering longer delays (worse than LOS D). Delays and queues are typically experienced on the southbound approach of Manning Drive at the intersection with Fordham Boulevard during the AM and PM peak hours of traffic. The overall level of service during the PM peak hour is indicated at LOS E and the southbound approach is operating at LOS E with queues that typically extend north toward Skipper Bowles Drive.

As indicated in Table 4-5, a number of intersections operate at LOS D or better for the overall intersection operations, but report LOS E or F on some approaches at the same intersection. Many of the intersections along NC 54 and US 15-501 are examples. In these instances, the major street approaches are given priority over the minor side street approaches in order to coordinate the traffic flow along the major corridor.

As stated in the past updates of the Development Plan Impact Analysis reports, the US 15-501 Major Investment Study concluded that while some minor improvements could be made at intersections along this corridor, the magnitude of the delays being experienced requires a large-scale integrated, multimodal solution. It is anticipated that this corridor will undergo significant highway and transit improvements in the future. These improvements will help relieve congestion along this heavily traveled roadway. The section of US 15-501 at the intersection with Europa Drive and Erwin Road has been converted to a superstreet facility. All of the intersections in the superstreet section of US 15-501 are operating at LOS C or better in both the AM peak hour and the PM peak hour.

Some unsignalized intersections are experiencing long delays on their stop-controlled approaches. These intersections include Purefoy Road at Columbia Street, Mason Farm Road at Fordham Boulevard, and Battle Lane at Country Club Road. All are registering long delays on the side street approaches but still maintaining acceptable overall levels of service; however as previously required by the Town of Chapel Hill, traffic signal warrants analyses were performed for the unsignalized intersections of Skipper Bowles Drive at Manning Drive, Mason Farm Road at Purefoy Road, and Mason Farm Road at Oteys Road. Those analyses are described in further detail in section 4.8.

Table 4-5: Existing (2023) Intersection Levels of Service

ID #	Intersection	Control	Existing (2023)	
			AM	PM
1	Columbia Street/Rosemary Street	Signalized	B (WB-C)	B (EB-C)
2	Columbia Street/Franklin Street	Signalized	C (SB-D)	D (SB-E)
3	Franklin Street/Raleigh Street	Signalized	C (NB-D)	C (NB-C)
4	Merritt Mill Road/Cameron Avenue	Signalized	B (WB-B)	B (NB-C)
5	Cameron Avenue/Pittsboro Street	Signalized	B (EB-B)	B (EB-B)
6	Cameron Avenue/Columbia Street	Signalized	D (WB-E)	E (WB-F)
7	Cameron Avenue/Raleigh Street	Signalized	C (NB-C)	C (NB-D)
8	Pittsboro Street/McCauley Street	Signalized	B (WB-B)	B (WB-B)
9	Columbia Street/South Road	Signalized	B (EB-C)	B (WB-C)
10	Raleigh Street/South Road	Signalized	A (WB-B)	A (WB-B)
11	Country Club Road/South Road	Signalized	C (SB-C)	C (SB-D)
12	Columbia Street/Manning Drive	Signalized	C (EB-D)	C (EB-E)
13	Manning Drive/West Drive	Signalized	A (NB-D)	A (NB-C)
14	Manning Drive/East Drive	Signalized	B (NB-C)	B (NB-C)
15	Ridge Road/Manning Drive	Signalized	C (NB-D)	C (NB-D)
16	Mason Farm Road/Columbia Street	Signalized	B (WB-D)	C (WB-C)
17	Mason Farm Road/West Drive	Signalized	A (SB-B)	A (SB-A)
18	Mason Farm Road/East Drive	Signalized	B (NB-B)	B (NB-B)
19	Mason Farm Road/Purefoy Road	Unsignalized	A (EB-A)	A (SB-A)
20	Manning Drive/Skipper Bowles Drive	Unsignalized	A (NB-B)	A (NB-C)
21	Columbia Street/Purefoy Road	Unsignalized	A (WB-E)	A (WB-F)
22	Columbia Street/Fordham Boulevard (northern ramp)	Signalized	C (WB-E)	D (WB-E)
23	Columbia Street/Fordham Boulevard (southern ramp)	Signalized	B (EB-E)	B (EB-E)
24	Mason Farm Road/Fordham Boulevard	Unsignalized	A (SB-C)	A (SB-E)
25	Manning Drive/Fordham Boulevard	Signalized	C (SB-E)	E (SB-F)
26	Mason Farm Road/Oteys Road	Unsignalized	A (NB-A)	A (EB-A)
27	Franklin Street/Boundary Street	Signalized	A (SB-B)	A (SB-B)
28	Franklin Street/Park Place	Unsignalized	A (NB-A)	A (NB-B)
29	Battle Lane/Boundary Street	Unsignalized	A (WB-A)	A (NB-A)
30	Country Club Road/Battle Lane	Unsignalized	A (SB-D)	C (SB-F)
307	Country Club Road & Boundary Street	Unsignalized	A (SB-B)	C (SB-F)
31	Country Club Road/Gimghoul Road	Signalized	A (WB-B)	A (WB-B)
32	Manning Drive/Hibbard Drive	Signalized	A (SB-D)	A (SB-D)
33	Manning Drive/Craige Drive	Signalized	A (SB-D)	B (SB-E)
34	East Drive/Jackson Circle/Dogwood Deck Entrance	Unsignalized	A (WB-B)	A (WB-B)
35	East Drive/Dogwood Deck Exit	Unsignalized	A (EB-B)	A (EB-B)
36	Mason Farm Road/Hibbard Drive	Unsignalized	B (WB-B)	B (EB-C)
37	South Road/Bell Tower Drive	Signalized	B (NB-B)	B (NB-C)
38	Manning Drive/Old East Drive	Signalized	A (SB-D)	A (SB-C)
39	Manning Drive/Craige Deck	Unsignalized	A (NB-C)	A (NB-C)
101	US 15-501/Estes Drive	Signalized	B (WB-E)	C (EB-F)
102	US 15-501/Willow Drive	Signalized	B (WB-E)	C (WB-E)
103	US 15-501/Elliottt Road	Signalized	B (EB-E)	D (EB-E)
104	US 15-501/Ephesus Church Road	Signalized	C (WB-F)	D (EB-F)
105	US 15-501/Erwin Road	Signalized	C (SB-F)	B (SB-F)
106	US 15-501/Europa Drive	Signalized	A (NB-E)	B (NB-F)
107	US 15-501/Superstreet NB U-Turn	Signalized	B (NB-E)	C (NB-E)
108	US 15-501/Superstreet SB U-Turn	Signalized	A (SB-E)	B (SB-F)
109	US 15-501/Sage Road	Signalized	D (NB-F)	E (NB-F)
110	US 15-501/Eastowne Drive/BCBS	Signalized	B (NB-E)	B (SB-E)
111	US 15-501/Eastowne Drive/Lakeview Drive	Signalized	B (SB-F)	C (SB-F)
201	NC 54/Hamilton Street	Signalized	B (NB-E)	B (NB-E)
202	NC 54/Burning Tree Lane	Signalized	A (SB-D)	B (SB-E)
203	NC 54/Barbee Chapel Road Ext	Signalized	B (NB-F)	B (NB-F)
204	NC 54/Meadowmont Lane	Signalized	C (NB-D)	C (NB-E)
205	NC 54/Barbee Chapel Road (East)	Signalized	D (NB-E)	C (SB-F)
301	US 15-501/Culbreth Road/Mt Carmel Church Road	Signalized	E (EB-F)	E (WB-F)
302	US 15-501/Bennett Road/Arlen Park Drive	Signalized	B (EB-E)	B (WB-F)
303	US 15-501/Market Street	Signalized	B (EB-C)	C (EB-C)

Legend: X = Overall intersection level of service; (X) = worst movement level of service.

4.4 TRIP GENERATION

To determine the impact of the future development on Campus, parking was determined to be the best indicator of additional trips on the study area network. By 2024, the overall additional parking on campus will increase by approximately 1,579 spaces in comparison to the number of spaces present in 2001. In some areas of campus, parking will decrease, while in other areas parking will increase. The objective of the future analysis is to determine the impact of these changes on surrounding intersections. To accomplish this, the parking was converted into peak hour vehicle trips and then distributed to the study area network, as described below.

4.4.1 Parking Generation Rates

Parking generation rates (the number of vehicular trips generated per parking space) were applied to the parking sites which lost or gained spaces. These rates were developed for five types of users: employees, commuter students, resident students, hospital visitor/patients, and University visitors. The rates are shown in Table 4-6 and were developed using traffic counts undertaken at the entry and exit points of selected parking facilities during the fall of 2001, data from card readers at entrances to gated facilities, and visitor counts from various University and UNC Health Care parking areas.

Table 4-6: Trip Generation Rates (Vehicle Trips per Space)

User Type	Trip Rates (Trips per Space)				
	Weekday	AM In	AM Out	PM In	PM Out
Hospital Visitor	8.2	0.62	0.19	0.17	0.44
University Visitor	7.6	0.41	0.13	0.71	0.59
Employee	3.6	0.36	0.07	0.13	0.30
Resident Student	7.2	0.22	0.17	0.25	0.28
Commuter Student	3.6	0.33	0.05	0.27	0.34

4.4.2 Campus Parking Areas and Distribution

In total there are nearly 30 parking lots on Campus that will be affected by the Development Plan. These parking lots were divided into 24 geographical areas in the analysis. Within each area, the resulting net change in trips was distributed over the study area network, based on an overall regional distribution of traffic and an understanding of how traffic uses the intra-campus road network. The regional distribution of traffic was determined from employee and hospital patient home address data. Intra-campus traffic distribution was based on the existing AM and PM traffic counts (see Figure 4-4 and Figure 4-5).

Table 4-7 summarizes the trip generation by campus parking area. The parking areas and overall directional distribution of traffic per area are shown in Figure 4-6.

Table 4-7: Trip Generation by Campus Parking Area

Campus Parking Areas*	Lot Name	Parking Zone	Parking Designation	Change in Parking Totals (spaces)	Change in AM In (trips)	Change in AM Out (trips)	Change in PM In (trips)	Change in PM Out (trips)	Change in Daily Trips (ADT)
1	Porthole	N2	Employee	-40	-15	-3	-5	-12	-144
			Area 1 Totals	-40	-15	-3	-5	-12	-144
2	Cameron Deck	ND1	Visitor	330	136	44	236	195	2500
2	Swain	NG1	Net Change	-214	-81	-19	-63	-82	-1009
			Area 2 Totals	116	55	25	173	113	1491
3	Hanes		Visitor	-32	-13	-4	-23	-19	-242
			Area 3 Totals	-32	-13	-4	-23	-19	-242
4	Sitterson	NG2	Employee	-135	-49	-9	-18	-41	-486
4	Venable Deck	ND2	Employee	0	0	0	0	0	0
4	Wilson Library	N8	Employee	-41	-15	-3	-5	-12	-148
			Area 4 Totals	-176	-64	-12	-23	-53	-634
5	McCauley Street	W	Employee/Student	-20	-26	12	13	-9	409
			Area 5 Totals	-20	-26	12	13	-9	409
6	Conner/Cobb/Joyner	N4	Employee	126	46	18	25	44	454
6	Conner/Cobb/Joyner	N4	Visitor	-6	0	0	0	0	0
6	Conner/Cobb/Joyner	N4	Student	-33	-11	-2	-9	-11	-119
6	Conner/Cobb/Joyner	N4	Service	-8	3	1	1	2	29
			Area 6 Totals	79	38	17	17	35	364
7	North Medical Drive		Service	-26	-9	-2	-3	-8	-94
			Area 7 Totals	-26	-9	-2	-3	-8	-94
8	Rams Head	S5	Net Change	303	125	40	217	179	2296
8	Ridge Road	S1	Net Change	-16	-5	-2	-3	-5	-79
			Area 8 Totals	287	120	38	214	174	2217
9	Glaxo/HousingSupport/MFM/MRI	S6	Employee	-46	-17	-3	-6	-14	-166
			Area 9 Totals	-46	-17	-3	-6	-14	-166
10	ACC		Visitor	198	122	37	33	87	1621
			Area 10 Totals	198	122	37	33	87	1621
11	Dental School	S6	Employee	-53	-19	-4	-7	-16	-191
			Area 11 Totals	-53	-19	-4	-7	-16	-191
12	Gravely	CG	Net Change	595	401	127	105	280	5491
			Area 12 Totals	595	401	127	105	280	5491
13	Neurosciences	CG	Employee	-108	-39	-7	-14	-33	-389
			Area 13 Totals	-108	-39	-7	-14	-33	-389
14	Student Family Housing	MR/MR2	Student	79	18	14	19	22	568
			Area 14 Totals	79	18	14	19	22	568
15	Craige Surface/Deck	CD	Net Change	741	274	47	93	224	2536
			Area 15 Totals	741	274	47	93	224	2536
16	Bowles	S11	Net Change	-628	-223	-40	-104	-195	-2262
16	Kenan/McColl Visitor Parking		Visitor	-40	-16	-5	-29	-24	-303
			Area 16 Totals	-668	-240	-46	-132	-219	-2565
17	Hinton James	M	Student	-250	-56	-43	-61	-70	-1797
			Area 17 Totals	-250	-56	-43	-61	-70	-1797
18	Jackson Circle		Employee	606	220	42	80	183	2182
18	Jackson Circle		Student	100	33	5	27	34	360
18	Jackson Circle		Visitor	-54	-12	-9	-13	-15	-442
			Area 18 Totals	652	241	37	93	201	2100
19	Bell Tower North Access	BG	Employee	124	45	9	16	37	447
			Area 19 Totals	124	45	9	16	37	447
20	ITS	S2	Service	24	9	2	3	7	86
20	ITS	S2	Visitor	-2	0	0	0	0	0
20	ITS	S2	Employee	-29	-11	-2	-4	-9	-104
			Area 20 Totals	-7	-2	0	-1	-2	-18
21	Unassigned Spaces	S11	Employee	32	12	2	4	10	115
			Area 21 Totals	32	12	2	4	10	115
22	South Chiller	S6	Employee	-129	-47	-9	-17	-39	-465
			Area 22 Totals	-129	-47	-9	-17	-39	-465
23	Tennis Deck	P12	Employee	231	84	16	30	70	832
			Area 23 Totals	231	84	16	30	70	832
				Parking Totals (spaces)	AM In (trips)	AM Out (trips)	PM In (trips)	PM Out (trips)	Daily Trips (ADT)
			Campus-Wide Totals	1,579	883	248	518	781	11,487

*See Figure 4-6 for Campus Parking Areas Locations

Figure 4-6: Campus Parking Areas and Directional Distribution

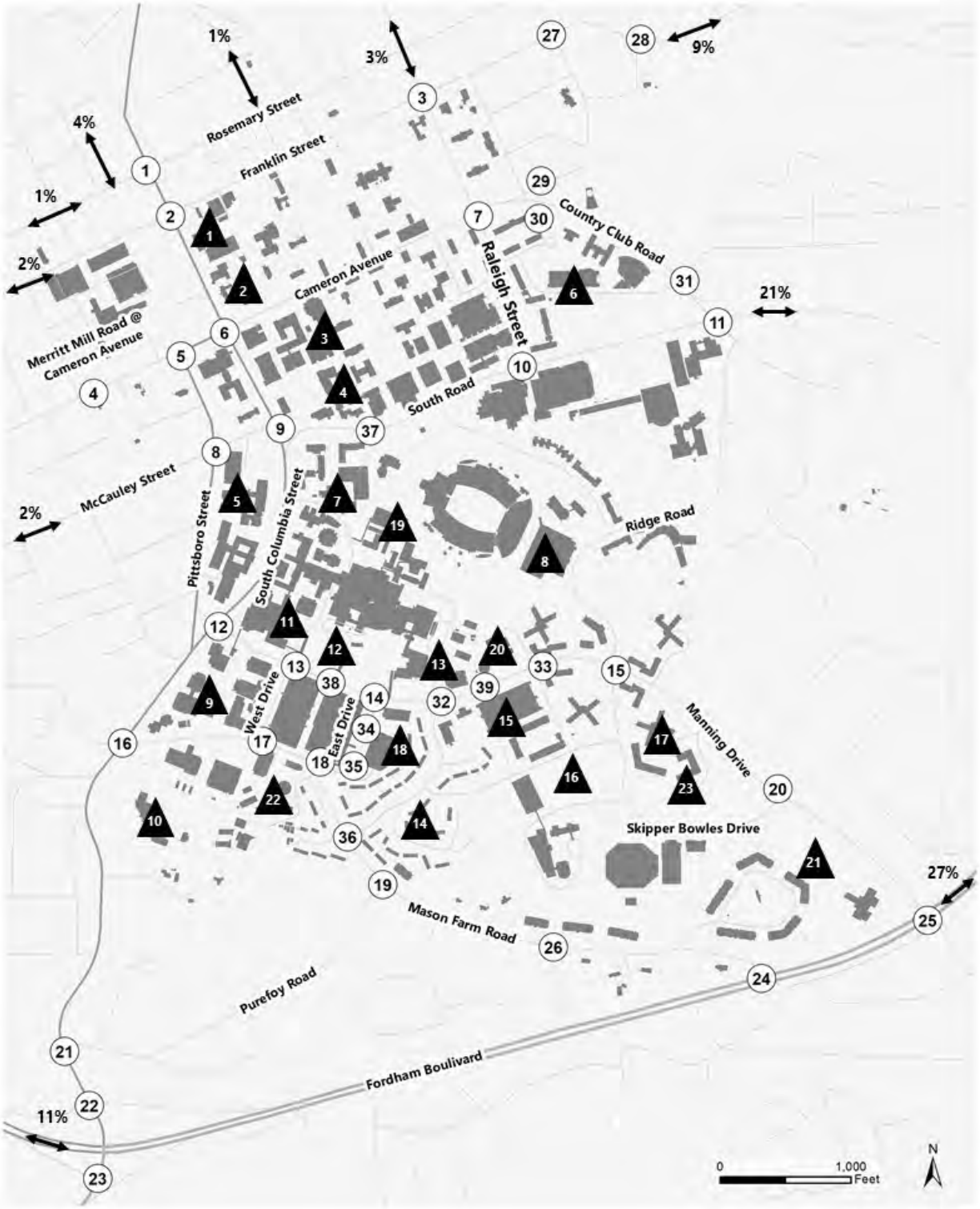


Figure 4-6: Campus Parking Areas and Directional Distribution (Continued)

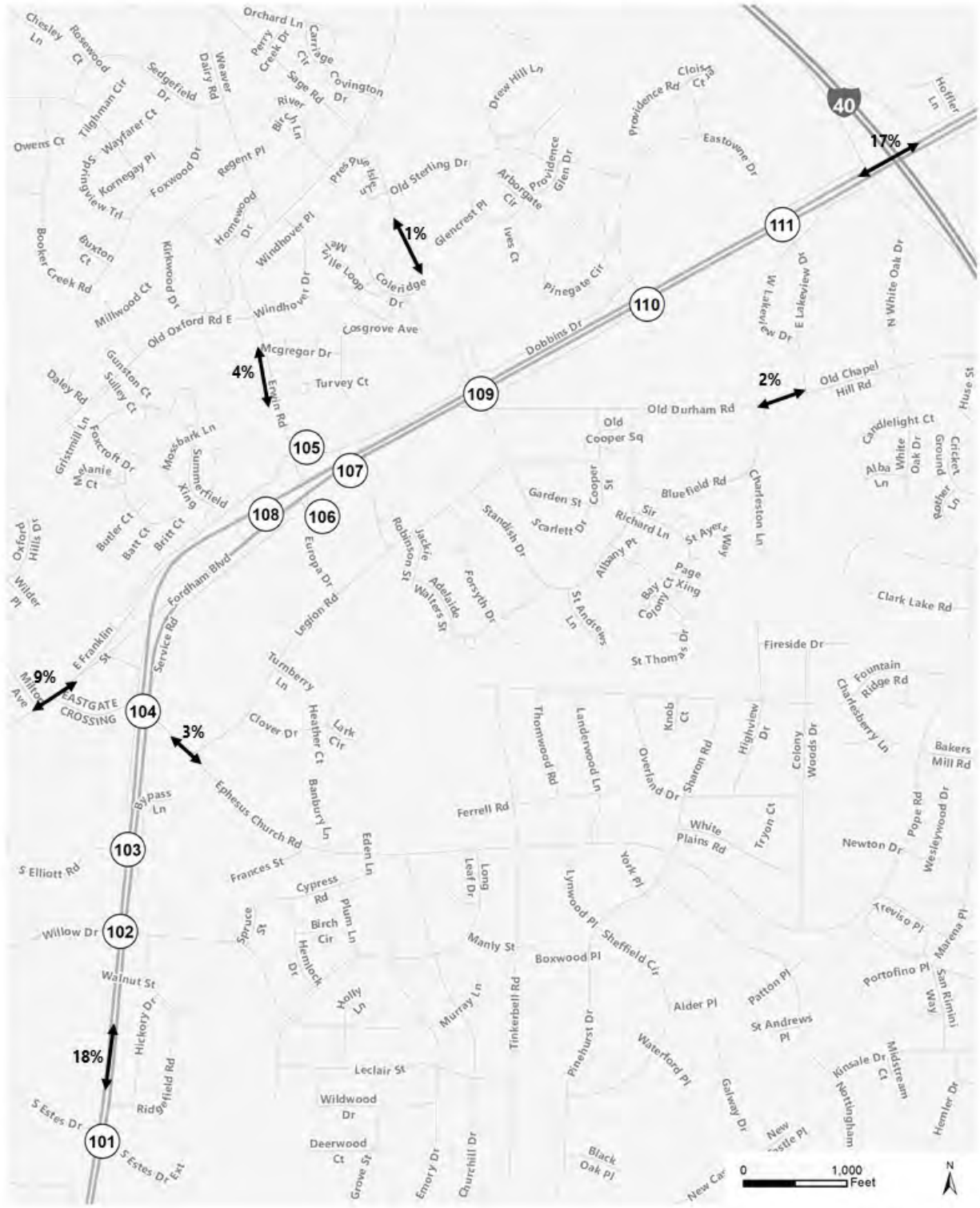


Figure 4-6: Campus Parking Areas and Directional Distribution (Continued)

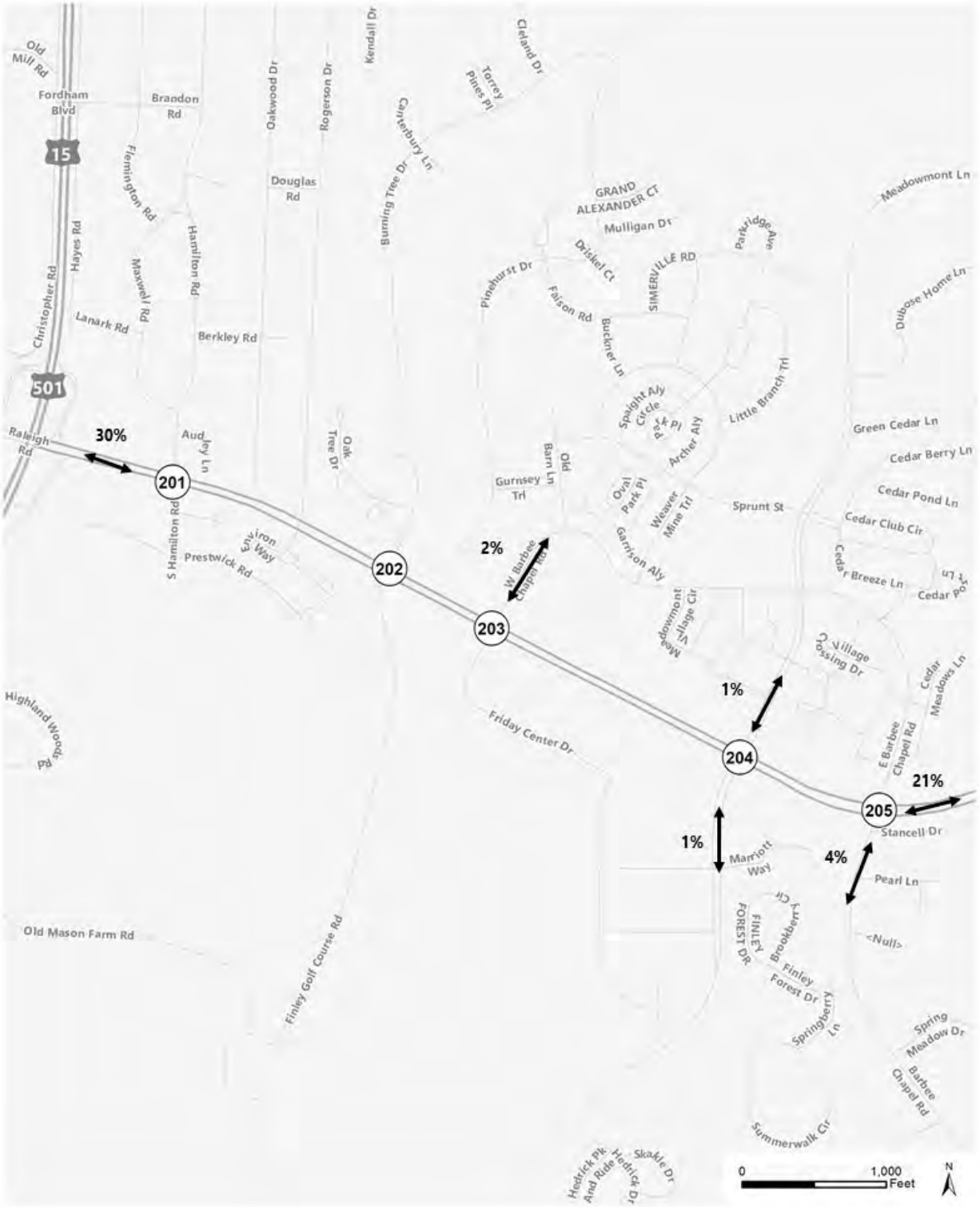
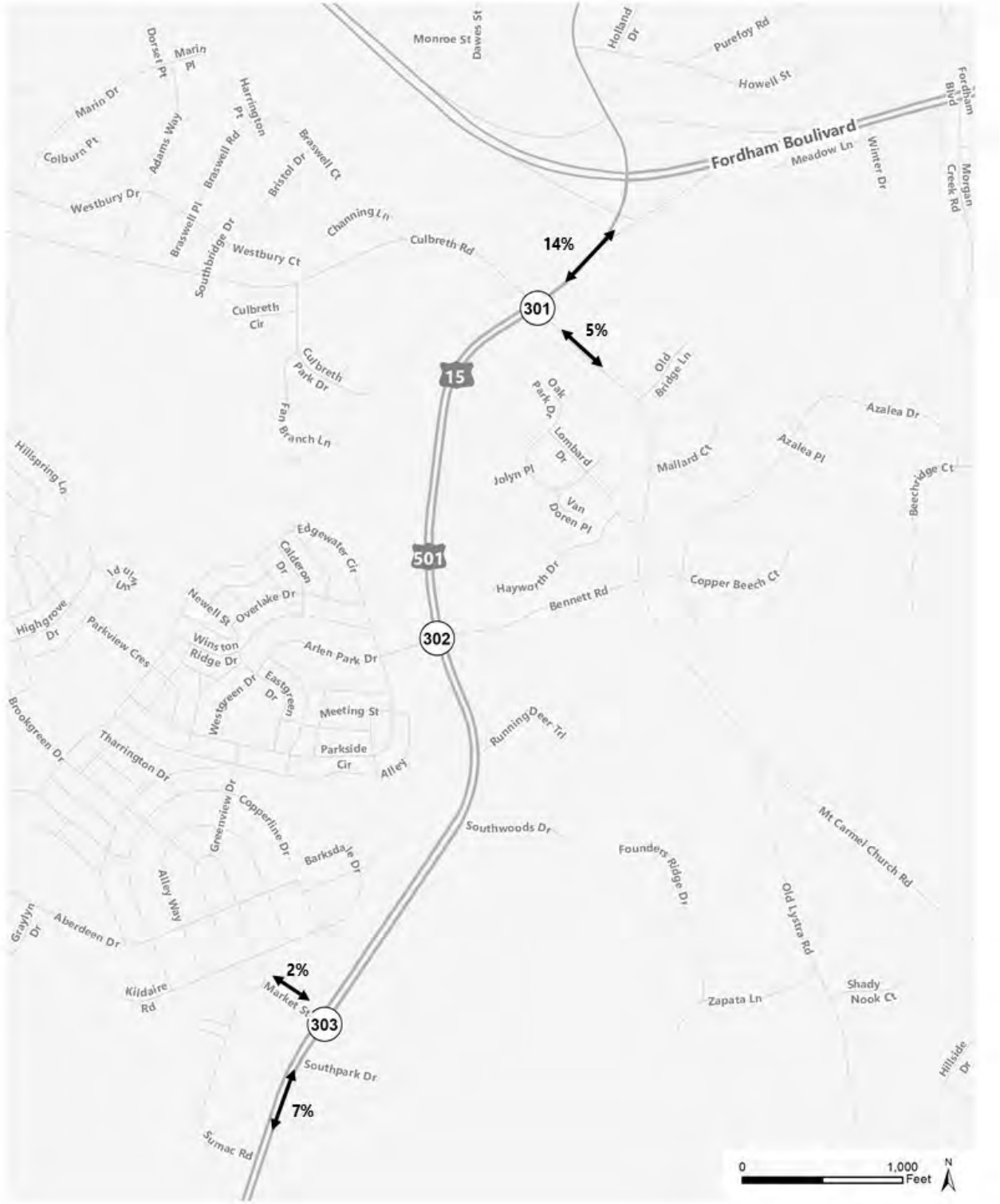


Figure 4-6: Campus Parking Areas and Directional Distribution (Continued)



4.5 TRAFFIC PROJECTIONS

Through the year 2013 Development Plan TIA Update, the traffic projections for No-Build and Build conditions were estimated for the year 2015; however, the build year was changed to 2022 for the 2015 update. The No-Build and Build analyses for the 2023 update have been completed for the year 2030, maintaining a seven-year horizon. The change is intended to capture the anticipated completion of the main campus development plan.

The future build year traffic analysis is presented for the following cases:

- Year 2030 No-Build scenario traffic projections, consisting of projected background traffic growth.

- Year 2030 Build scenario traffic projections, including background traffic growth and Development Plan traffic as described in Section 4.4.

4.5.1 No-Build Scenario

No-Build traffic was developed for 2030. No-Build year 2030 intersection Average Daily Traffic (ADT) and turning movement volumes were determined as described below.

No-Build Average Daily Traffic

Based on historical count data from NCDOT, projected annual growth rates determined from the regional travel demand model, and information from the Town, annual growth rates were applied to existing traffic to yield the future background traffic for year 2030. The annual growth rates and projected future ADTs for study area roads are listed in Table 4-9 and are displayed in Figure 4-9.

No-Build Turning Movement Volumes

Utilizing the annual growth rates from Table 4-9, the intersection turning movement counts listed in Table 4-8 and shown in Figure 4-4 and Figure 4-5 were adjusted to reflect future year 2030 conditions. Growth rates were applied to each approach of the intersections, ranging from no growth to three percent annually. These volumes were then used in the 2030 No-Build analysis.

West Drive Two-Way Conversion

Since completion of the 2019 Update, West Drive has been converted to a two-way street instead of its original southbound only configuration. This configuration was captured with new traffic data collection in the Fall of 2023.

Table 4-8: Future No-Build Year 2024 Turning Movement Volumes

AM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
1	Columbia Street/Rosemary Street	96	1	76	18	5	6	83	333	33	0	25	461	107
2	Columbia Street/Franklin Street	54	275	36	75	336	116	33	283	85	0	100	423	53
3	Franklin Street/Raleigh Street	14	304	108	61	413	138	127	185	37	0	46	301	26
4	Merritt Mill Road/Cameron Avenue	0	0	0	53	0	36	0	149	345	0	139	87	0
5	Cameron Avenue/Pittsboro Street	0	144	149	507	185	0	0	0	0	0	0	0	0
6	Cameron Avenue/Columbia Street	20	88	0	0	125	37	107	362	30	0	77	0	503
7	Cameron Avenue/Raleigh Street	18	61	30	32	165	275	33	42	12	0	276	155	50
8	Pittsboro Street/McCauley Street	0	112	25	176	56	0	0	0	0	0	94	501	9
9	Columbia Street/South Road	22	250	0	0	260	105	63	378	226	0	0	0	0
10	Raleigh Street/South Road	58	220	0	0	349	25	0	0	0	0	47	0	119
11	Country Club Road/South Road	5	180	33	469	400	497	20	42	40	0	282	168	12
12	Columbia Street/Manning Drive	81	346	0	59	0	151	0	444	192	0	0	0	0
13	Manning Drive/West Drive	27	373	110	97	186	13	14	12	7	0	8	9	16
14	Manning Drive/East Drive	68	287	142	216	209	55	49	22	201	0	0	0	0
15	Ridge Road/Manning Drive	81	229	57	8	490	69	9	40	5	0	33	147	304
16	Mason Farm Road/Columbia Street	2	1	6	115	2	64	8	605	472	0	133	232	3
17	Mason Farm Road/West Drive	148	325	11	5	137	39	0	0	0	0	31	6	20
18	Mason Farm Rod/East Drive	99	227	63	10	82	25	70	30	60	0	0	0	0
19	Mason Farm Road and Purefoy Road	141	0	34	0	0	0	11	182	0	0	0	49	10
20	Manning Drive/Skipper Bowles Drive	0	309	18	285	619	0	1	0	22	0	0	0	0
21	Columbia Street/Purefoy Road	0	0	0	32	0	5	0	1050	150	0	3	372	0
22	Columbia Street/Fordham Boulevard WB Ramps	0	0	0	567	3	68	179	1148	0	0	0	282	91
23	Columbia Street/Fordham Boulevard EB Ramps	346	3	344	0	0	0	0	909	0	0	63	826	0
24	Mason Farm Road/Fordham Boulevard	0	2543	0	0	1384	95	0	0	0	0	0	0	26
25	Manning Drive/Fordham Boulevard	198	2256	4	10	1400	779	18	5	38	0	182	2	45
26	Mason Farm Road/Oteys Road	48	21	11	2	100	19	36	1	1	0	3	3	22
27	Franklin Street/Boundary	11	300	13	57	623	74	3	19	18	0	43	20	8
28	Franklin Street/Park Place	0	357	2	35	751	0	0	0	10	0	0	0	0
29	Battle Lane/Boundary Street	0	0	0	52	42	0	0	67	37	0	0	57	14
30	Country Club Road/Battle Lane	44	320	0	0	386	107	0	0	0	0	109	0	0
307	Country Club Road/Boundary Street	0	365	0	0	386	0	0	0	0	0	0	0	57
31	Country Club Road/Gimghoul Road	2	0	10	6	1	6	59	554	4	0	8	411	25
32	Manning Drive/Hibbard Drive	50	460	17	13	421	34	4	17	12	0	36	10	46
33	Manning Drive/Craige Drive	7	383	19	159	648	29	8	10	26	0	24	1	9
34	East Drive/Jackson Circle/Dogwood Deck Entrance	0	0	0	1	0	1	18	292	4	0	58	101	214
35	East Drive/Dogwood Deck Exit	172	0	96	0	0	0	0	157	0	0	0	62	0
36	Mason Farm Road/Hibbard Drive	37	36	12	10	148	104	3	4	2	0	23	4	25
37	South Road/Bell Tower Drive	0	310	143	147	317	0	50	0	95	0	0	0	0
38	Manning Drive/New East Drive	0	407	0	0	255	0	0	0	0	0	92	0	33
39	Manning Drive/Craige Deck	0	360	135	183	445	0	10	0	21	0	0	0	0
101	US 15-501/Estes Drive	119	3	219	10	2	5	262	1262	5	0	2	1258	85
102	US 15-501/Willow Drive	65	14	24	54	39	38	155	1254	36	0	28	1369	263
103	US 15-501/Elliot Road	29	35	151	95	55	146	106	1175	58	5	73	1291	30
104	US 15-501/Ephesus Church Road	51	24	85	172	50	13	100	1025	132	0	35	1060	11
105	US 15-501/Erwin Road	0	0	0	0	1749	294	0	0	0	0	0	0	485
106	US 15-501/Europa Drive	0	1932	104	0	0	0	0	0	153	0	0	0	0
107	US 15-501/Superstreet NB U-Turn	0	0	0	0	1783	0	314	0	0	0	0	0	0
108	US 15-501/Superstreet SB U-Turn	0	1972	0	0	0	0	0	0	0	0	77	42	0
109	US 15-501/Sage Road	272	1277	107	99	1484	136	197	122	23	0	215	108	120
110	US 15-501/Eastowne Drive/BCBS	137	1407	11	41	1666	218	3	16	8	0	50	4	44
111	US 15-501/Eastowne Drive/Lakeview Drive	9	1460	3	90	1927	287	6	32	89	0	75	5	6
201	NC 54/Hamilton Road	27	1763	97	42	2191	28	133	26	59	0	61	34	27
202	NC 54/Burning Tree Lane	22	1807	48	197	2169	25	21	5	120	0	26	5	37
203	NC 54/Barbee Chapel Road Ext	159	1650	49	67	2261	37	17	0	1	0	8	1	113
204	NC 54/Meadowmont Lane	173	1484	126	434	2226	142	55	30	24	0	63	20	141
205	NC 54/Barbee Chapel Road (East)	21	1439	222	63	2258	194	528	76	57	0	109	28	22
301	US 15-501/Culbreth Road/Mt Carmel Church Road	210	88	45	20	84	585	48	1455	4	0	317	840	203
302	US 15-501/Bennett Road/Arlen Park Drive	88	19	6	64	18	7	4	1362	86	0	64	833	61
303	US 15-501/Market Street	212	0	42	0	0	0	181	1136	0	6	0	577	370

Table 4-8: Future No-Build Year 2024 Turning Movement Volumes (Continued)

PM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
1	Columbia Street/Rosemary Street	195	13	155	23	9	25	159	459	29	0	19	342	189
2	Columbia Street/Franklin Street	118	463	69	130	429	211	57	299	105	0	229	239	69
3	Franklin Street/Raleigh Street	37	570	212	47	612	262	124	289	60	0	139	254	26
4	Merritt Mill Road/Cameron Avenue	0	0	0	316	0	194	0	142	170	0	67	286	0
5	Cameron Avenue/Pittsboro Street	0	152	157	474	384	0	0	0	0	0	0	0	0
6	Cameron Avenue/Columbia Street	20	126	0	0	196	43	213	495	68	0	110	0	437
7	Cameron Avenue/Raleigh Street	34	170	48	31	139	303	64	133	58	0	293	167	60
8	Pittsboro Street/McCauley Street	0	81	21	240	227	0	0	0	0	0	192	459	31
9	Columbia Street/South Road	52	323	0	0	434	238	129	531	135	0	0	0	0
10	Raleigh Street/South Road	91	314	0	0	300	89	0	0	0	0	75	0	149
11	Country Club Road/South Road	29	376	40	225	346	475	22	124	287	0	486	107	13
12	Columbia Street/Manning Drive	67	185	0	213	0	366	0	319	40	0	0	0	0
13	Manning Drive/West Drive	12	192	19	13	494	8	53	1	14	0	6	5	27
14	Manning Drive/East Drive	31	212	51	84	424	46	105	34	380	0	0	0	0
15	Ridge Road/Manning Drive	177	713	54	12	152	57	119	138	38	0	106	80	186
16	Mason Farm Road/Columbia Street	1	0	6	431	7	84	20	352	101	0	84	716	9
17	Mason Farm Road/West Drive	9	162	8	4	445	49	0	0	0	0	24	0	11
18	Mason Farm Rod/East Drive	18	217	91	95	214	11	69	3	27	0	0	0	0
19	Mason Farm Road and Purefoy Road	25	0	39	0	0	0	14	85	0	0	0	294	57
20	Manning Drive/Skipper Bowles Drive	0	842	12	47	191	0	11	0	197	0	0	0	0
21	Columbia Street/Purefoy Road	0	0	0	52	0	27	0	368	41	0	11	1121	0
22	Columbia Street/Fordham Boulevard WB Ramps	0	0	0	887	3	41	324	373	0	0	0	749	374
23	Columbia Street/Fordham Boulevard EB Ramps	116	0	274	0	0	0	0	601	0	0	98	1571	0
24	Mason Farm Road/Fordham Boulevard	0	1565	0	0	2120	50	0	0	0	0	0	0	112
25	Manning Drive/Fordham Boulevard	92	1581	1	15	1962	113	13	0	22	0	846	3	236
26	Mason Farm Road/Oteys Road	11	82	120	3	38	5	10	1	0	0	10	7	23
27	Franklin Street/Boundary	16	559	11	27	791	138	12	71	103	0	70	17	6
28	Franklin Street/Park Place	0	728	2	22	960	0	0	0	59	0	0	0	0
29	Battle Lane/Boundary Street	0	0	0	65	34	0	0	144	106	0	1	88	23
30	Country Club Road/Battle Lane	96	421	0	0	425	255	0	0	0	0	153	0	0
307	Country Club Road/Boundary Street	0	517	0	0	425	0	0	0	0	0	0	0	57
31	Country Club Road/Gimghoul Road	29	2	61	11	2	9	21	614	5	0	7	526	20
32	Manning Drive/Hibbard Drive	28	561	9	18	525	39	22	2	40	0	28	22	62
33	Manning Drive/Craige Drive	16	771	18	24	433	28	34	7	149	0	21	16	12
34	East Drive/Jackson Circle/Dogwood Deck Entrance	0	0	0	1	0	6	7	536	1	0	4	61	83
35	East Drive/Dogwood Deck Exit	240	0	162	0	0	0	0	214	0	0	0	62	0
36	Mason Farm Road/Hibbard Drive	17	170	1	0	77	35	3	3	10	0	134	0	38
37	South Road/Bell Tower Drive	0	427	45	49	476	0	133	0	106	0	0	0	0
38	Manning Drive/New East Drive	0	217	0	0	526	0	0	0	0	0	76	0	51
39	Manning Drive/Craige Deck	0	589	11	16	426	0	103	0	208	0	0	0	0
101	US 15-501/Estes Drive	210	5	385	5	6	10	272	1544	2	0	12	1307	113
102	US 15-501/Willow Drive	151	26	23	34	42	32	110	1556	87	0	44	1337	242
103	US 15-501/Elliot Road	112	86	233	65	83	147	224	1387	181	6	107	1205	137
104	US 15-501/Ephesus Church Road	124	53	127	257	79	26	190	1172	234	0	63	955	27
105	US 15-501/Erwin Road	0	0	0	0	1590	474	0	0	0	0	0	0	415
106	US 15-501/Europa Drive	0	2352	87	0	0	0	0	0	267	0	0	0	0
107	US 15-501/Superstreet NB U-Turn	0	0	0	0	1659	0	361	0	0	0	0	0	0
108	US 15-501/Superstreet SB U-Turn	0	2349	0	0	0	0	0	0	0	0	62	102	0
109	US 15-501/Sage Road	388	1567	250	89	1321	257	213	189	30	0	198	180	122
110	US 15-501/Eastowne Drive/BCBS	33	1784	16	96	1575	51	6	29	88	0	130	28	100
111	US 15-501/Eastowne Drive/Lakeview Drive	1	1997	10	86	1685	123	12	25	105	0	242	17	11
201	NC 54/Hamilton Road	27	2266	52	63	1824	42	148	14	88	0	121	14	30
202	NC 54/Burning Tree Lane	59	2660	23	208	1763	27	39	11	142	0	34	14	35
203	NC 54/Barbee Chapel Road Ext	177	2328	16	8	2129	14	43	11	43	0	29	1	138
204	NC 54/Meadowmont Lane	111	2311	42	35	1695	107	97	17	340	0	119	26	154
205	NC 54/Barbee Chapel Road (East)	12	2168	770	149	1837	188	296	80	57	0	105	90	25
301	US 15-501/Culbreth Road/Mt Carmel Church Road	106	85	51	23	85	399	48	903	6	0	540	1497	196
302	US 15-501/Bennett Road/Arlen Park Drive	72	13	3	81	16	4	14	782	118	0	58	1394	119
303	US 15-501/Market Street	317	0	120	0	0	0	138	544	0	11	0	1235	305

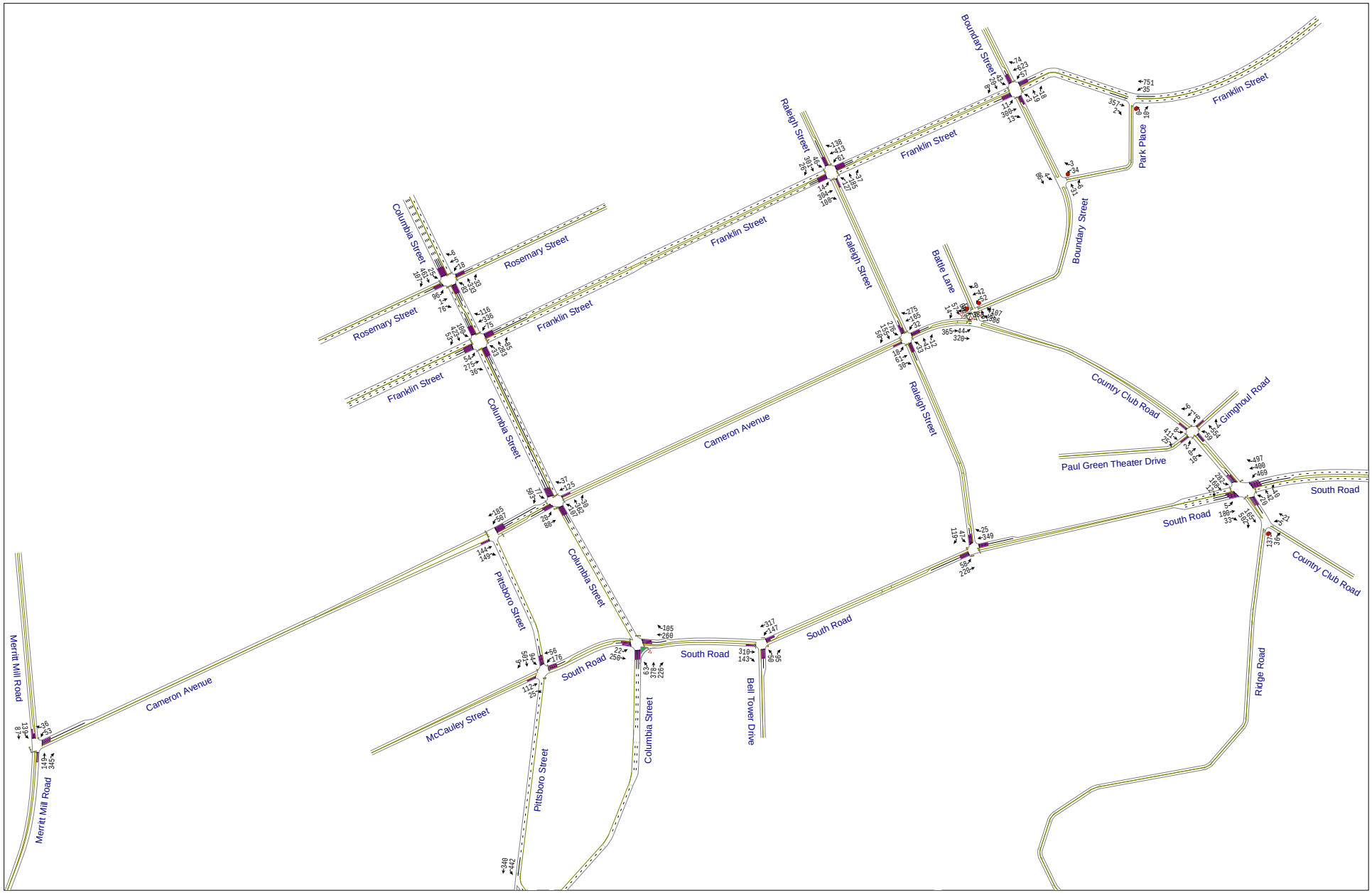


Figure 4-7a
Future No-Build Year 2030 A.M. Peak Hour Turning Movement Volumes

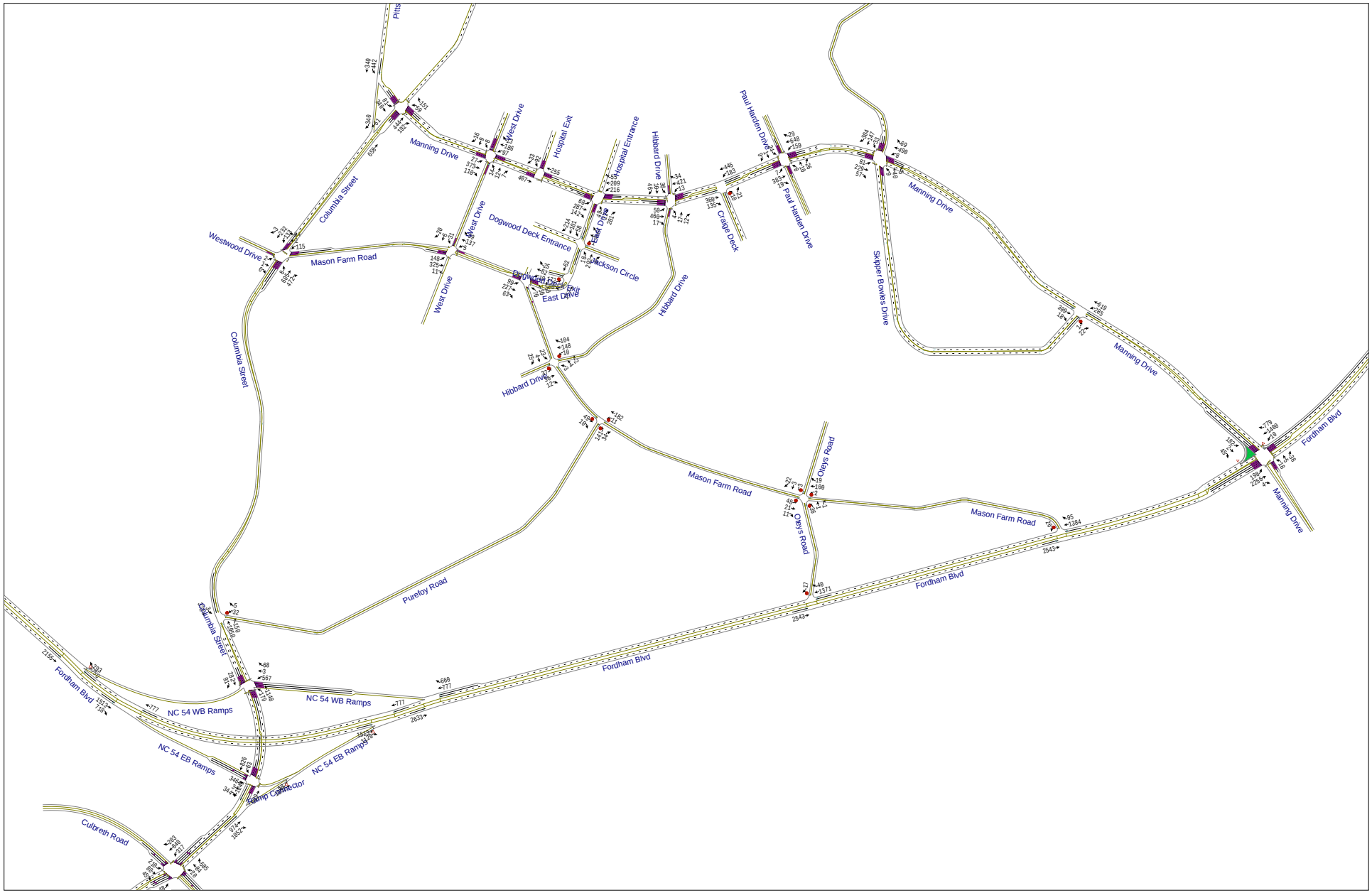


Figure 4-7b
Future No-Build Year 2030 A.M. Peak Hour Turning Movement Volumes

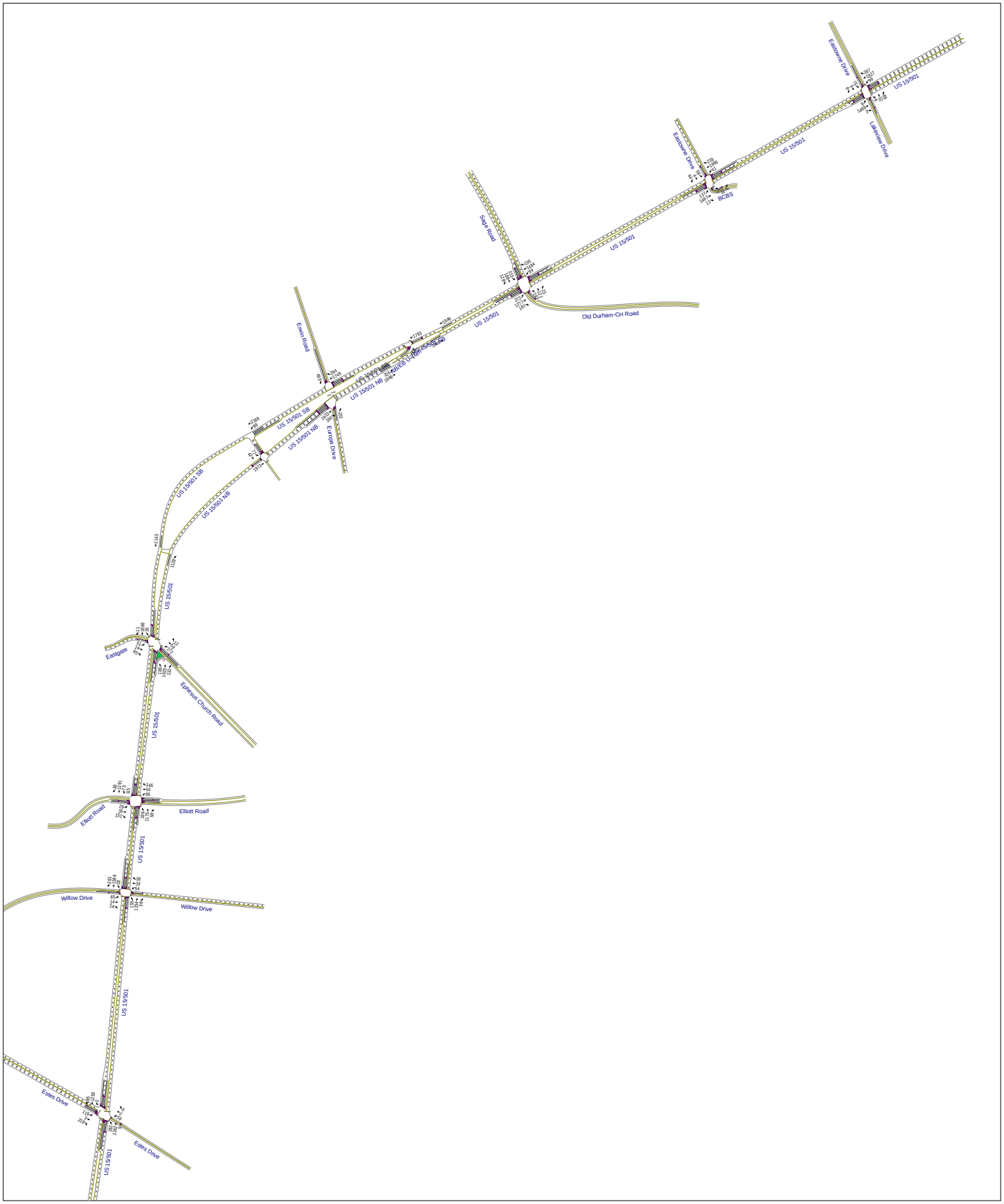


Figure 4-7c
Future No-Build Year 2030 A.M. Peak Hour Turning Movement Volumes

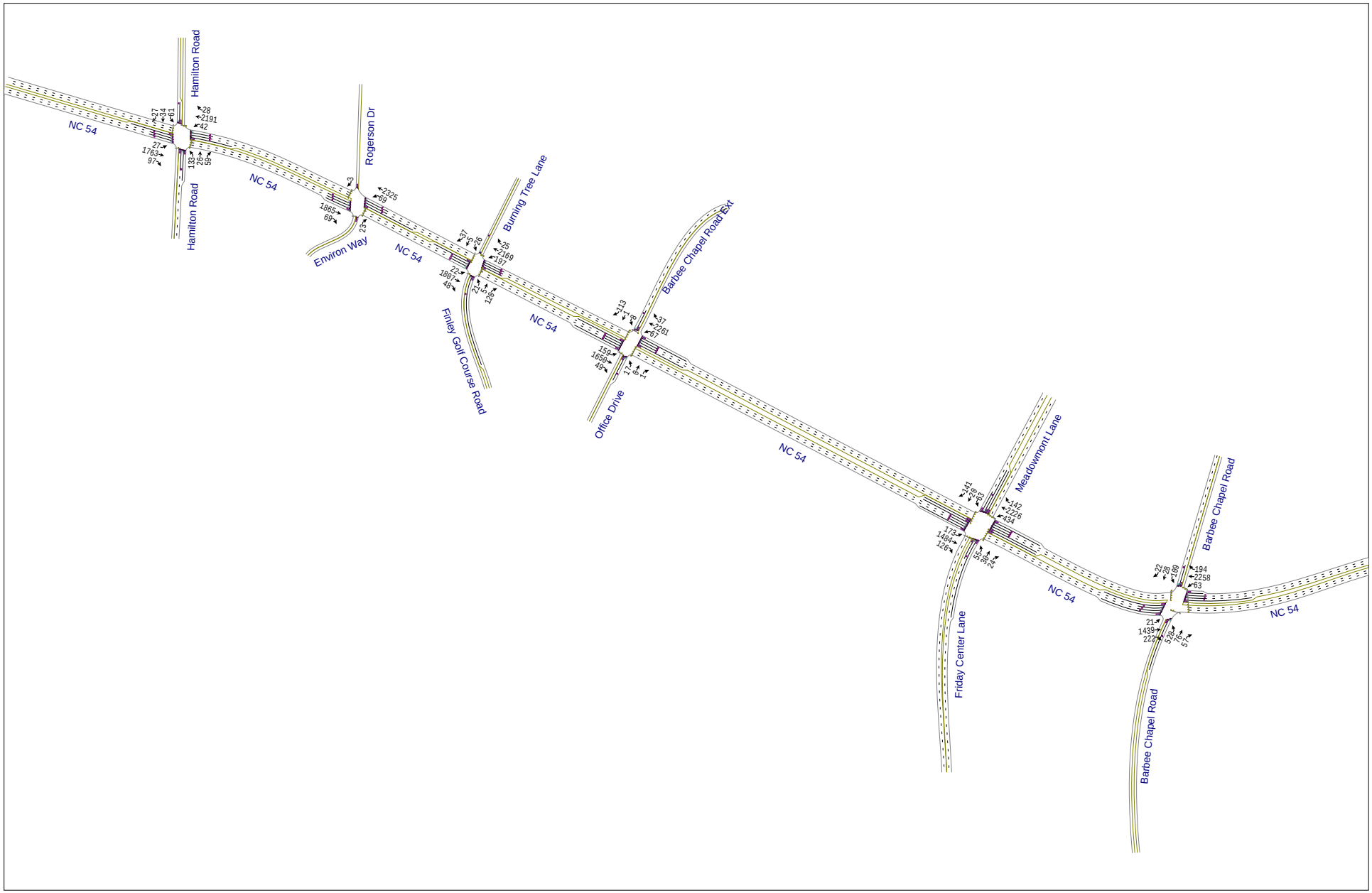


Figure 4-7d
Future No-Build Year 2030 A.M. Peak Hour Turning Movement Volumes

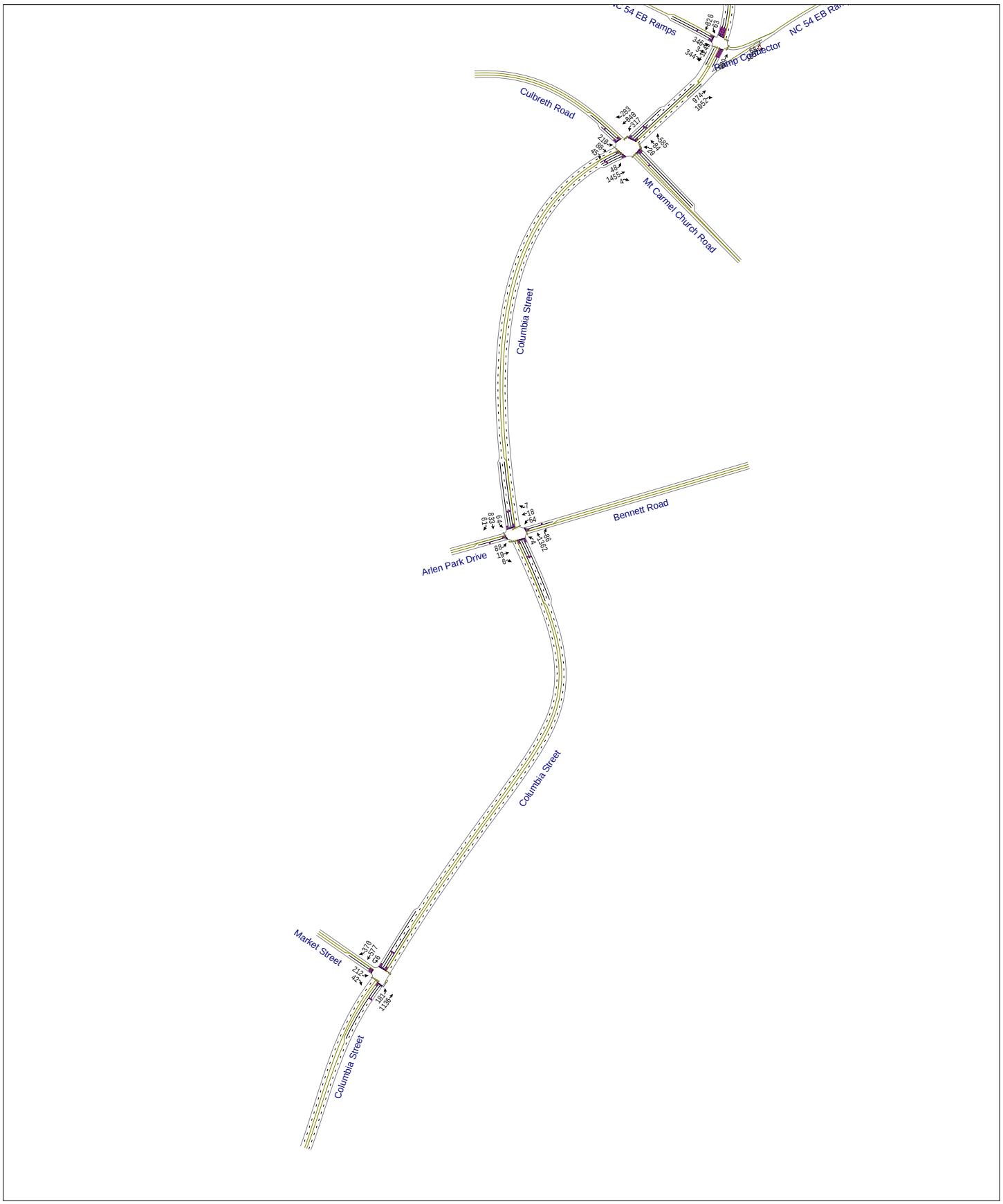


Figure 4-7e
Future No-Build Year 2030 A.M. Peak Hour Turning Movement Volumes

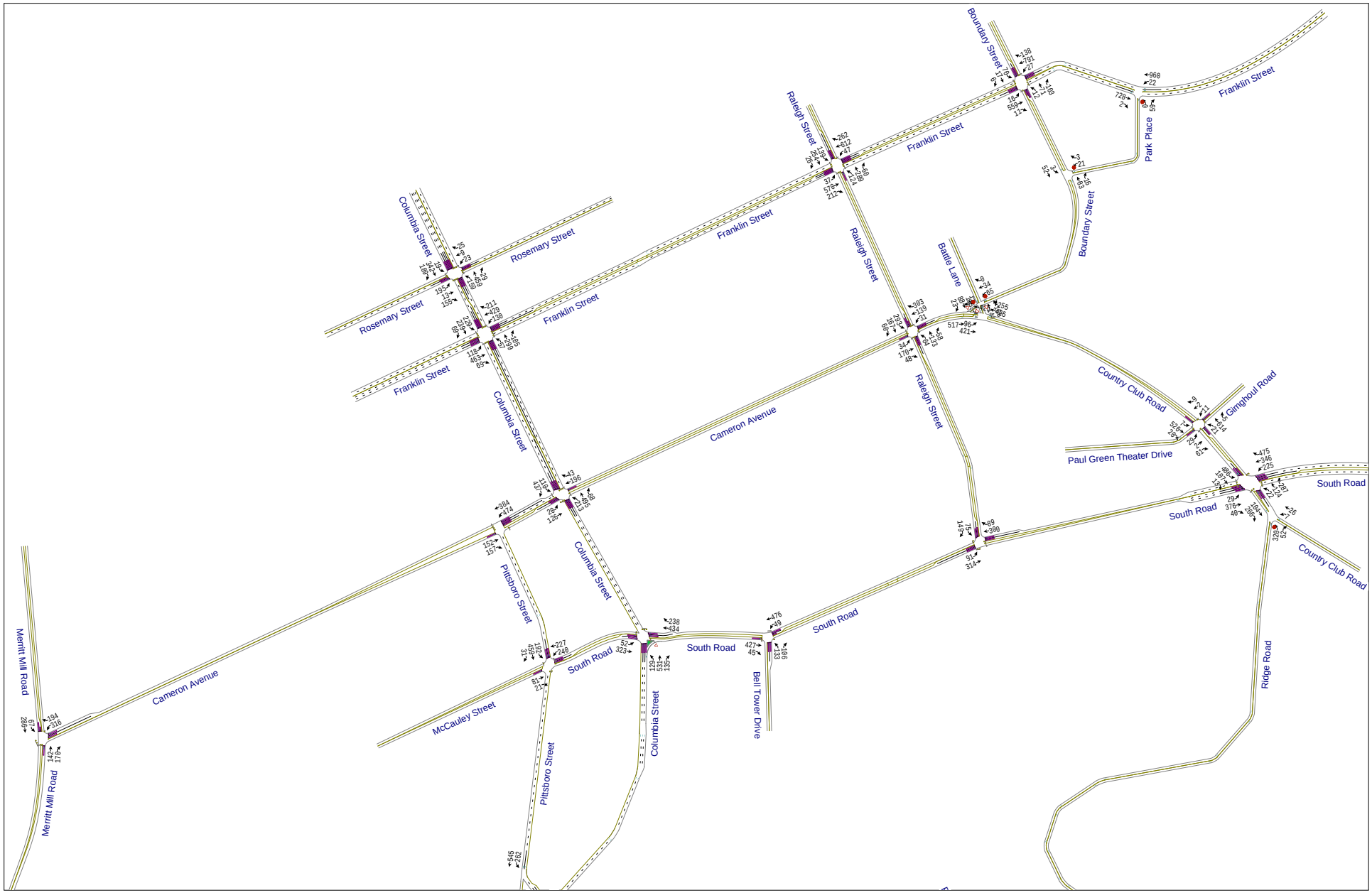


Figure 4-8a
Future No-Build Year 2030 P.M. Peak Hour Turning Movement Volumes

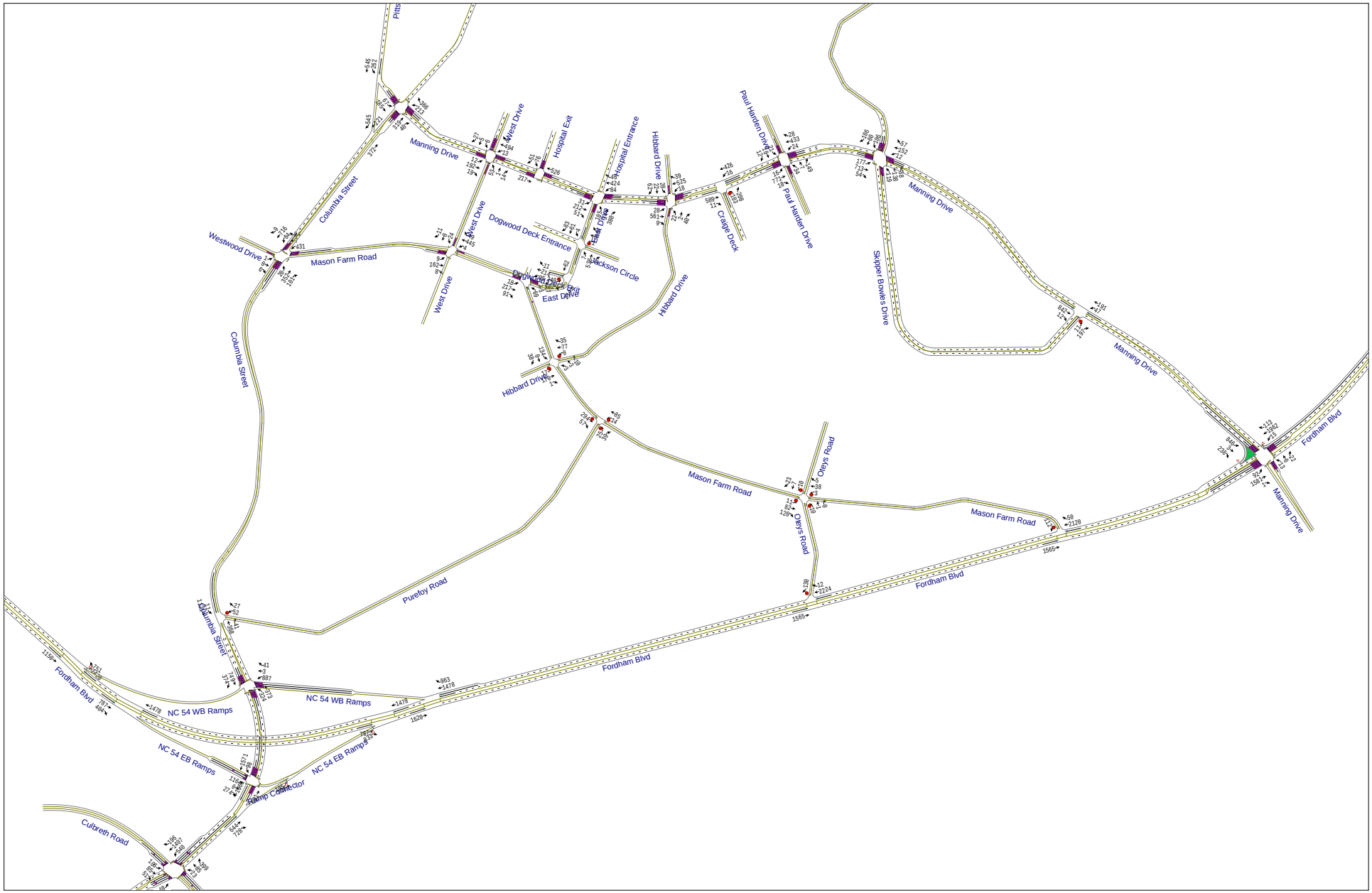


Figure 4-8b
Future No-Build Year 2030 P.M. Peak Hour Turning Movement Volumes

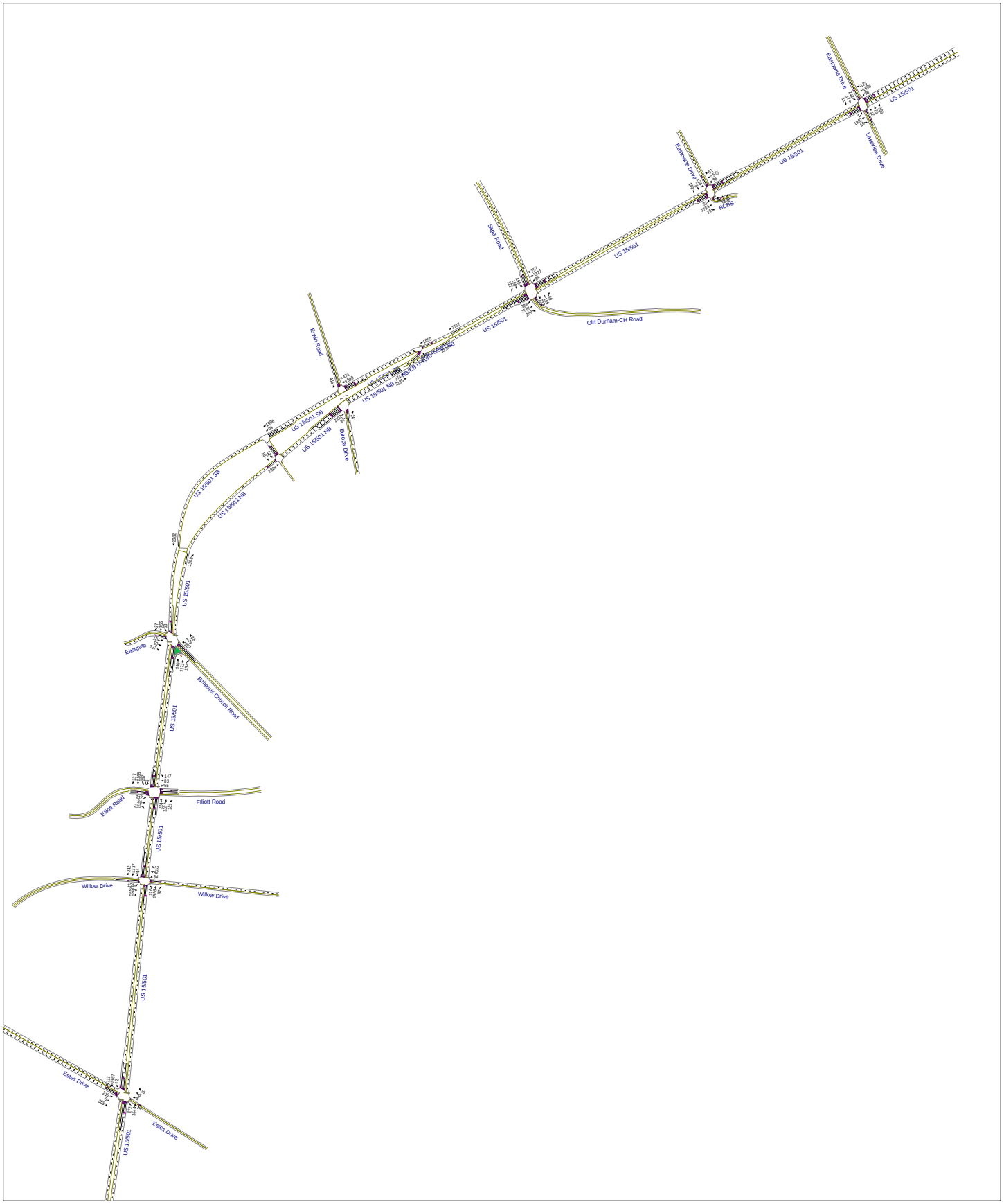


Figure 4-8c
Future No-Build Year 2030 P.M. Peak Hour Turning Movement Volumes

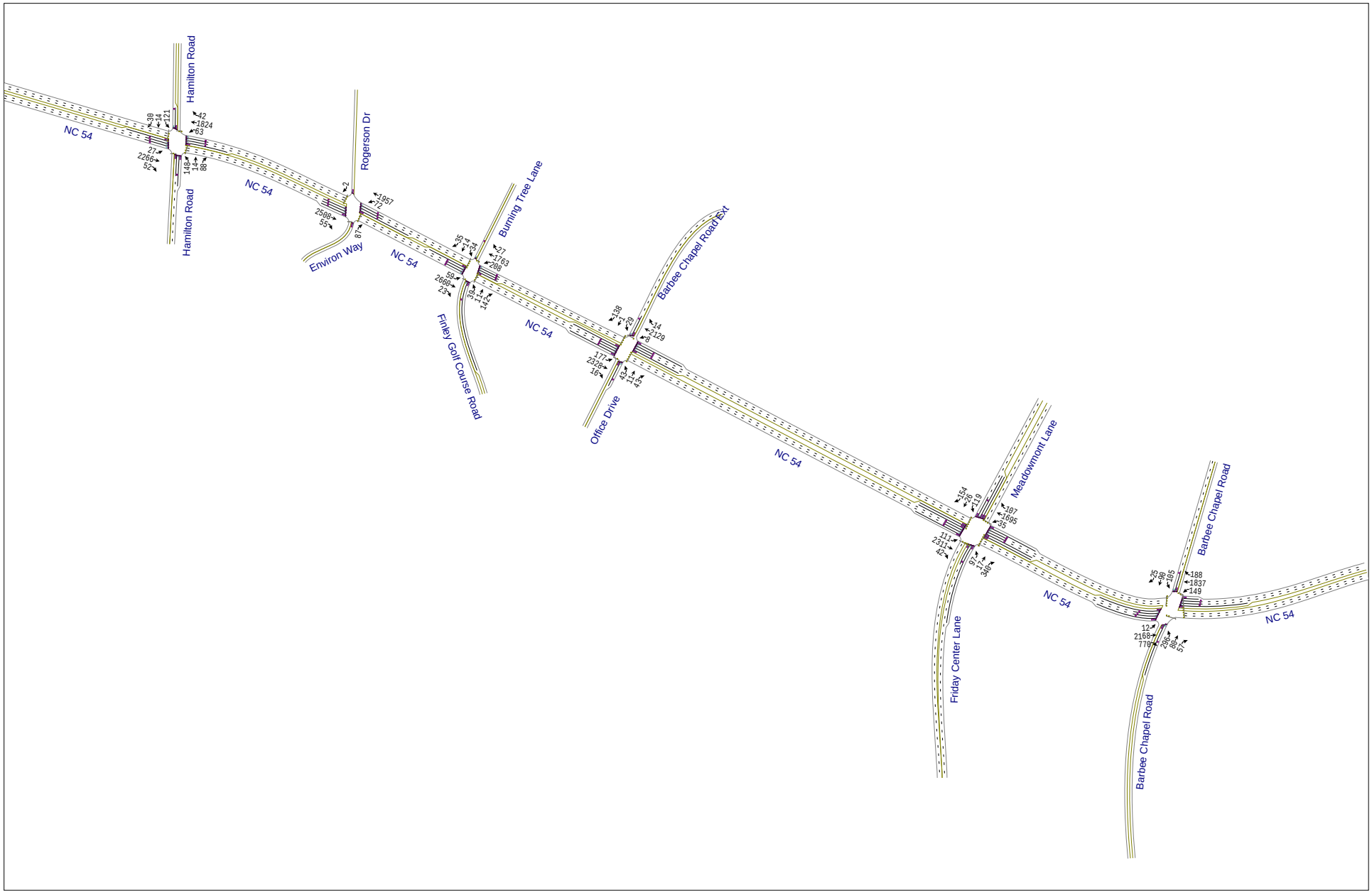


Figure 4-8d
Future No-Build Year 2030 P.M. Peak Hour Turning Movement Volumes

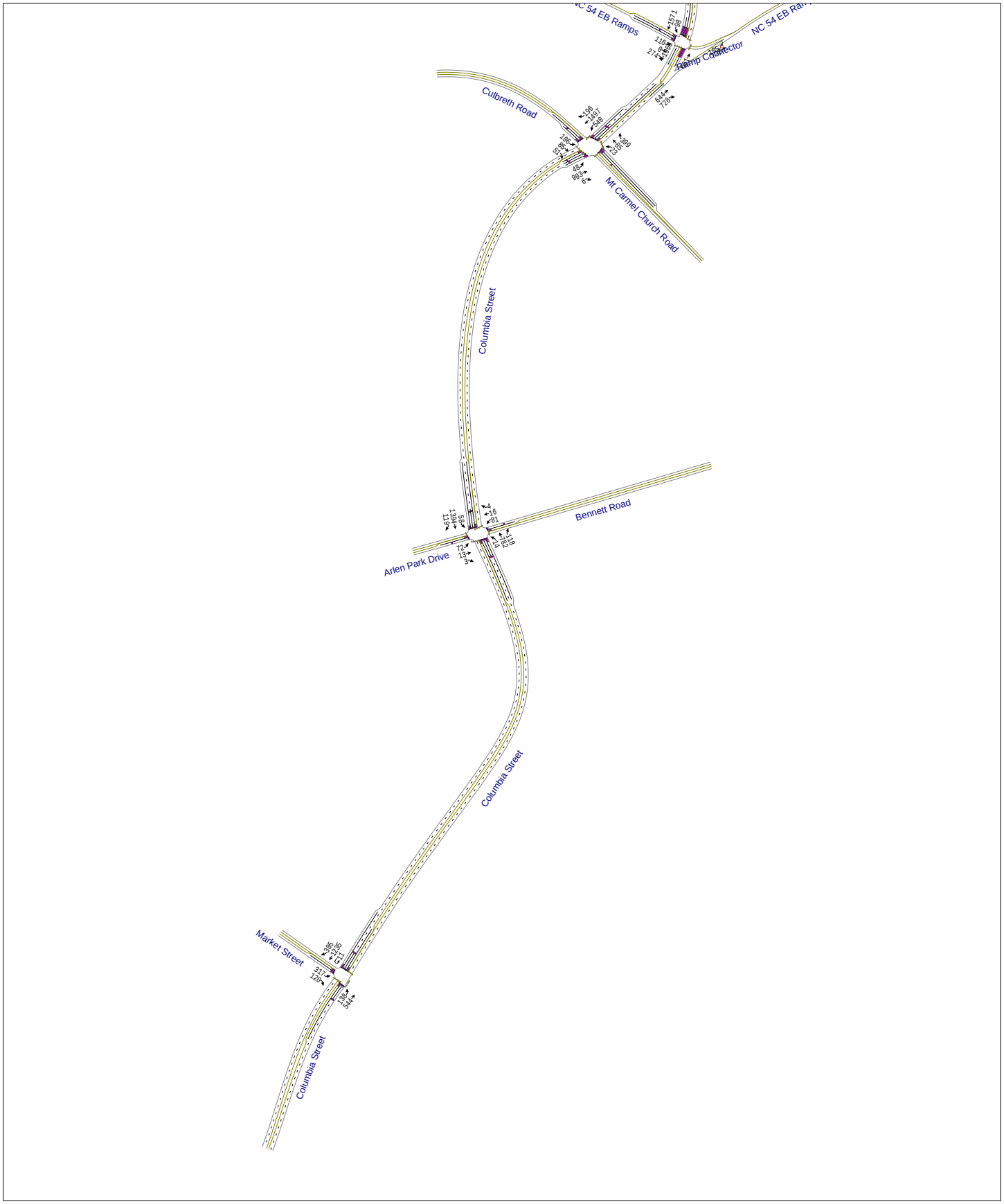


Figure 4-8e
Future No-Build Year 2030 P.M. Peak Hour Turning Movement Volumes

4.5.2 Build Scenario

The development of the 2030 Build scenario turning movement volumes included the following steps:

- The 2030 No-Build volumes (Table 4-8) were used as a base, accounting for existing volumes, re-routed West Drive volumes, and future annual growth.

- The future parking generated trips (as described in Section 4.4) were added to the 2030 No-Build volumes to yield 2030 Build volumes.

The Build scenario traffic volumes for the AM and PM peak hours are listed in Table 4-10 and illustrated in Figure 4-10 and Figure 4-11. The increase in traffic along the majority of campus roads will be minimal, though increases in individual turning movements at some intersections near proposed parking facilities may be significant. In some areas where parking is being eliminated, some turning movements will decrease compared to the No-Build scenario.

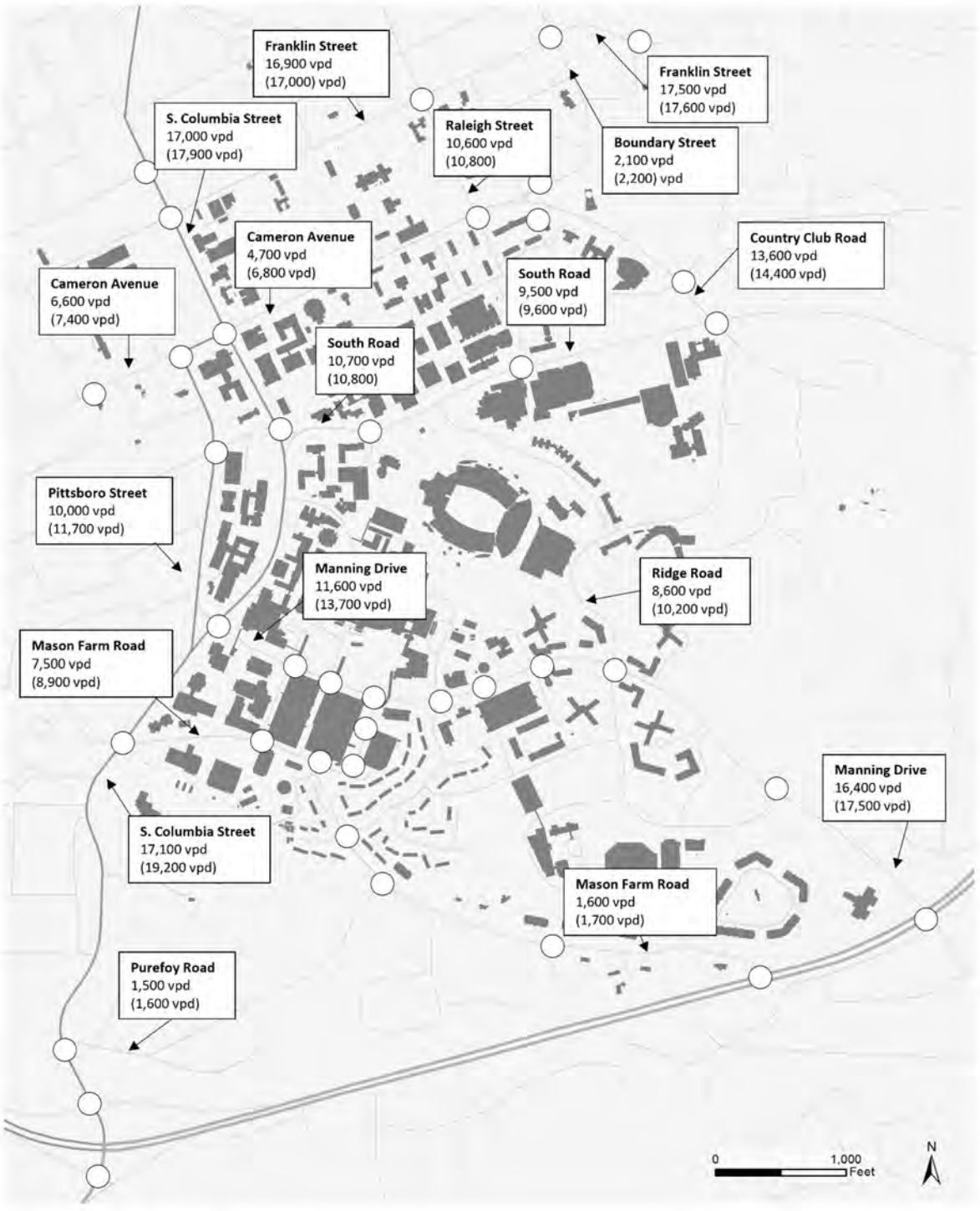
The largest increases in traffic volumes will be experienced on the major arteries serving Campus.

The annual growth rates and projected future ADTs for study area roads are listed in Table 4-9 and are displayed in Figure 4-9.

Table 4-9: Existing and Future (2030) Average Daily Traffic Volumes

Link #	Roadway	2001 ADT	2003 ADT	2005 ADT	2006 ADT	2007 ADT	2009 ADT	2011 ADT	2013 ADT	2015 ADT	2017 ADT	2019 ADT	2023 ADT	2023-2030 Annual Growth Rate	Projected 2030 No-Build ADT	Projected 2030 Build ADT	2001-2009 AGR
1	S. Columbia St. (south of Franklin St.)	20,720	19,060	17,530	-	17,530	15,410	14,380	14,663	16,329	15,783	15,220	12,996	1.7%	14,500	15,300	-3.6%
2	Raleigh St. (south of Franklin St.)	14,470	10,710	13,080	13,080	11,020	11,710	9,910	10,514	10,450	11,031	10,175	10,543	0.6%	11,000	11,200	-2.6%
3	Cameron Ave. (west of Pittsboro St.)	9,820	8,300	8,510	-	7,630	9,260	7,220	6,693	7,558	7,710	6,265	6,230	0.9%	6,600	7,400	-0.7%
4	Cameron Ave. (east of S. Columbia St.)	9,070	8,330	6,430	6,430	5,270	5,540	5,910	4,679	4,881	4,616	4,327	5,780	1.2%	6,300	9,100	-6.0%
5	Country Club Rd. (north of South Rd.)	13,470	14,080	12,200	12,200	12,990	11,960	11,260	10,726	12,534	13,060	12,945	13,024	0.7%	13,600	14,400	-1.5%
6	South Rd. (east of Columbia St.)	10,460	8,840	11,400	-	8,400	7,430	8,370	8,593	9,649	9,209	9,561	9,082	1.7%	10,200	10,300	-4.2%
7	South Rd. (east of Raleigh St.)	9,840	10,000	12,890	12,890	7,500	7,510	7,730	7,944	7,744	7,802	8,337	7,855	2.0%	9,000	9,100	-3.3%
8	Pittsboro St. (south of McCauley St.)	10,960	10,070	10,920	-	9,550	9,750	8,810	8,061	8,487	8,632	9,087	8,196	1.4%	9,000	10,500	-1.5%
9	Manning Dr. (east of Columbia St.)	14,100	13,220	12,480	12,480	11,070	11,060	10,020	10,713	11,298	11,828	10,565	8,794	1.4%	9,600	11,300	-3.0%
10	Ridge Rd. (north of Manning Dr.)	8,320	7,870	7,300	7,300	7,910	8,730	8,110	7,819	7,216	7,594	7,524	7,132	2.0%	8,200	9,700	0.6%
11	S. Columbia St. (south of Mason Farm Rd.)	18,470	18,250	16,190	-	16,090	15,430	14,760	13,982	15,480	16,285	16,626	15,653	1.3%	17,100	19,200	-2.2%
12	Manning Dr. (east of Ridge Rd.)	17,260	14,680	17,880	17,880	15,680	16,150	14,660	15,734	15,879	17,023	16,444	15,346	0.9%	16,400	17,500	-0.8%
13	Franklin St. (west of Raleigh St.)	17,000	19,260	18,850	-	19,320	16,250	14,370	14,605	14,895	16,228	15,987	15,975	0.9%	16,900	17,000	-0.6%
14	Franklin St. (east of Boundary St.)	-	23,560	20,190	20,190	24,730	17,390	16,770	16,614	16,620	16,327	16,557	17,940	0.9%	19,000	19,100	-4.9%
15	Boundary St. (south of Franklin St.)	-	3,230	2,320	2,320	2,140	2,230	2,400	2,225	2,008	2,581	2,042	1,878	0.6%	2,000	2,100	-6.0%
16	Mason Farm Rd.(east of S. Columbia St.)	7,700	8,230	3,400	3,400	8,390	7,330	6,910	6,314	6,755	6,746	6,948	6,584	2.0%	7,500	8,900	-0.6%
17	Mason Farm Rd. (north of Fordham Blvd.)	1,360	770	1,830	-	1,820	1,770	1,730	1,720	1,546	1,596	1,814	1,578	0.4%	1,600	1,700	3.3%
18	Purefoy Rd. (east of Columbia St.)	970	970	1,130	-	1,360	1,450	2,070	1,705	1,747	2,044	1,723	1,448	0.4%	1,500	1,600	5.2%
19	US 15-501 (west of Main St.)	-	-	-	-	17,840	17,080	16,770	19,993	20,801	22,587	22,513	20,956	2.0%	23,900	24,400	-2.2%
20	US 15-501 (east of Culbreth Rd.)	30,480	-	30,000	-	30,310	30,570	28,390	31,867	35,429	38,238	38,245	35,362	2.0%	40,300	41,400	0.0%
21	NC 54 (west of Hamilton Rd.)	45,400	-	44,000	-	47,940	43,470	41,230	41,388	48,286	51,099	51,879	48,506	2.0%	55,300	57,700	-0.5%
22	NC 54 (east of East Barbee Chapel Hill Rd.)	-	-	-	-	32,100	37,390	36,320	39,967	44,174	46,875	47,247	44,547	2.0%	50,800	52,900	7.9%

Figure 4-9: Future (2030) Average Daily Traffic Volumes



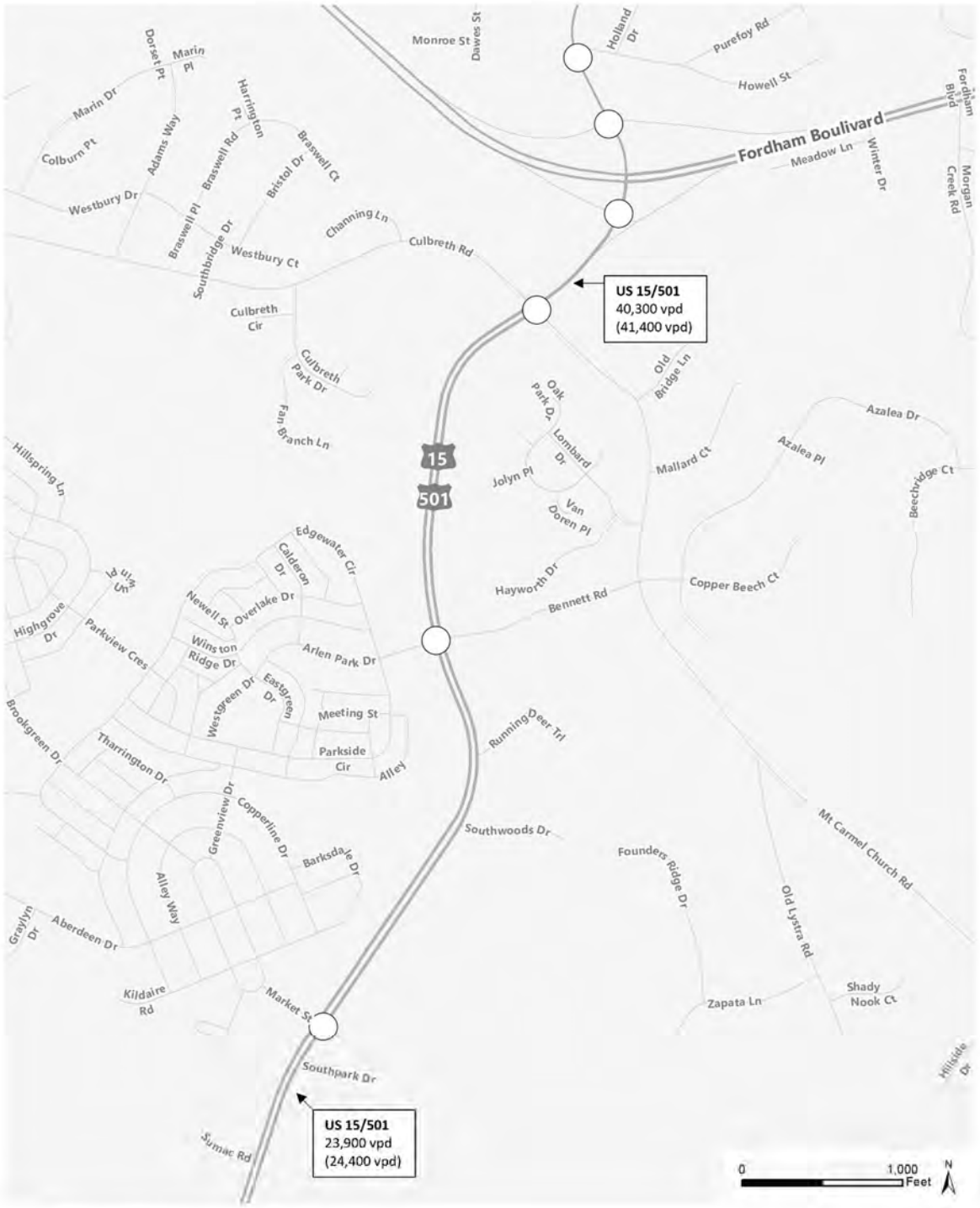
2030 No-Build Vehicles Per Day
(2030 Build Vehicles Per Day)

Figure 4-9: Future (2030) Average Daily Traffic Volumes (Continued)



2030 No-Build Vehicles Per Day
(2030 Build Vehicles Per Day)

Figure 4-9: Future (2030) Average Daily Traffic Volumes (Continued)



2030 No-Build Vehicles Per Day
(2030 Build Vehicles Per Day)

Table 4-10: Future Build Year 2030 Turning Movement Volumes

AM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
1	Columbia Street/Rosemary Street	96	1	83	18	5	6	84	347	33	0	25	502	107
2	Columbia Street/Franklin Street	54	275	52	75	336	116	38	298	79	0	100	471	53
3	Franklin Street/Raleigh Street	14	304	108	61	413	138	127	192	37	0	46	301	26
4	Merritt Mill Road/Cameron Avenue	0	0	0	64	0	43	0	149	375	0	162	87	0
5	Cameron Avenue/Pittsboro Street	0	157	189	660	203	0	0	0	0	0	0	0	0
6	Cameron Avenue/Columbia Street	20	101	0	0	232	40	120	373	102	0	90	0	554
7	Cameron Avenue/Raleigh Street	26	101	30	32	291	274	33	42	12	0	276	152	76
8	Pittsboro Street/McCauley Street	0	116	37	176	60	0	0	0	0	0	94	693	10
9	Columbia Street/South Road	26	250	0	0	260	105	67	470	226	0	0	0	0
10	Raleigh Street/South Road	58	220	0	0	349	25	0	0	0	0	47	0	116
11	Country Club Road/South Road	5	180	33	612	400	538	20	39	84	0	295	161	12
12	Columbia Street/Manning Drive	94	339	0	59	0	195	0	481	291	0	0	0	0
13	Manning Drive/West Drive	267	362	110	179	245	226	14	12	7	0	8	9	16
14	Manning Drive/East Drive	68	341	142	216	493	55	49	22	232	0	0	0	0
15	Ridge Road/Manning Drive	130	283	39	0	616	69	6	32	0	0	41	111	465
16	Mason Farm Road/Columbia Street	2	1	6	159	2	82	8	723	519	0	201	238	3
17	Mason Farm Road/West Drive	148	356	11	5	187	39	0	0	0	0	31	6	102
18	Mason Farm Rod/East Drive	99	258	63	10	82	25	120	30	60	0	0	0	0
19	Mason Farm Road and Purefoy Road	141	0	34	0	0	0	11	232	0	0	0	49	1
20	Manning Drive/Skipper Bowles Drive	0	341	26	365	589	0	1	0	33	0	0	0	0
21	Columbia Street/Purefoy Road	0	0	0	23	0	5	0	1215	150	0	3	422	0
22	Columbia Street/Fordham Boulevard WB Ramps	0	0	0	570	3	68	179	1313	0	0	0	305	109
23	Columbia Street/Fordham Boulevard EB Ramps	406	3	344	0	0	0	0	1014	0	0	63	852	0
24	Mason Farm Road/Fordham Boulevard	0	2505	0	0	1433	95	0	0	0	0	0	0	26
25	Manning Drive/Fordham Boulevard	160	2256	4	10	1450	867	18	5	38	0	226	2	44
26	Mason Farm Road/Oteys Road	48	21	11	2	100	19	86	1	1	0	3	3	22
27	Franklin Street/Boundary	11	300	13	57	623	74	3	19	18	0	43	20	8
28	Franklin Street/Park Place	0	357	2	113	751	0	0	0	35	0	0	0	0
29	Battle Lane/Boundary Street	0	0	0	45	127	0	0	67	62	0	0	57	14
30	Country Club Road/Battle Lane	71	333	0	0	426	105	0	0	0	0	102	0	0
307	Country Club Road/Boundary Street	0	405	0	0	426	0	0	0	0	0	0	0	142
31	Country Club Road/Gimghoul Road	2	0	10	6	1	6	59	592	4	0	8	417	25
32	Manning Drive/Hibbard Drive	50	545	17	13	705	34	4	17	12	0	36	10	46
33	Manning Drive/Craige Drive	7	468	19	159	932	29	8	10	26	0	24	1	9
34	East Drive/Jackson Circle/Dogwood Deck Entrance	0	0	0	1	0	1	18	323	4	0	58	101	214
35	East Drive/Dogwood Deck Exit	172	0	96	0	0	0	0	188	0	0	0	62	0
36	Mason Farm Road/Hibbard Drive	37	36	12	1	148	104	53	4	2	0	23	4	25
37	South Road/Bell Tower Drive	0	310	143	147	317	0	50	0	95	0	0	0	0
38	Manning Drive/New East Drive	0	396	0	0	539	0	0	0	0	0	157	0	103
39	Manning Drive/Craige Deck	0	445	135	183	729	0	10	0	21	0	0	0	0
101	US 15-501/Estes Drive	119	3	219	10	2	5	262	1318	5	0	2	1436	85
102	US 15-501/Willow Drive	65	14	24	54	39	38	155	1310	36	0	28	1547	263
103	US 15-501/Elliot Road	29	35	151	95	55	146	106	1231	58	5	73	1469	30
104	US 15-501/Ephesus Church Road	51	24	85	190	50	13	100	1075	138	0	35	1220	11
105	US 15-501/Erwin Road	0	0	0	0	1963	302	0	0	0	0	0	0	509
106	US 15-501/Europa Drive	0	2007	104	0	0	0	0	0	153	0	0	0	0
107	US 15-501/Superstreet NB U-Turn	0	0	0	0	1997	0	322	0	0	0	0	0	0
108	US 15-501/Superstreet SB U-Turn	0	2047	0	0	0	0	0	0	0	0	77	42	0
109	US 15-501/Sage Road	275	1334	114	99	1666	136	218	122	23	0	215	108	131
110	US 15-501/Eastowne Drive/BCBS	137	1464	11	41	1848	218	3	16	8	0	50	4	44
111	US 15-501/Eastowne Drive/Lakeview Drive	9	1517	3	90	2109	287	6	32	89	0	75	5	6
201	NC 54/Hamilton Road	27	1806	99	42	2329	28	140	26	59	0	61	34	27
202	NC 54/Burning Tree Lane	22	1850	48	197	2307	25	21	5	120	0	26	5	37
203	NC 54/Barbee Chapel Road Ext	161	1691	49	67	2392	37	17	0	1	0	8	1	120
204	NC 54/Meadowmont Lane	175	1521	128	434	2343	142	62	30	24	0	63	20	148
205	NC 54/Barbee Chapel Road (East)	21	1474	224	63	2369	194	534	76	57	0	109	28	22
301	US 15-501/Culbreth Road/Mt Carmel Church Road	210	88	45	20	84	617	48	1528	4	0	325	858	203
302	US 15-501/Bennett Road/Arlen Park Drive	88	19	6	64	18	7	4	1435	86	0	64	851	61
303	US 15-501/Market Street	219	0	42	0	0	0	181	1202	0	6	0	592	373

Table 4-10: Future Build Year 2030 Turning Movement Volumes (Continued)

PM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
1	Columbia Street/Rosemary Street	195	13	157	23	9	25	165	493	29	0	19	363	189
2	Columbia Street/Franklin Street	118	463	78	130	429	211	71	339	81	0	229	262	69
3	Franklin Street/Raleigh Street	37	570	212	47	612	262	124	309	60	0	139	254	26
4	Merritt Mill Road/Cameron Avenue	0	0	0	342	0	214	0	142	188	0	80	286	0
5	Cameron Avenue/Pittsboro Street	0	175	165	572	430	0	0	0	0	0	0	0	0
6	Cameron Avenue/Columbia Street	20	149	0	0	305	58	239	510	204	0	133	0	446
7	Cameron Avenue/Raleigh Street	53	301	48	31	259	304	64	133	58	0	293	165	75
8	Pittsboro Street/McCauley Street	0	88	23	240	235	0	0	0	0	0	192	559	37
9	Columbia Street/South Road	59	323	0	0	434	238	137	701	135	0	0	0	0
10	Raleigh Street/South Road	91	314	0	0	300	89	0	0	0	0	75	0	147
11	Country Club Road/South Road	29	376	40	254	346	546	22	118	382	0	545	101	13
12	Columbia Street/Manning Drive	126	179	0	213	0	461	0	396	67	0	0	0	0
13	Manning Drive/West Drive	76	211	19	98	595	67	53	1	14	0	6	5	27
14	Manning Drive/East Drive	31	382	51	84	507	46	105	34	452	0	0	0	0
15	Ridge Road/Manning Drive	291	853	57	12	219	63	126	107	38	0	106	57	230
16	Mason Farm Road/Columbia Street	1	0	6	536	7	128	20	412	114	0	102	744	9
17	Mason Farm Road/West Drive	9	234	8	4	459	49	0	0	0	0	24	0	96
18	Mason Farm Rod/East Drive	18	289	91	95	214	11	83	3	27	0	0	0	0
19	Mason Farm Road and Purefoy Road	0	0	39	0	0	0	14	55	0	0	0	294	0
20	Manning Drive/Skipper Bowles Drive	0	982	12	67	258	0	17	0	188	0	0	0	0
21	Columbia Street/Purefoy Road	0	0	0	0	0	27	0	441	0	0	11	1254	0
22	Columbia Street/Fordham Boulevard WB Ramps	0	0	0	906	3	41	324	404	0	0	0	790	396
23	Columbia Street/Fordham Boulevard EB Ramps	127	0	274	0	0	0	0	621	0	0	98	1631	0
24	Mason Farm Road/Fordham Boulevard	0	1575	0	0	2120	50	0	0	0	0	0	0	112
25	Manning Drive/Fordham Boulevard	102	1581	1	15	1932	190	13	0	22	0	947	3	266
26	Mason Farm Road/Oteys Road	11	82	120	3	38	5	0	1	0	0	10	7	23
27	Franklin Street/Boundary	16	559	11	27	791	138	12	71	103	0	70	17	6
28	Franklin Street/Park Place	0	728	2	65	960	0	0	0	124	0	0	0	0
29	Battle Lane/Boundary Street	0	0	0	59	83	0	0	144	171	0	1	88	23
30	Country Club Road/Battle Lane	168	480	0	0	497	248	0	0	0	0	147	0	0
307	Country Club Road/Boundary Street	0	648	0	0	497	0	0	0	0	0	0	0	106
31	Country Club Road/Gimghoul Road	29	2	61	11	2	9	21	679	5	0	7	579	20
32	Manning Drive/Hibbard Drive	28	818	0	18	643	39	0	2	40	0	28	22	62
33	Manning Drive/Craige Drive	16	1028	18	24	551	28	34	7	149	0	21	16	12
34	East Drive/Jackson Circle/Dogwood Deck Entrance	0	0	0	1	0	6	7	608	1	0	4	61	83
35	East Drive/Dogwood Deck Exit	240	0	162	0	0	0	0	286	0	0	0	62	0
36	Mason Farm Road/Hibbard Drive	17	170	1	0	77	35	17	0	10	0	134	0	38
37	South Road/Bell Tower Drive	0	427	45	49	476	0	133	0	106	0	0	0	0
38	Manning Drive/New East Drive	0	236	0	0	609	0	0	0	0	0	227	0	213
39	Manning Drive/Craige Deck	0	846	11	16	544	0	103	0	208	0	0	0	0
101	US 15-501/Estes Drive	210	5	385	5	6	10	272	1682	2	0	12	1382	113
102	US 15-501/Willow Drive	151	26	23	34	42	32	110	1694	87	0	44	1412	242
103	US 15-501/Elliot Road	112	86	233	65	83	147	224	1525	181	6	107	1280	137
104	US 15-501/Ephesus Church Road	124	53	127	265	79	26	190	1296	248	0	63	1022	27
105	US 15-501/Erwin Road	0	0	0	0	1689	493	0	0	0	0	0	0	426
106	US 15-501/Europa Drive	0	2541	87	0	0	0	0	0	267	0	0	0	0
107	US 15-501/Superstreet NB U-Turn	0	0	0	0	1758	0	380	0	0	0	0	0	0
108	US 15-501/Superstreet SB U-Turn	0	2538	0	0	0	0	0	0	0	0	62	102	0
109	US 15-501/Sage Road	397	1711	267	89	1405	257	223	189	30	0	198	180	127
110	US 15-501/Eastowne Drive/BCBS	33	1928	16	96	1659	51	6	29	88	0	130	28	100
111	US 15-501/Eastowne Drive/Lakeview Drive	1	2141	10	86	1769	123	12	25	105	0	242	17	11
201	NC 54/Hamilton Road	27	2377	58	63	1892	42	152	14	88	0	121	14	30
202	NC 54/Burning Tree Lane	59	2771	23	208	1831	27	39	11	142	0	34	14	35
203	NC 54/Barbee Chapel Road Ext	183	2433	16	8	2194	14	43	11	43	0	29	1	141
204	NC 54/Meadowmont Lane	116	2406	47	35	1754	107	100	17	340	0	119	26	157
205	NC 54/Barbee Chapel Road (East)	12	2258	775	149	1893	188	299	80	57	0	105	90	25
301	US 15-501/Culbreth Road/Mt Carmel Church Road	106	85	51	23	85	405	48	917	6	0	558	1539	196
302	US 15-501/Bennett Road/Arlen Park Drive	72	13	3	81	16	4	14	796	118	0	58	1436	119
303	US 15-501/Market Street	318	0	120	0	0	0	138	557	0	11	0	1271	311

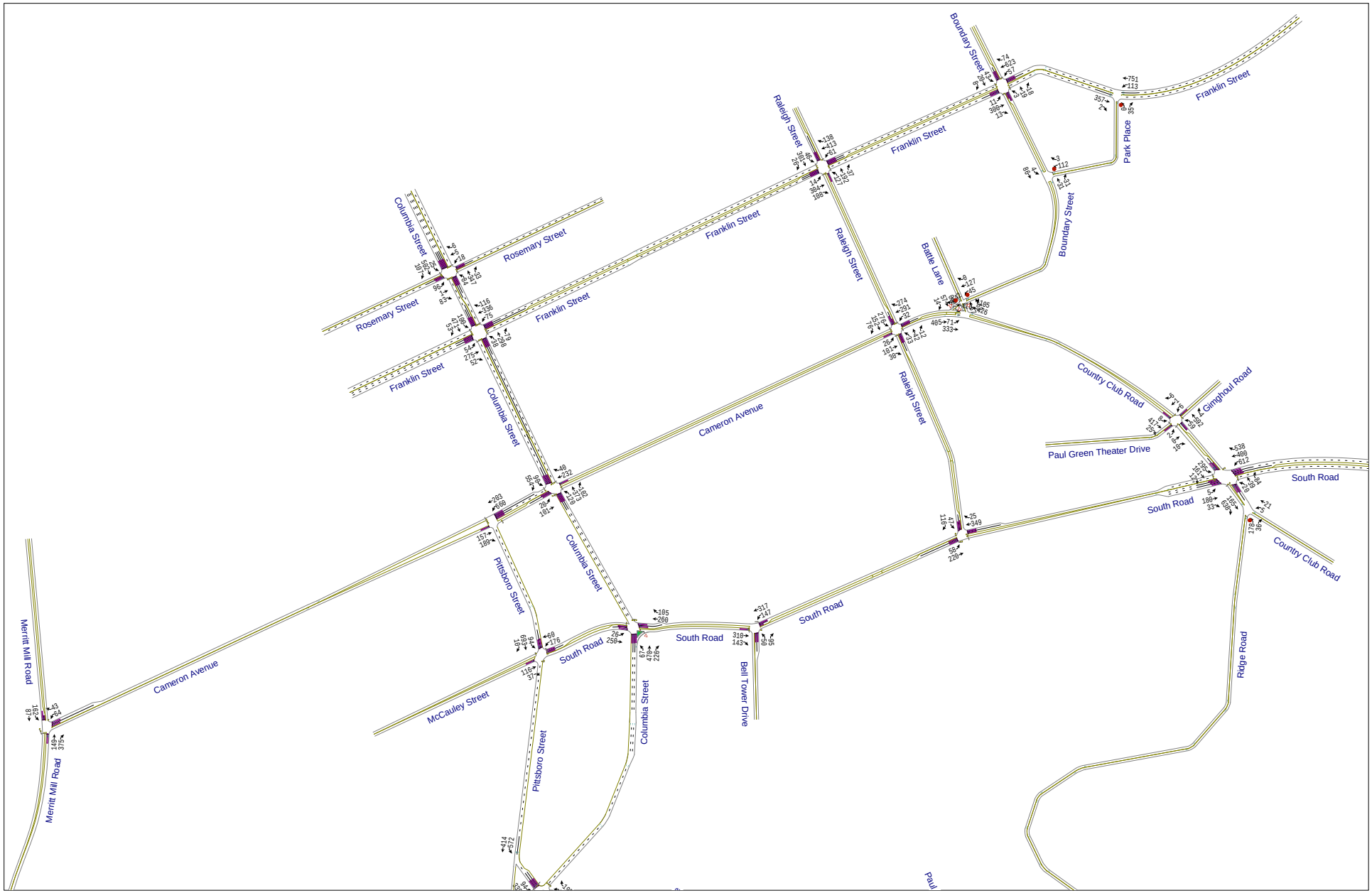


Figure 4-10a
Future Build Year 2030 A.M. Peak Hour Turning Movement Volumes

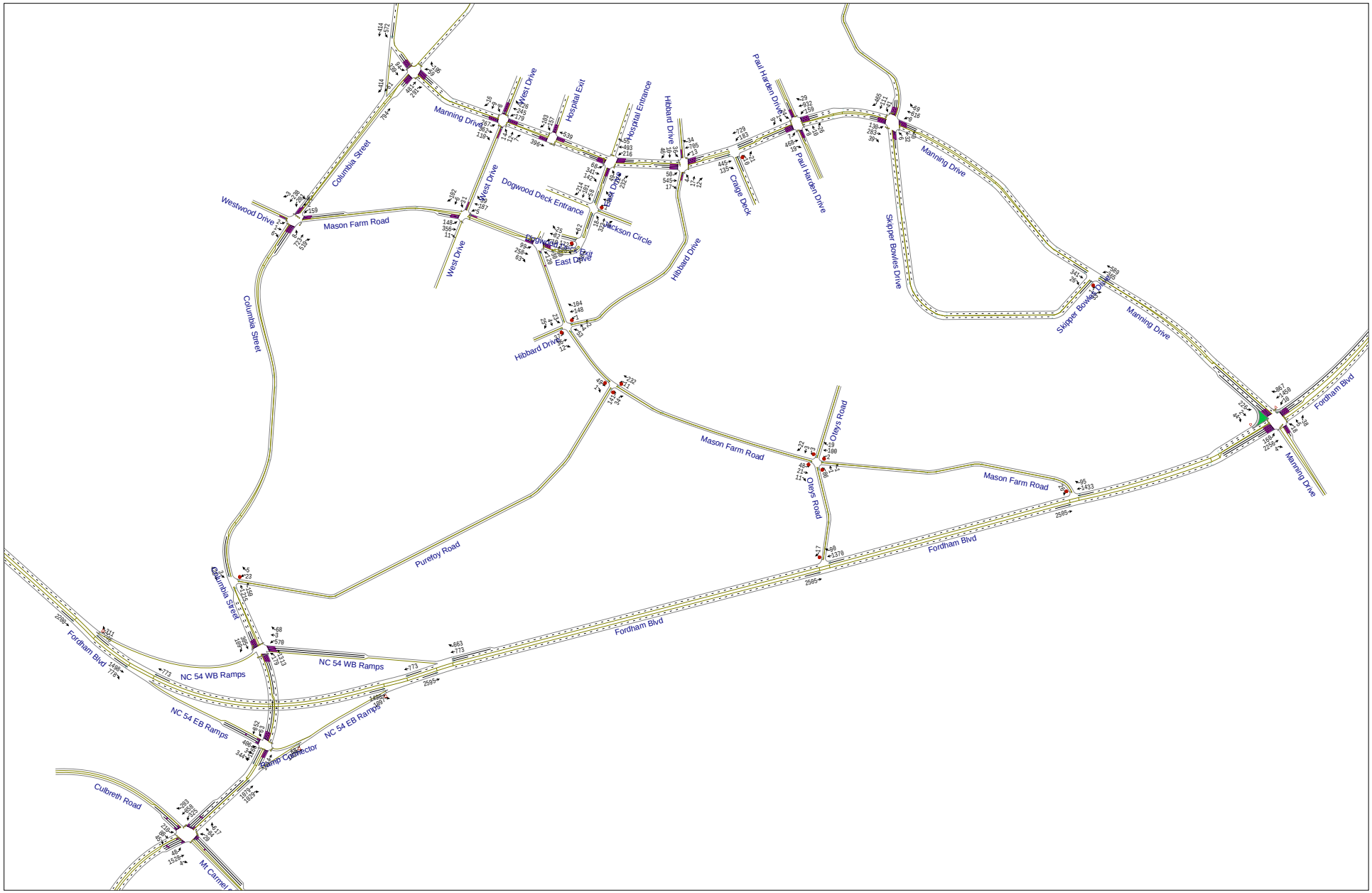


Figure 4-10b
Future Build Year 2030 A.M. Peak Hour Turning Movement Volumes

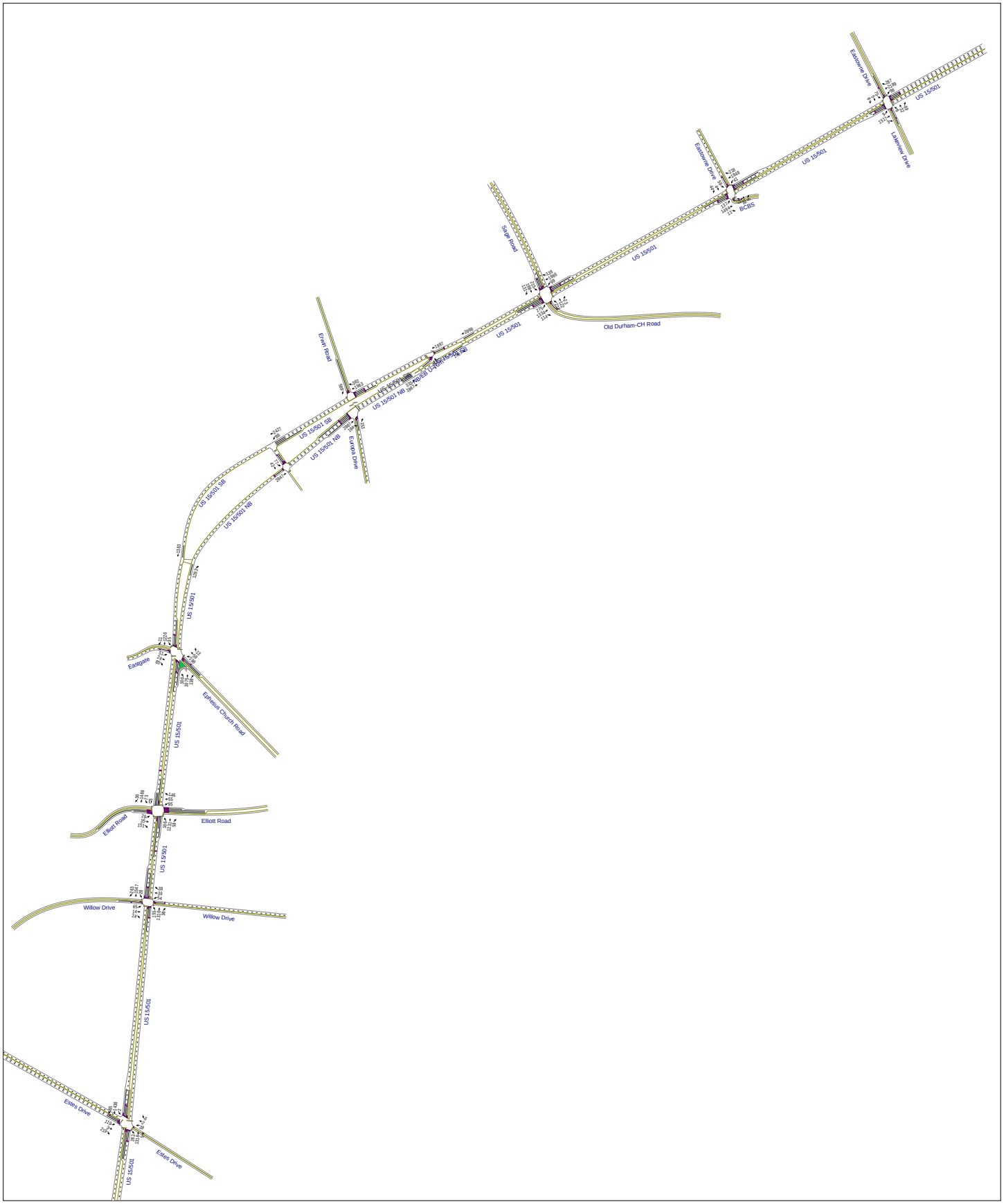


Figure 4-10c
Future Build Year 2030 A.M. Peak Hour Turning Movement Volumes

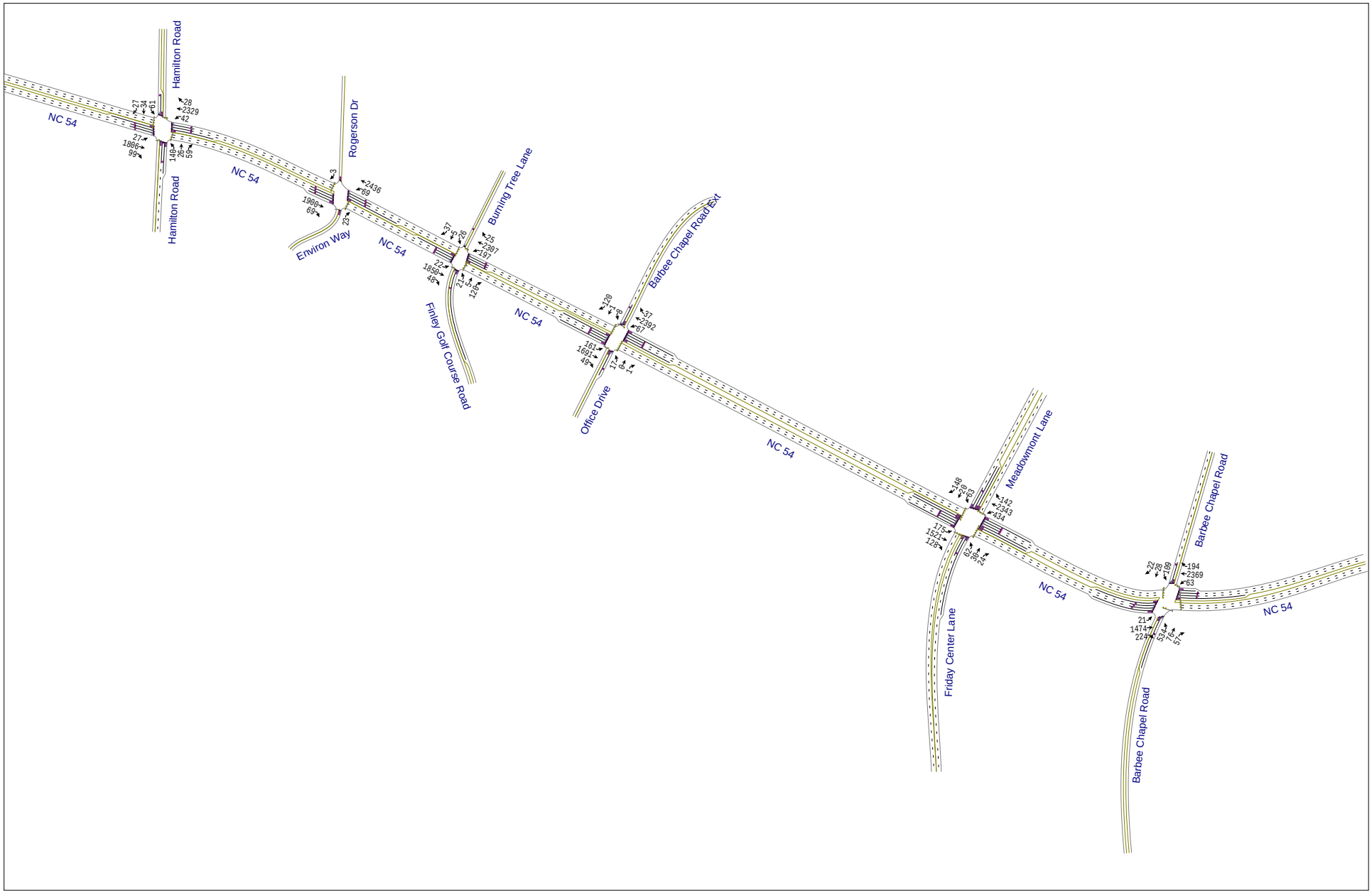


Figure 4-10d
Future Build Year 2030 A.M. Peak Hour Turning Movement Volumes

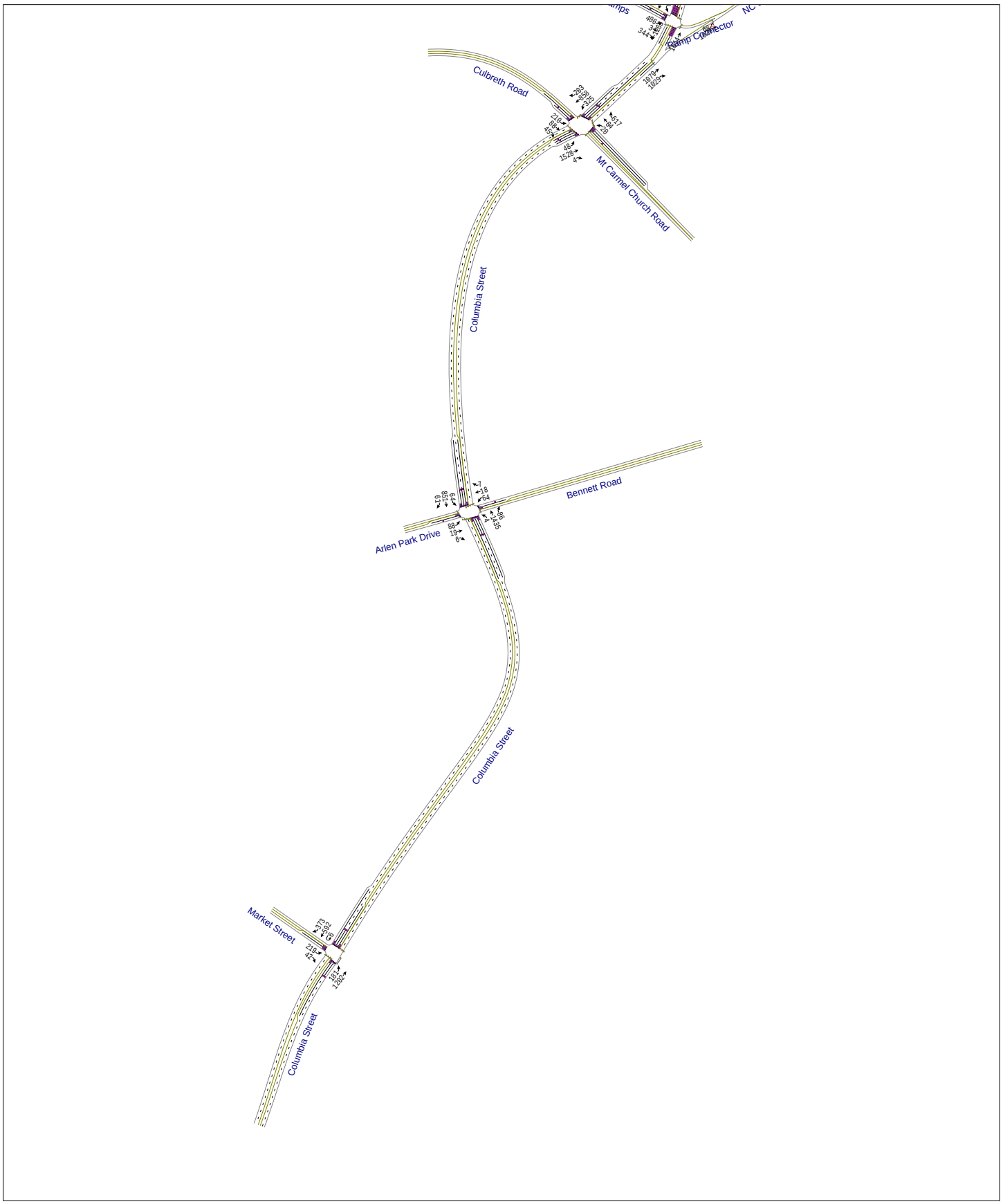


Figure 4-10e
Future Build Year 2030 A.M. Peak Hour Turning Movement Volumes

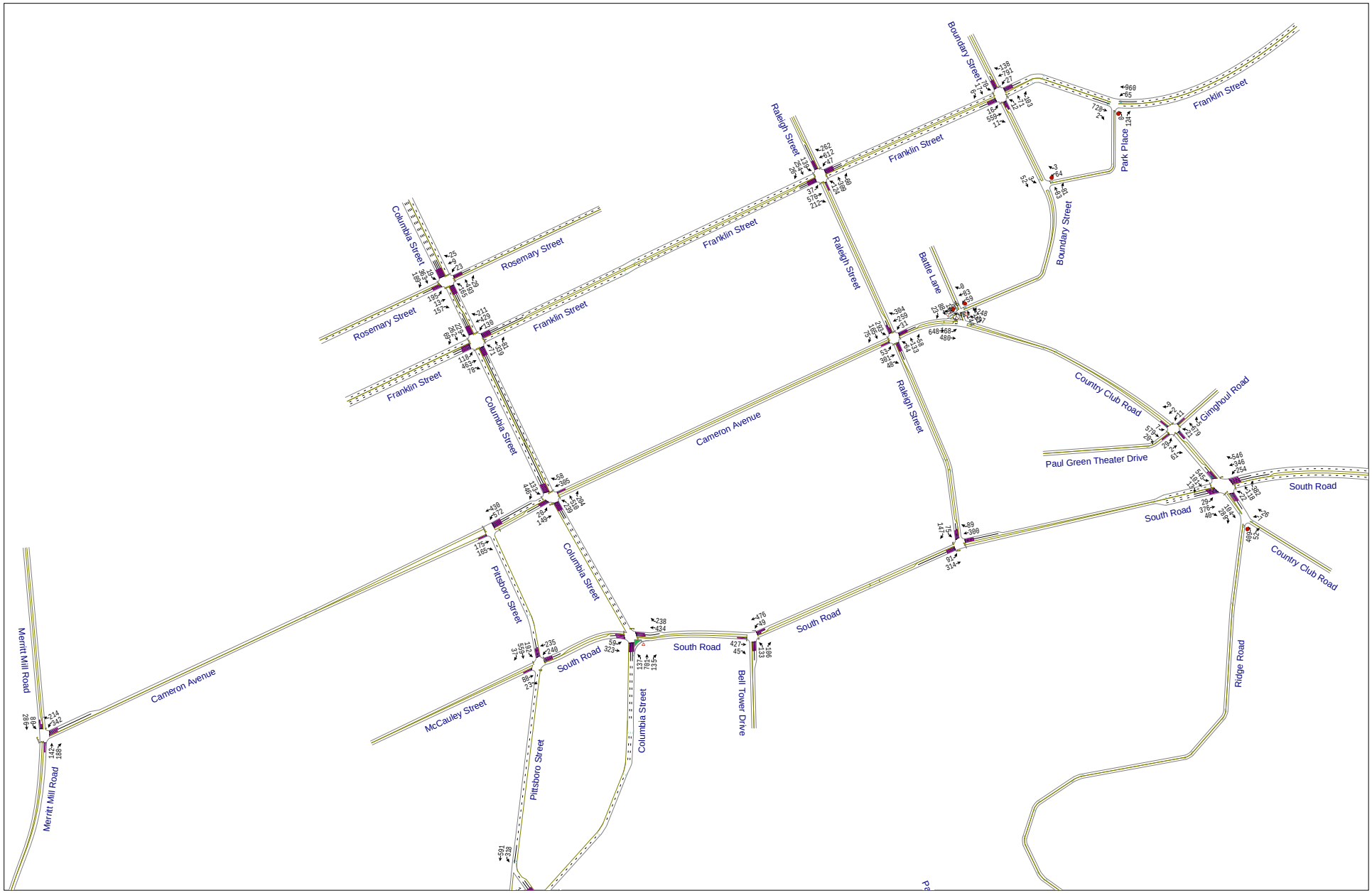


Figure 4-11a
Future Build Year 2030 P.M. Peak Hour Turning Movement Volumes

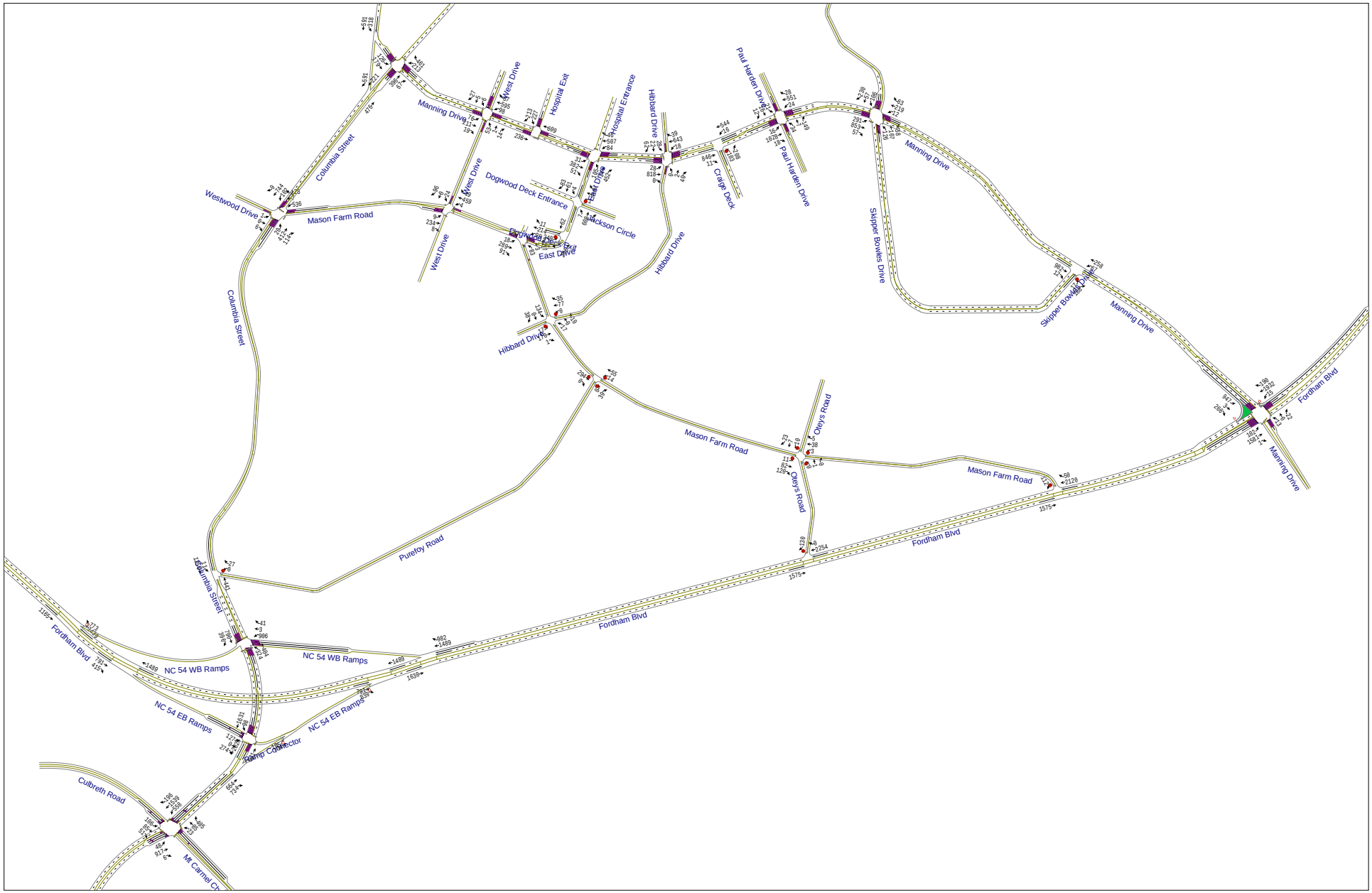


Figure 4-11b
Future Build Year 2030 P.M. Peak Hour Turning Movement Volumes

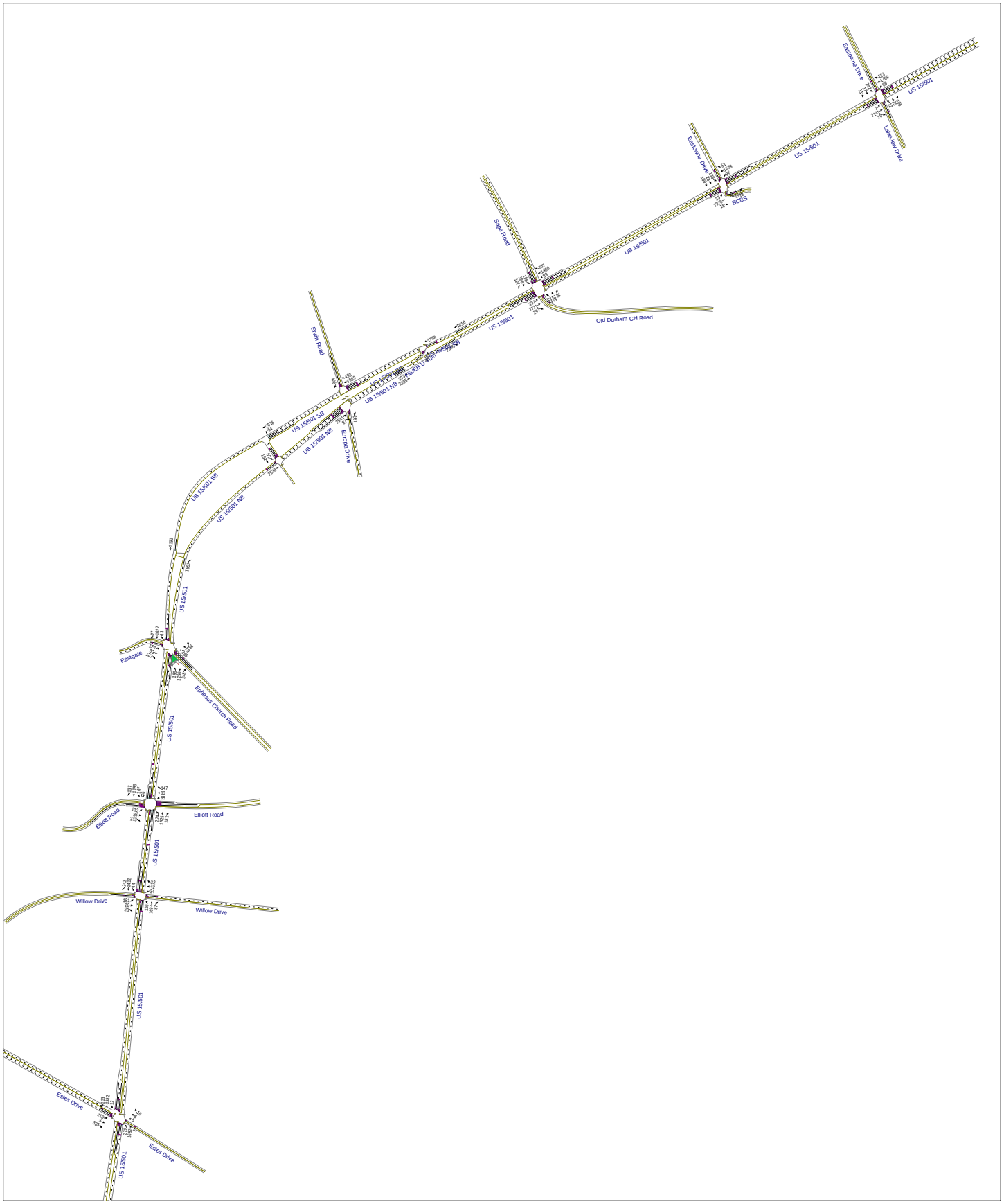


Figure 4-11c
Future Build Year 2030 P.M. Peak Hour Turning Movement Volumes

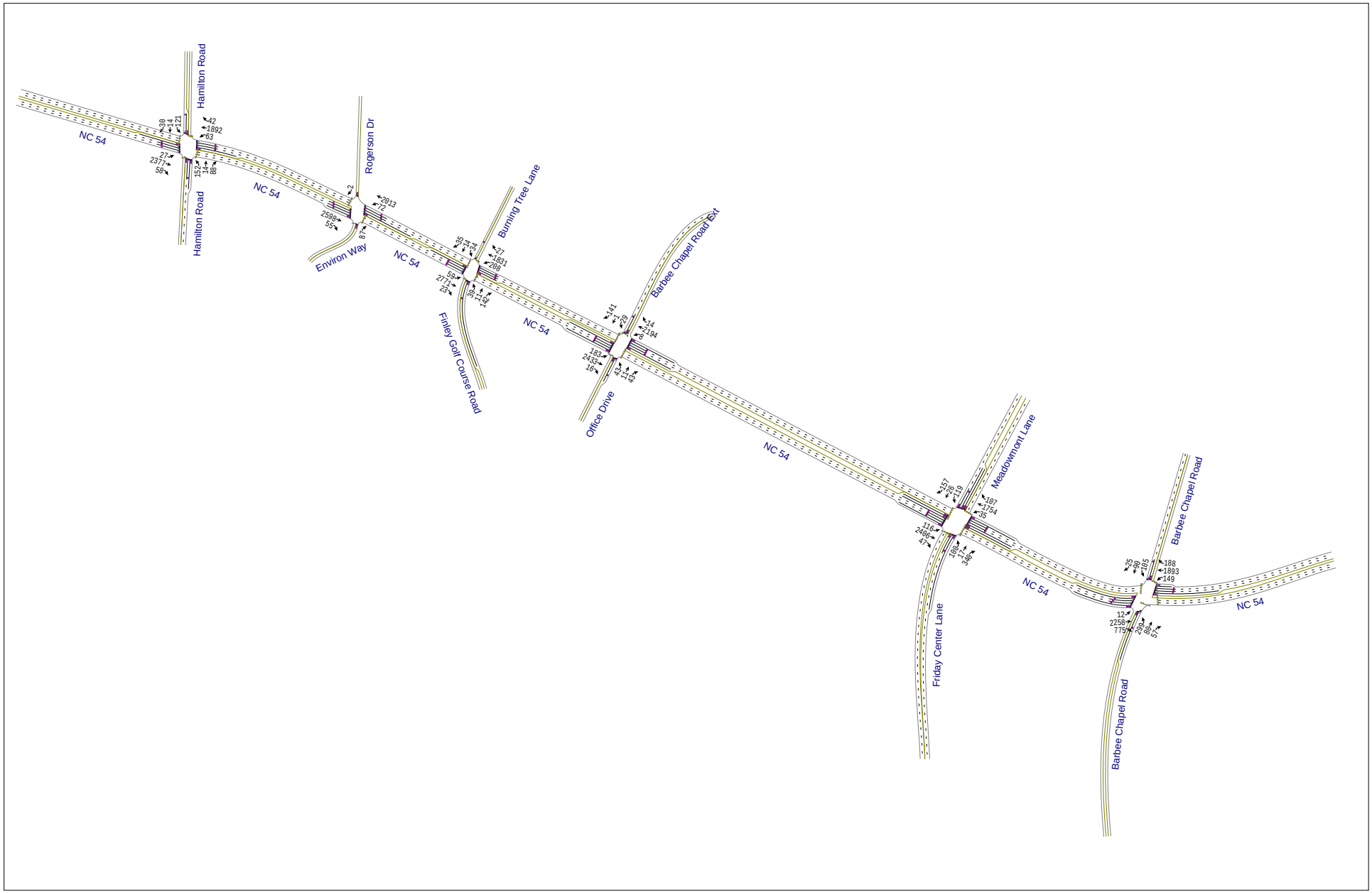


Figure 4-11d
Future Build Year 2030 P.M. Peak Hour Turning Movement Volumes

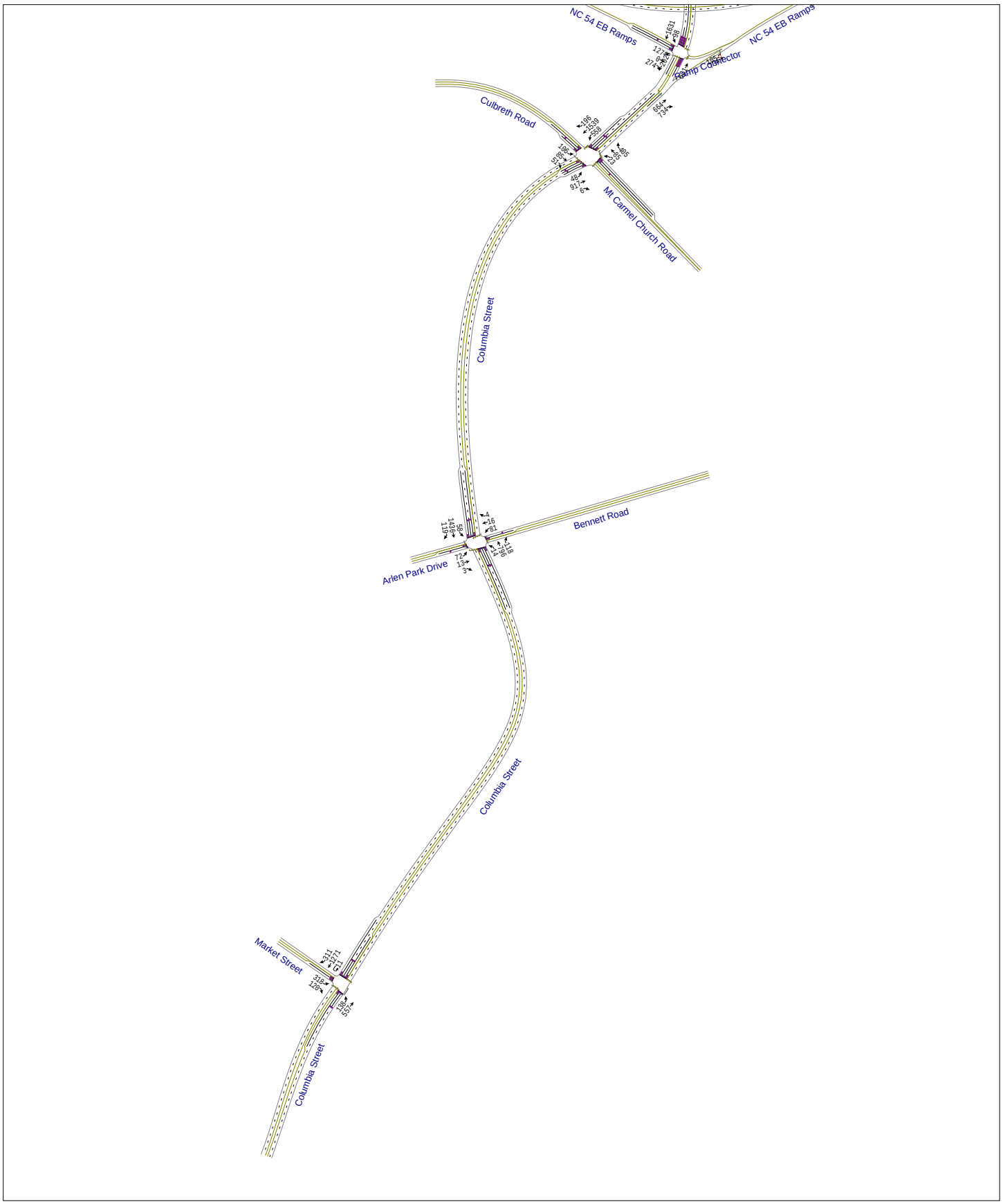


Figure 4-11e
Future Build Year 2030 P.M. Peak Hour Turning Movement Volumes

4.6 FUTURE INTERSECTION LEVEL OF SERVICE ANALYSIS

AM and PM peak hour capacity analyses were performed for the No-Build (2030) and Build (2030) conditions. Per the *Transportation Impact Analysis Guidelines*, all intersections listed in Section 4-3 for which traffic data was available were analyzed for the AM and PM peak hours.

The traffic volumes computed for both scenarios were used to conduct an intersection capacity analysis in the same manner that the existing intersections were examined. The No-Build and Build cases utilized the existing geometrics shown in Figure 4-2. The LOS results are summarized in Table 4-11.

4.6.1 No-Build Analysis Results

As in the Existing Conditions analysis described in Section 4.3, the same intersections that were suffering poor levels of service in 2023 will continue to operate poor levels in 2030 even without any impacts from the Development Plan. Other intersections that were not operating at poor levels in the analysis of existing conditions will deteriorate to poor levels of service in the future as well with the addition of background traffic. In particular, the following intersections were determined to experience a substantial change in LOS (i.e. from acceptable LOS to unacceptable LOS) under No-Build (2030) conditions:

- The intersection of Manning Drive at Fordham Boulevard is currently operating at LOS E in the PM peak hour but is project to operate at LOS F during the PM peak hour in No-Build (2030) scenario.

- The intersection of US 15-501 at Culbreth Road/Mt. Carmel Church Road is currently operating at LOS E during the AM peak hour but is projected to operate at LOS F during the AM peak hour in the No-Build (2030) scenario.

4.6.2 Build Analysis Results

The following intersections were further degraded under Build (2030) conditions:

- The intersection of Cameron Avenue at Columbia Street is expected to operate at LOS E during the AM peak hour and at LOS F during the PM peak hour in the Build (2030) scenario.

- The intersection of County Club Road at Battle Lane is expected to operate at LOS F during the PM Peak hour under the Build (2030) scenario.

Table 4-11: Future No-Build and Build Year 2030 Intersection Levels of Service

ID #	Intersection	Control	No-Build (2030)		Build (2030)	
			AM	PM	AM	PM
1	Columbia Street/Rosemary Street	Signalized	B (WB-C)	B (SB-C)	B (SB-C)	B (SB-C)
2	Columbia Street/Franklin Street	Signalized	C (EB-C)	D (NB-D)	C (NB-D)	D (NB-D)
3	Franklin Street/Raleigh Street	Signalized	B (NB-C)	B (NB-C)	B (NB-B)	B (WB-C)
4	Merritt Mill Road/Cameron Avenue	Signalized	B (WB-B)	B (NB-C)	B (WB-B)	B (NB-C)
5	Cameron Avenue/Pittsboro Street	Signalized	A (EB-C)	B (EB-E)	C (EB-E)	C (EB-E)
6	Cameron Avenue/Columbia Street	Signalized	D (NB-E)	E (WB-F)	E (WB-F)	F (WB-F)
7	Cameron Avenue/Raleigh Street	Signalized	C (SB-C)	C (NB-D)	C (SB-D)	D (NB-E)
8	Pittsboro Street/McCauley Street	Signalized	A (WB-B)	B (WB-B)	B (WB-C)	B (WB-C)
9	Columbia Street/South Road	Signalized	B (EB-C)	B (WB-B)	A (EB-B)	B (WB-B)
10	Raleigh Street/South Road	Signalized	A (SB-B)	A (SB-B)	A (SB-B)	A (SB-C)
11	Country Club Road/South Road	Signalized	C (SB-D)	C (SB-C)	C (SB-D)	C (SB-D)
12	Columbia Street/Manning Drive	Signalized	B (EB-B)	B (EB-B)	B (EB-C)	B (EB-B)
13	Manning Drive/West Drive	Signalized	A (NB-D)	A (NB-C)	A (NB-D)	A (NB-D)
14	Manning Drive/East Drive	Signalized	A (NB-C)	B (NB-C)	A (NB-C)	B (NB-D)
15	Ridge Road/Manning Drive	Signalized	B (NB-C)	C (NB-C)	C (NB-C)	B (NB-D)
16	Mason Farm Road/Columbia Street	Signalized	B (EB-C)	C (WB-D)	B (WB-D)	D (WB-D)
17	Mason Farm Road/West Drive	Signalized	A (SB-B)	A (SB-C)	A (SB-B)	A (SB-B)
18	Mason Farm Road/East Drive	Signalized	B (NB-B)	B (NB-D)	B (NB-C)	B (NB-D)
19	Mason Farm Road/Purefoy Road	Unsignalized	A (EB-A)	A (SB-B)	A (NB-A)	A (SB-A)
20	Manning Drive/Skipper Bowles Drive	Unsignalized	A (NB-B)	A (NB-C)	A (NB-B)	A (NB-C)
21	Columbia Street/Purefoy Road	Unsignalized	A (WB-F)	A (WB-F)	A (WB-F)	A (WB-B)
22	Columbia Street/Fordham Boulevard (northern ramp)	Signalized	C (WB-E)	D (WB-E)	C (WB-E)	D (WB-E)
23	Columbia Street/Fordham Boulevard (southern ramp)	Signalized	B (EB-E)	A (EB-D)	C (EB-E)	A (EB-D)
24	Mason Farm Road/Fordham Boulevard	Unsignalized	A (SB-C)	A (SB-F)	A (SB-C)	A (SB-F)
25	Manning Drive/Fordham Boulevard	Signalized	C (SB-E)	F (WB-F)	C (SB-E)	F (WB-F)
26	Mason Farm Road/Oteys Road	Unsignalized	A (NB-A)	A (EB-A)	A (NB-A)	A (EB-A)
27	Franklin Street/Boundary Street	Signalized	A (SB-C)	A (SB-C)	A (SB-B)	A (SB-C)
28	Franklin Street/Park Place	Unsignalized	A (NB-A)	A (NB-B)	A (NB-A)	A (NB-B)
29	Battle Lane/Boundary Street	Unsignalized	A (WB-A)	A (NB-A)	A (WB-A)	A (NB-B)
30	Country Club Road/Battle Lane	Unsignalized	A (SB-D)	D (SB-F)	A (SB-E)	F (SB-F)
307	Country Club Road & Boundary Street	Unsignalized	A (SB-B)	A (SB-B)	A (SB-B)	A (SB-B)
31	Country Club Road/Gimghoul Road	Signalized	A (WB-D)	A (WB-C)	A (WB-D)	A (WB-D)
32	Manning Drive/Hibbard Drive	Signalized	A (SB-C)	A (SB-C)	A (SB-C)	A (SB-C)
33	Manning Drive/Craige Drive	Signalized	A (SB-D)	A (SB-C)	A (SB-C)	A (SB-D)
34	East Drive/Jackson Circle/Dogwood Deck Entrance	Unsignalized	A (WB-B)	A (WB-B)	A (WB-B)	A (WB-B)
35	East Drive/Dogwood Deck Exit	Unsignalized	A (EB-B)	A (EB-B)	A (EB-B)	A (EB-B)
36	Mason Farm Road/Hibbard Drive	Unsignalized	B (WB-B)	B (EB-C)	B (WB-B)	B (EB-C)
37	South Road/Bell Tower Drive	Signalized	B (NB-C)	B (NB-C)	B (NB-C)	B (NB-C)
38	Manning Drive/Old East Drive	Signalized	A (SB-D)	A (SB-C)	A (SB-C)	B (SB-D)
39	Manning Drive/Craige Deck	Unsignalized	A (NB-C)	A (NB-C)	A (NB-C)	A (NB-E)
101	US 15-501/Estes Drive	Signalized	C (WB-C)	C (WB-E)	C (WB-C)	C (WB-E)
102	US 15-501/Willow Drive	Signalized	B (WB-E)	B (EB-F)	B (WB-E)	C (EB-F)
103	US 15-501/Elliottt Road	Signalized	B (WB-E)	C (EB-E)	B (WB-E)	C (EB-E)
104	US 15-501/Ephesus Church Road	Signalized	C (WB-F)	D (EB-F)	C (WB-F)	D (EB-F)
105	US 15-501/Erwin Road	Signalized	C (SB-F)	B (SB-F)	C (SB-F)	B (SB-F)
106	US 15-501/Europa Drive	Signalized	A (NB-E)	B (NB-F)	A (NB-E)	B (NB-F)
107	US 15-501/Superstreet NB U-Turn	Signalized	B (NB-E)	B (NB-C)	B (NB-E)	B (NB-E)
108	US 15-501/Superstreet SB U-Turn	Signalized	A (SB-E)	B (SB-F)	A (SB-E)	C (SB-F)
109	US 15-501/Sage Road	Signalized	D (NB-F)	E (NB-F)	D (NB-F)	E (NB-F)
110	US 15-501/Eastowne Drive/BCBS	Signalized	B (SB-E)	B (SB-F)	B (SB-E)	B (SB-F)
111	US 15-501/Eastowne Drive/Lakeview Drive	Signalized	B (SB-F)	D (SB-F)	B (SB-F)	D (SB-F)
201	NC 54/Hamilton Street	Signalized	B (NB-D)	B (NB-D)	B (NB-E)	B (NB-D)
202	NC 54/Burning Tree Lane	Signalized	A (SB-D)	B (SB-D)	A (SB-D)	B (SB-D)
203	NC 54/Barbee Chapel Road Ext	Signalized	A (NB-E)	B (NB-E)	A (NB-E)	B (NB-E)
204	NC 54/Meadowmont Lane	Signalized	B (NB-D)	C (NB-E)	B (NB-D)	C (NB-E)
205	NC 54/Barbee Chapel Road (East)	Signalized	D (NB-F)	C (SB-F)	D (NB-F)	C (SB-F)
301	US 15-501/Culbreth Road/Mt Carmel Church Road	Signalized	F (EB-F)	E (EB-F)	F (EB-F)	E (EB-F)
302	US 15-501/Bennett Road/Arlen Park Drive	Signalized	B (EB-F)	B (WB-E)	B (EB-F)	B (WB-E)
303	US 15-501/Market Street	Signalized	B (EB-C)	B (EB-D)	B (EB-D)	B (EB-D)

Legend: X = Overall intersection level of service; (X) = worst movement level of service.

4.7 COMPARISON OF 2019 TIA UPDATE AND 2023 TIA UPDATE

Table 4-12 identifies those intersections where the existing year LOS has degraded compared to the existing year LOS from the 2019 Update during either the AM peak hour or the PM peak hour. Some minor changes in LOS are simply a result of the traffic assignment and simulation programs responding to a change anywhere in the network. Some of the other changes can be contributed to changes in the transportation network such as increases in volume.

Some of the LOS changes have occurred at unsignalized intersections where a poor LOS is expected on the stop-controlled approaches; however, some degradation in LOS is apparent at signalized intersections as well. As noted in previous sections, most intersections are currently operating at LOS D or better and even though some intersections are reporting a worse LOS than in the 2019 Update, most are still reporting acceptable LOS D or better.

Table 4-12: Comparison of 2019 Update and 2023 Update Existing Levels of Service

			2019 Existing		2023 Existing	
ID #	Intersection	Control	AM	PM	AM	PM
3	Franklin Street/Raleigh Street	Signalized	B (NB-C)	B (NB-C)	C (NB-D)	C (NB-C)
5	Cameron Avenue/Pittsboro Street	Signalized	B (EB-B)	A (EB-B)	B (EB-B)	B (EB-B)
18	Mason Farm Road/East Drive	Signalized	B (NB-B)	A (EB-B)	B (NB-B)	B (NB-B)
30	Country Club Road/Battle Lane	Unsignalized	A (SB-D)	B (SB-F)	A (SB-D)	C (SB-F)
36	Mason Farm Road/Hibbard Drive	Unsignalized	A (EB-C)	A (WB-B)	B (WB-B)	B (EB-C)
103	US 15-501/Elliott Road	Signalized	A (EB-E)	B (EB-E)	B (EB-E)	D (EB-E)
105	US 15-501/Erwin Road	Signalized	A (WB-A)	A (WB-A)	C (SB-F)	B (SB-F)
109	US 15-501/Sage Road	Signalized	D (NB-F)	D (NB-F)	D (NB-F)	E (NB-F)
110	US 15-501/Eastowne Drive/BCBS	Signalized	A (SB-D)	B (SB-D)	B (NB-E)	B (SB-E)
301	US 15-501/Culbreth Road/Mt Carmel Church Road	Signalized	D (EB-D)	C (NB-E)	E (EB-F)	E (WB-F)
302	US 15-501/Bennett Road/Arlen Park Drive	Signalized	A (EB-E)	A (EB-E)	B (EB-E)	B (WB-F)

Legend: X = Overall intersection level of service; (XX-X) = worst movement level of service.

4.8 SIGNAL WARRANT ANALYSES

This section provides a signal warrant analysis of three intersections on or near Main Campus that are likely to be impacted by the Development Plan. Intersection level of service analyses were undertaken for these intersections for existing conditions, and year 2030 with and without the Development Plan (No-Build and Build conditions respectively), per the *Transportation Impact Analysis Guidelines*. The following three intersections are now analyzed for potential signalization for the existing (2023) and future (2030) scenarios:

1. Mason Farm Road and Purefoy Road (unsignalized)
2. Mason Farm Road and Oteys Road (unsignalized)
3. Manning Drive and Skipper Bowles Drive (unsignalized)

The following two intersections were assessed for traffic signal warrants in prior updates and modifications to the Development Plan.

1. Mason Farm Road and West Drive – A traffic signal with metal pole and mast arm supports was constructed in the Fall of 2015.

2. Mason Farm Road and East Drive – A design for a new traffic signal with metal poles and mast arm supports has been constructed at this intersection.

Because the traffic signals at the intersections on Mason Farm at West Drive and at East Drive have been implemented, signal warrant analyses were not performed for those intersections for this update of the TIA.

4.8.1 Warrants for Traffic Signalization

The *Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition* recommends the following warrants for installation of a traffic signal:

1. Warrant 1, Eight-Hour Vehicular Volume
2. Warrant 2, Four-Hour Vehicular Volume
3. Warrant 3, Peak Hour Vehicular Volume
4. Warrant 4, Pedestrian Volume
5. Warrant 5, School Crossing
6. Warrant 6, Coordinated Signal System
7. Warrant 7, Crash Experience
8. Warrant 8, Roadway Network
9. Warrant 9, Intersection Near a Grade Crossing

Satisfaction of one or more of the warrants does not in itself justify the installation of a traffic signal. Additional data and study may be necessary to determine the appropriate measure to address a congested or unsafe condition at an unsignalized intersection. As per the *Transportation Impact Analysis Guidelines,* Warrants 1, 2, 3 and 7 were tested for the intersections of Manning Drive at Skipper Bowles Drive, Mason Farm Road at Purefoy Road, and Mason Farm Road at Oteys Road.

As stated in the MUTCD regarding Warrant 1, the Eight-Hour Vehicular Volume Warrant is intended for application either at locations “where a large volume of intersection traffic is the principal reason to consider installing a traffic control signal” or locations “where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.”

For Warrant 2, “The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal.”

For Warrant 3, “The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street.”

For Warrant 7, “The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.”

4.8.2 Existing Conditions Signal Warrant Analysis Results

Signal warrant analyses were performed for existing conditions at the subject intersections utilizing data collected and summarized in Section 4.3. A reduction of right-turning vehicles as recommended by the MUTCD was applied for the northbound right-turn at

Manning Drive and Skipper Bowles Drive due to the exclusive right-turn lane at the intersection. The results of the existing warrant analysis are presented in Table 4-13.

For Warrant 7, the accident reports for the three subject intersections were obtained from NCDOT for a five-year period from October 1, 2018 through September 30, 2023.

Table 4-13: Existing (2023) Conditions Signal Warrant Analysis

Intersection	Eight-Hour Volume Warrant Satisfied? (Warrant 1)	Four-Hour Volume Warrant Satisfied? (Warrant 2)	Peak Hour Volume Warrant Satisfied? (Warrant 3)	Crash Experience Warrant Satisfied? (Warrant 7)
1. Mason Farm Road at Purefoy Road	No	No	AM – No PM - No	No
2. Mason Farm Road at Oteys Road	No	No	AM – No PM - No	No
3. Manning Drive at Skipper Bowles Drive	No	No	AM – No PM – No	No

The intersections of Mason Farm Road at Purefoy Road, Mason Farm Road at Oteys Road do not meet the requirements for Warrants 1-3. Additionally, there were no crashes recorded at the intersection of Mason Farm Road at Oteys Road during the study period for consideration in Warrant 7. There was one (1) property damage only crash recorded at the intersection of Mason Farm Road at Purefoy Road during the study period.

The intersection of Manning Drive and Skipper Bowles Drive does not meet the requirements for Warrants 1-3. Ten (10) or ninety-two percent (92%) of the crashes recorded at this location were property damage only crashes. Class C severity accounted for zero (0) of the total crashes and Class B severity accounted for one (1) or eight percent (8%) of the crashes. No fatal crashes or Class A severity crashes were recorded at this location during the study period. One pedestrian crash did take place near the intersection in September 2022.

Turn restrictions, placed at the intersection during the peak hours, have been suggested for the intersection of Manning Drive and Skipper Bowles Drive in past reports. However, turn restrictions should not impact special event traffic utilizing Skipper Bowles Drive, i.e. concrete median. Any turn restrictions should be accomplished through signing or striping. No daily peak period turn restrictions have been implemented at this intersection.

4.8.3 Future Conditions Signal Warrant Analysis

Signal warrant analyses were performed for future conditions at the subject intersections utilizing the projected volumes summarized in Section 4.5. Under future conditions, Warrants 1, 2, 3 and 7 were tested for the intersections of Manning Drive at Skipper Bowles Drive, Mason Farm Road at Purefoy Road, and Mason Farm Road at Oteys Road.

The results of the analysis are summarized in Table 4-14. As in the existing year analysis, none of the studied intersections meet Warrants 1-3 for signalization given the projected future year volumes.

Table 4-14: Future (2030) Conditions Signal Warrant Analysis

Intersection	Eight-Hour Volume Warrant Satisfied? (Warrant 1)	Four-Hour Volume Warrant Satisfied? (Warrant 2)	Peak Hour Volume Warrant Satisfied? (Warrant 3)
1. Mason Farm Road at Purefoy Road	No	No	AM – No PM - No
2. Mason Farm Road at Oteys Road	No	No	AM – No PM – No
3. Manning Drive at Skipper Bowles Drive	No	No	AM – No PM - No

4.9 MITIGATION STRATEGIES

4.9.1 Planned Intersection Improvements

The intersection improvements previously suggested by the University and approved and/or stipulated by the Town are discussed below. Some have been implemented while some others have not. The improvements include geometric improvements and signal timing and phasing modifications at some intersections. Optimized timings are included in the Appendix.

South Columbia Street/South Road/McCauley Street

The radius of the northbound right-turn lane at this intersection has been reduced as recommended in earlier Development Plan Updates. A smaller island has been provided to provide refuge for pedestrians crossing South Columbia Street and South Road. The existing median island on South Road remained in place.

Following the submittal of the February 2006 Update, the Town requested that the eastbound approach of McCauley Street at the intersection with S. Columbia Street be upgraded to include an exclusive left-turn lane. The requested improvement has been accomplished through pavement marking changes. The roadway was not widened, and the eastbound and westbound approaches continue to operate on split phasing.

These improvements are complete. A new traffic signal controller and traffic signal controller cabinet were installed, and the new signal is in operation.

South Road/Country Club Road

An analysis of this intersection with future traffic volumes identified the long-term need for improvements. The stipulations associated with Modification No.1 required the addition of the northbound right-turn lane (which could be accomplished without widening the road) and converting a southbound shared through-right lane to a shared left-though-right lane (again, no widening was required). These improvements have been implemented.

An additional improvement recommended for this area was the realignment of the junction of Ridge Road and Country Club Road to give priority to Ridge Road since this is the major movement. This is particularly important since the construction of the Rams Head deck and can be achieved by eliminating a small number of parking spaces on the west side of the intersection. The northwest corner of this intersection was altered by removing the curb extension, but the intersection remains with stop control on the approach of Ridge Road.

Cameron Avenue/Raleigh Street
Signal phasing improvements were desirable at this intersection to improve the level of service in the PM peak hour (permitted/protected phasing for the left turns). This improvement has been completed. New traffic signal heads, controller, controller cabinet, and audible, countdown pedestrian signals were installed.

Country Club Road/Battle Lane/Boundary Street
The stipulations associated with Modification No.1 of the University Development Plan required a study of this intersection to identify feasible improvements to traffic safety and operations. Signalization and a roundabout were among the measures studied, but it was agreed to upgrade the Country Club Road/Gimghoul Road intersection instead. Bollards and chains were strategically provided at the intersection of Country Club Road, Battle Lane, and Boundary Street to control pedestrians in and around this intersection.

The LOS results indicate that the intersections are operating at acceptable levels now, but the intersection of Country Club Road and Battle Lane is projected to deteriorate to LOS D by the year 2026. The southbound, stop-controlled approach along Battle Lane at Country Club Road is projected to operate at LOS F in year 2030 as is typical at most unsignalized intersections. While multiple stop-controlled approaches in this area are expected to experience increasing delays, the overall levels of service are projected to remain at acceptable levels.

The improvements that have been implemented at this intersection as a result of the study that was performed during Modification No. 1 (marked crosswalks, improved pavement markings, and bollards with chains) have reportedly been successful treatments. At this time, the University is not recommending any further study or the implementation of additional improvements at this intersection but will continue to monitor this intersection and to coordinate with the Town of Chapel Hill on how to address concerns that may be presented at this intersection.

Country Club Road/Gimghoul Road/Paul Green Theater Drive
The stipulations associated with Modification No.1 required a new traffic signal to be implemented at this intersection. This improvement is complete. A new traffic signal with decorative poles and mast arms was installed. The poles and mast arms were colored dark green and the signal heads were colored black. In addition, stamped asphalt crosswalks were installed to simulate a brick pattern. Audible, countdown pedestrian signal heads were also provided.

Manning Drive/Skipper Bowles Drive
Turn restrictions have been implemented to prevent eastbound left-turns from Skipper Bowles Drive onto northbound Manning Drive during special events.

Pittsboro Street/McCauley Street
One of the stipulations that was associated with the University development plan included replacing the traffic signal heads at the intersection of Pittsboro Street and McCauley Street. The existing traffic signal heads has only 8” incandescent displays; the stipulation specifies for the heads to be upgraded to traffic signal heads with 12” LED displays.

As part of the efforts to replace the traffic signal heads in 2011, staff of VHB Engineering NC, P.C., measured vertical clearances between the traffic signal heads and the road surface, the clearances between the traffic signal wires and the utilities on the existing

wood poles, and the available space at the top of the existing wood poles above the current attachment points of the traffic signal cables and the utilities. It was evident that the existing traffic signal heads did not provide the minimum vertical clearances to satisfy requirements of NCDOT; therefore, replacing the existing heads with new traffic signal heads featuring 12" displays would even further violate the minimum vertical clearance requirement. In 2011 staff of the Town of Chapel Hill and NCDOT indicated they would require that the minimum vertical clearances be provided with the replacement of the signal heads.

Since publication of the 2013 TIA Update, University staff have coordinated with staff of the Town of Chapel Hill to eliminate the stipulation requiring that the University upgrade the traffic signal heads at the intersection of Pittsboro Street at McCauley Street to 12" LED displays. It is not anticipated that any further action will be necessary for this formerly stipulated improvement.

4.9.2 Suggested Intersection Improvements

Some intersection improvements were previously suggested by the University. Some have been approved for implementation, some have been implemented, while others are still under consideration. Those improvements are discussed below.

Manning Drive/Ridge Road

Manning Drive is a major access street into Main Campus and is the main access to the UNC Hospitals. Manning Drive is a wide four-lane street, expanding to five lanes at major intersections and driveways. It has the character of a suburban arterial road rather than an urban street. While the speed limit is posted at 25 MPH, the appearance and design of Manning Drive encourages speeding. The high volume of traffic, in conjunction with speeding, poses a major safety hazard to the many pedestrians who cross the street in the vicinity of the student housing towers and the Hospital areas. Pedestrian safety and aesthetic improvements in the vicinity of Ridge Road (the student housing area) are very desirable in the near term. Measures to reduce and calm traffic and improve the appearance of Manning Drive are being studied. This could include adding a median on Manning Drive through this area. This suggested improvement has not been designed or implemented.

Mason Farm Road/East Drive

Prior studies suggested that the unsignalized intersection of Mason Farm Road at East Drive may have needed signalization (although the Master Plan includes changes to the road network in this area). Plans for the design of a new traffic signal at this intersection have been completed and the traffic signal has been constructed. The traffic signal includes metal poles and mast arms, audible countdown pedestrian signals, and push-buttons. The metal poles, mast arms, and push-button housing are colored dark green and the housing for all signal heads are black.

Mason Farm Road/West Drive

Again, prior studies and field observations indicated that this intersection may have needed signalization. A traffic signal was installed at this location utilizing wood poles and messenger cable supports. The wood pole supported signal remained in operation for the duration of the construction of the Marsico Hall (formerly Imaging Research Building) on the adjacent corner of the intersection. The construction of Marsico Hall is complete and the wood pole supported traffic signal has been replaced with a new traffic signal including metal poles and mast arm supports. The new traffic signal includes metal poles and mast

arms, audible countdown pedestrian signals, and push-buttons. The metal poles, mast arms, and push-button housing are colored dark green, and all signal heads are colored black.

4.9.3 Planned Mid-Block Improvements

A number of mid-block improvements were previously identified by the University and were approved for implementation. Some of those improvements have been implemented, while others are yet to be implemented.

South Columbia Street between Manning Drive and South Road

Modifications to South Columbia Street between Manning Drive and South Road were recommended to improve safety for cyclists and pedestrians. This section of South Columbia Street was one-way northbound with four traffic lanes, though the eastern curb lane was almost exclusively used by buses in the peak times. Preliminary 2025 traffic projections indicated that two lanes with a bus lane should result in acceptable traffic conditions.

There was a desire to narrow the pavement through this area as it represents a barrier between the Health Science buildings on the two sides of South Columbia Street. The number of lanes may have also encouraged motorists to travel at speeds in excess of the 25 MPH speed limit. Pedestrian flows across the street are high, and safety was a concern even with the signalized pedestrian crossing in front of the Health Sciences Library. South Columbia Street directly north of the Manning Drive intersection had additional width on the west side which could also be narrowed by extending the curb out to achieve a symmetrical section. This improvement has been completed and consisted of the following:

- Removal a travel lane resulting in the following cross-section: two general traffic lanes, a dedicated bike lane, and a dedicated bus lane on the east side;
- Extending the western curb to the east to narrow the pavement;
- Eliminating the excess pavement in the northwest corner of the intersection of South Columbia Street and Manning Drive, and
- Construction of a new traffic signal at the intersection of South Columbia Street at Medical Drive. The signal is pedestrian activated, i.e. the traffic signal remains green for the South Columbia Street vehicular traffic until a pedestrian wishing to cross South Columbia Street presses the push-button. The westbound approach of Medical Drive remains stop-controlled.

4.9.4 Suggested Mid-Block Improvements

Some mid-block improvements were suggested previously by the University but have not yet been approved for implementation by the Town. Those improvements are discussed below.

Ridge Road

Ridge Road is an important north-south connection on Campus. It is the only significant north-south route aside from the one-way pair of S. Columbia Street and Pittsboro Street. In the peak periods Ridge Road is used by employees in the South Campus area as an

alternate route to using Fordham Boulevard to travel between NC 54 from the east and the Hospitals area.

The most significant safety problem is created by the sharp curve near the drive by the practice field. For a 20 MPH design speed, cars turning left or right out of the drive need 230 feet sight distance to see approaching vehicles. Cars turning left out of the drive need 210 feet to clear approaching vehicles from the left.

The sight line out of the drive is now restricted by cars parking on the right side of the drive and by cars parking on the north side of Ridge Road on both sides of the drive. There is also a sign on the left side of the drive, which interferes with the left view.

The following improvements were recommended in previous updates to this TIA and have been implemented:

- Remove the last parking space on the right side of the drive at Ridge Road.
- Remove the last two parking spaces in the curve on the left (north side) Ridge Road approach to the drive.
- Remove the parking spaces between the gate to the Hockey field and the drive on the north side of Ridge Road.
- Move the sign 20 feet back from Ridge Road.

Pedestrian facility improvements were implemented on Ridge Road between Boshamer Stadium and Henry Stadium as part of the Boshamer Stadium improvements. Other facility improvements for pedestrians and bicycles are currently under study.

The Rams Head deck included a northbound left-turn lane on Ridge Road at the main entrance to the deck. In addition, a speed table/raised crosswalk was constructed on Ridge Road north of the deck entrances and south of the intersection with Stadium Drive.

4.10 TRAFFIC CALMING MEASURES AND PEDESTRIAN MEASURES

This section discusses improvements that are planned or have been completed to calm traffic or to improve pedestrian facilities on Campus.

Traffic calming measures are intended to slow vehicular traffic and enhance the safety of pedestrians. Calming measures can include devices such as medians, speed tables/bumps, or traffic/pedestrian signals. Other calming measures include intersection and mid-block stop signs, enhanced pedestrian crosswalk striping, or the elimination of turning lanes to reduce pavement width for crossing pedestrians. Figure 4-12 shows existing and proposed traffic calming measures, and planned pedestrian enhancements, for Main Campus. Some of these proposed measures are long term that may extend beyond the Development Plan period.

Not only has the University agreed to provide traffic calming measures on campus, but the University agreed to provide traffic calming measures on streets in neighborhoods immediately adjacent to Campus. As part of the 2006 update, the University coordinated with the traffic engineering staff of the Town of Chapel Hill to identify streets in neighborhoods adjacent to Campus for consideration of implementing traffic calming devices and to identify type and location of appropriate traffic control measures.

The traffic calming devices listed below are the types of devices that were considered appropriate for review for implementation on neighboring streets:

- All-way stops at intersections
- Speed tables
- Speed humps
- Pavement markings

Table 4-15 identifies which streets were considered and which streets were recommended for further consideration for the implementation of traffic calming devices. These recommendations remain unchanged from the February 2006 TIA Update. The University designed and implemented the traffic calming plans at no cost to the Town of Chapel Hill. The Town of Chapel Hill has been responsible for maintaining the traffic calming devices on Town streets after implementation was completed.

All of the traffic calming measures identified in Table 4-15 have been implemented.

For the 2011 TIA update, the Town of Chapel Hill requested additional traffic data be collected on some of the streets where the University previously designed and implemented traffic calming devices. Daily traffic volumes and vehicle speed data were collected at the following locations:

- Ransom Street south of McCauley Street
- Ransom Street south of Vance Street
- McCauley Street west of Brookside Drive

These locations were specified in the fall of 2011 by staff of the Town of Chapel Hill during a field meeting with staff of VHB. The daily traffic volume and speed data were provided to the staff of the Town of Chapel Hill as part of the submission of the 2011 TIA update.

During preliminary discussions with Town staff to prepare for the 2017 TIA update, staff of the Town of Chapel Hill requested that the University gather new traffic and volume data at the same locations noted above. The new data was gathered during the Fall of 2017 and has been provided to the Town of Chapel Hill as part of the submission of the 2017 Development Plan TIA Update.

Following the 2009 TIA update, the University designed and implemented an in-pavement warning light system for a mid-block pedestrian crosswalk on Mason Farm Road between West Drive and South Columbia Street. The system was implemented as part of the construction of the Marsico Hall Building with the support and approval of the Town of Chapel Hill and has been maintained by the Town of Chapel Hill. When activated, the warning light system alerts approaching drivers that pedestrians are in or are approaching the crosswalk. The system initially included push-button activation of the warning light and bollards equipped with sensors to detect pedestrians approaching the crosswalk were installed as part of the completed construction of the Marsico Hall Building in 2016. Staff observed that as of November 2017, the warning light system has been disabled.

The following pedestrian facility improvements, not all shown on Figure 4-12, have also been provided:

- Bell Tower area – New campus open space and pedestrian circulation system were constructed throughout what was previously a parking lot, including ADA accessible sidewalks, pedestrian bridge between the new parking deck and Medical Drive, and landscaping. New walks, and steps were also constructed to connect the Genome Science building with the NC Area Health Education Center, and Fordham Hall, and Medical Drive. New walks and steps were constructed to connect to Taylor Student Health.
- Dental School – New sidewalks were constructed, with establishment of a pedestrian safety zone between the street and the sidewalk along South Columbia Street between the Health Sciences Library and Manning Drive. The improvement extends along Manning Drive to a new patient drop-off on Manning drive and includes a new pedestrian bridge across Manning Drive and landscaping.
- Kenan Stadium – A new fire lane/brick sidewalk access between Stadium Drive and the northwest entry to Kenan Stadium has been constructed.
- New sidewalk on north side of Kenan Stadium connecting the east/west sidewalk along Stadium Drive to the east/west sidewalk on the north side of the stadium has been constructed.
- New sidewalk and steps in the Geology Department Wheeler Memorial Garden that connects Wilson and Mitchell Hall have been constructed
- A newly improved pedestrian circulation system between Stadium Drive and South Road between Fetzer Gymnasium and Woollen Gymnasium has been constructed.

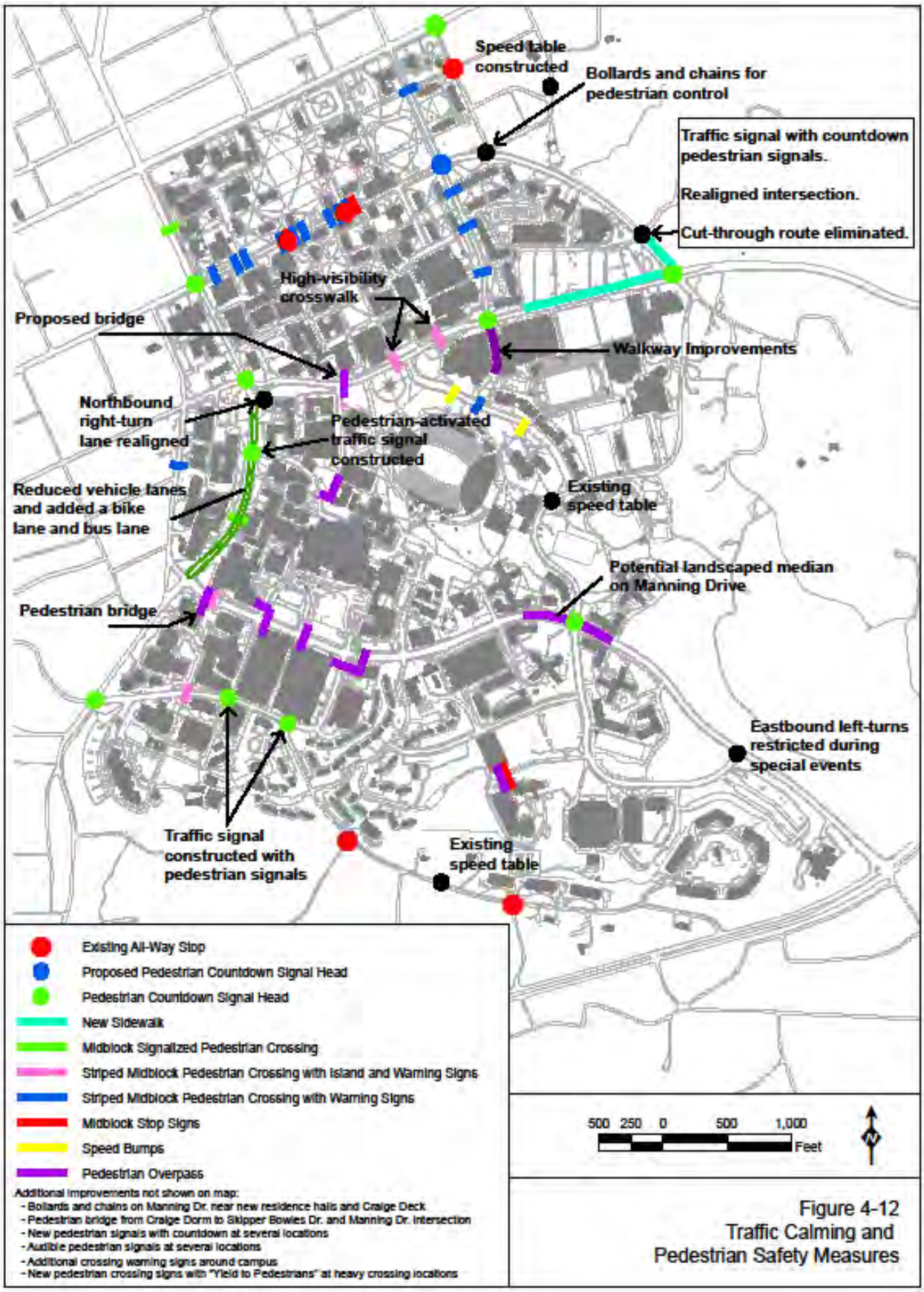


Figure 4-12
Traffic Calming and
Pedestrian Safety Measures

Table 4-15: Neighborhood Streets Considered for Traffic Calming Devices

Street	Identified for Implementation?	Traffic Calming Measures	
		Status	Element
Westwood Drive, Ransom Street, McCauley Street, and Vance Street	No. Traffic calming measures have already been implemented.	Complete	All-way stops Improved pavement markings Speed tables
Oteys Road	No. Traffic calming measures have already been implemented.	Complete	Speed table
Purefoy Road	No. Traffic calming measures have already been implemented.	Complete	Speed tables and all-way stops
Mason Farm Road	No. Traffic calming measures have already been implemented.	N/A	N/A
Ridge Road	No. Traffic calming measures have already been implemented.	N/A	N/A
Laurel Hill Road	No. Alignment and cross-section of road is already a calming measure prohibiting high travel speeds and creating longer travel times than competing routes.	N/A	N/A
Gimghoul Road	No. Church property was sold and will be redeveloped as residential units. As a result, the cut-through route connecting to South Road (NC 54) was eliminated. The intersection of Gimghoul Road and Country Club Road has been signalized. Paul Green Theater Drive was relocated to align with Gimghoul Road.	Complete	New traffic signal Decreased corner radii at intersection with Country Club Road Stamped asphalt crosswalks Audible, countdown pedestrian signals
Raleigh Street	No. Traffic calming measures have already been implemented.	N/A	N/A
Cameron Avenue	No. Traffic calming measures have already been implemented.	N/A	N/A
Battle Lane	No. Traffic calming measures have already been implemented.	N/A	N/A
Boundary Street	Yes. Plans were completed and submitted to Town for implementation.	Complete	Speed table
Park Place	No. Traffic calming devices were deemed not feasible on this street.	N/A	N/A

APPENDIX

INTERSECTION LEVEL OF SERVICE WORKSHEETS
EXISTING (2023) AM

UNC DP TIA 2023 — Existing (2023) AM
1: Columbia Street & Rosemary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	1	73	17	5	6	77	311	31	23	430	100
Future Volume (vph)	93	1	73	17	5	6	77	311	31	23	430	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	0		0	0		0	125		0	0		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			50			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.97	0.97		0.99	0.98		0.95	0.98		0.91		0.86
Frt		0.852			0.919			0.987				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1433	1391	0	1486	1409	0	1433	2885	0	1433	2867	1378
Flt Permitted	0.749			0.704			0.438			0.501		
Satd. Flow (perm)	1101	1391	0	1090	1409	0	628	2885	0	688	2867	1184
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		81			7			10				111
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		783			945			370			503	
Travel Time (s)		21.4			25.8			10.1			13.7	
Confl. Peds. (#/hr)	19		8	8		19	32		49	49		32
Confl. Bikes (#/hr)			5									4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	103	1	81	19	6	7	86	346	34	26	478	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	82	0	19	13	0	86	380	0	26	478	111
Turn Type	D.P+P	NA		D.Pm	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		4	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.8	31.0		31.0	32.0		12.8	22.8		12.1	21.8	12.8
Total Split (s)	19.0	51.0		51.0	32.0		17.0	54.0		15.0	52.0	19.0
Total Split (%)	15.8%	42.5%		42.5%	26.7%		14.2%	45.0%		12.5%	43.3%	15.8%
Maximum Green (s)	13.2	45.0		45.0	26.0		11.2	48.2		9.9	46.2	13.2
Yellow Time (s)	3.0	3.2		3.2	3.2		3.0	3.3		3.0	3.3	3.0
All-Red Time (s)	2.8	2.8		2.8	2.8		2.8	2.5		2.1	2.5	2.8
Lost Time Adjust (s)	-0.8	-0.8		-1.0	-1.0		-0.8	-0.8		0.1	0.1	-0.8
Total Lost Time (s)	5.0	5.2		5.0	5.0		5.0	5.0		5.2	5.9	5.0
Lead/Lag	Lead				Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Recall Mode	None	Ped		Ped	Ped		None	C-Max		None	C-Max	None
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)		18.0		18.0	19.0			10.0			9.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	37.5	42.3		42.5	27.0		63.5	60.2		64.1	55.5	66.9
Actuated g/C Ratio	0.31	0.35		0.35	0.22		0.53	0.50		0.53	0.46	0.56

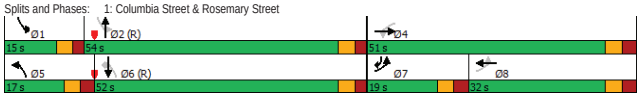
UNC DP TIA 2023 — Existing (2023) AM
1: Columbia Street & Rosemary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.28	0.15		0.05	0.04		0.22	0.26		0.06	0.36	0.15
Control Delay	28.6	6.1		24.8	25.4		11.8	13.2		13.2	23.2	2.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	28.6	6.1		24.8	25.4		11.8	13.2		13.2	23.2	2.7
LOS	C	A		C	C		B	B		B	C	A
Approach Delay		18.6			25.1			13.0			19.1	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)	55	1		10	4		23	55		9	125	0
Queue Length 95th (ft)	94	33		26	21		45	82		24	187	25
Internal Link Dist (ft)		703			865			290			423	
Turn Bay Length (ft)							125					
Base Capacity (vph)	411	580		417	322		425	1452		438	1326	762
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.25	0.14		0.05	0.04		0.20	0.26		0.06	0.36	0.15

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 90 (75%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 17.0 — Intersection LOS: B
Intersection Capacity Utilization 54.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Columbia Street & Rosemary Street



Existing (2023) AM.syn VHB

UNC DP TIA 2023 — Existing (2023) AM
2: Columbia Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	266	35	72	324	112	31	264	79	93	395	49
Future Volume (vph)	52	266	35	72	324	112	31	264	79	93	395	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	0		0	250		0	600		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.89	0.98		0.92	0.94		0.97	0.94		0.85	0.99	
Frt		0.983			0.962			0.965			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1433	3080	0	1486	2690	0	1433	2693	0	1433	2797	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1272	3080	0	1366	2690	0	1388	2693	0	1215	2797	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			39			32			11	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		795			952			972			370	
Travel Time (s)		21.7			26.0			26.5			10.1	
Confl. Peds. (#/hr)	135		79	79		135	38		158	158		38
Confl. Bikes (#/hr)			1			6			1			4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	58	296	39	80	360	124	34	293	88	103	439	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	335	0	80	484	0	34	381	0	103	493	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.4	28.2		12.9	28.2		12.9	27.9		12.9	27.7	
Total Split (s)	22.0	38.0		22.0	38.0		22.0	38.0		22.0	38.0	
Total Split (%)	18.3%	31.7%		18.3%	31.7%		18.3%	31.7%		18.3%	31.7%	
Maximum Green (s)	16.6	31.8		16.1	31.8		16.1	32.1		16.1	32.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.3		3.0	3.1	
All-Red Time (s)	2.4	3.2		2.9	3.2		2.9	2.6		2.9	2.6	
Lost Time Adjust (s)	-0.4	-1.2		-0.9	-1.2		-0.9	-0.9		-0.9	-0.7	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	Ped		None	Ped	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	9.4	54.8		11.2	56.5		8.6	23.9		12.7	33.2	
Actuated g/C Ratio	0.08	0.46		0.09	0.47		0.07	0.20		0.11	0.28	

Existing (2023) AM.syn VHB

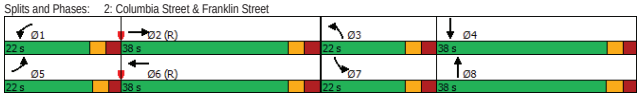
UNC DP TIA 2023 — Existing (2023) AM
2: Columbia Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.52	0.24		0.58	0.38		0.33	0.68		0.68	0.63	
Control Delay	68.8	22.2		68.0	21.8		62.7	22.6		103.7	25.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	68.8	22.2		68.0	21.8		62.7	22.6		103.7	25.6	
LOS	E	C		E	C		E	C		F	C	
Approach Delay		29.1			28.4			25.9			39.1	
Approach LOS		C			C			C			D	
Queue Length 50th (ft)	44	80		61	115		15	140		82	165	
Queue Length 95th (ft)	87	138		110	193		m28	199		145	74	
Internal Link Dist (ft)		715			872			892			290	
Turn Bay Length (ft)				250			600			125		
Base Capacity (vph)	203	1412		210	1286		203	763		203	818	
Starvation Cap Reductn	0	0		0	0		0	0		0	11	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.29	0.24		0.38	0.38		0.17	0.50		0.51	0.61	

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 42 (35%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 31.2 — Intersection LOS: C
Intersection Capacity Utilization 65.0% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Columbia Street & Franklin Street



Existing (2023) AM.syn VHB

UNC DP TIA 2023 — Existing (2023) AM
3: Raleigh Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	294	104	59	399	133	123	179	36	44	291	25
Future Volume (vph)	14	294	104	59	399	133	123	179	36	44	291	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	10	9	10	11	12	12	12	10	10	10
Storage Length (ft)	100		0	100		0	0		0	150		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.98		0.97	0.97			0.99		0.99	1.00	
Frt		0.961			0.962			0.986			0.988	
Flt Protected	0.950			0.950				0.982		0.950		
Satd. Flow (prot)	1433	2691	0	1433	2781	0	0	1616	0	1486	1538	0
Flt Permitted	0.375			0.467				0.631		0.498		
Satd. Flow (perm)	553	2691	0	684	2781	0	0	1031	0	769	1538	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		60			55			11			7	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1179			1100			994			364	
Travel Time (s)		32.2			30.0			27.1			9.9	
Confl. Peds. (#/hr)	19		15	15		19	29		17	17		29
Confl. Bikes (#/hr)			2			7			1			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	16	327	116	66	443	148	137	199	40	49	323	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	443	0	66	591	0	0	376	0	49	351	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		D.Pm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		6	6		7	4		4	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	19.8	19.8		19.8	19.8		8.0	20.0		20.0	20.0	
Total Split (s)	35.0	35.0		35.0	35.0		8.0	55.0		55.0	47.0	
Total Split (%)	38.9%	38.9%		38.9%	38.9%		8.9%	61.1%		61.1%	52.2%	
Maximum Green (s)	30.2	30.2		30.2	30.2		4.0	51.0		51.0	43.0	
Yellow Time (s)	3.3	3.3		3.1	3.1		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.7	1.7		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	-0.1	-0.1		-0.1	-0.1			-0.6		-1.2	-1.2	
Total Lost Time (s)	4.7	4.7		4.7	4.7			3.4		2.8	2.8	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)	4.0	4.0		4.0	4.0			5.0		5.0	5.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)	42.3	42.3		42.3	42.3			39.6		40.2	40.2	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.44		0.45	0.45	

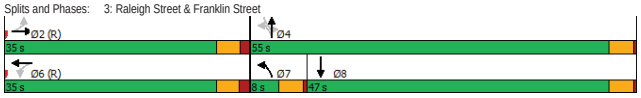
UNC DP TIA 2023 — Existing (2023) AM
3: Raleigh Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.06	0.34		0.21	0.44			0.82		0.14	0.51	
Control Delay	19.1	15.9		20.8	17.8			35.1		12.5	18.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	19.1	15.9		20.8	17.8			35.1		12.5	18.8	
LOS	B	B		C	B			D		B	B	
Approach Delay		16.0			18.1			35.1			18.0	
Approach LOS		B			B			D			B	
Queue Length 50th (ft)	5	70		22	104			173		16	132	
Queue Length 95th (ft)	21	133		63	188			231		28	157	
Internal Link Dist (ft)		1099			1020			914			284	
Turn Bay Length (ft)	100			100						150		
Base Capacity (vph)	260	1297		321	1337			595		446	795	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.06	0.34		0.21	0.44			0.63		0.11	0.44	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 21.0 — Intersection LOS: C
Intersection Capacity Utilization 79.8% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: Raleigh Street & Franklin Street



UNC DP TIA 2023 — Existing (2023) AM
4: Merritt Mill Road & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lane Configurations							
Traffic Volume (vph)	51	35	144	333	134	84	
Future Volume (vph)	51	35	144	333	134	84	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	14	15	15	9	12	
Storage Length (ft)	0	250		0	25		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	0.93	0.92	0.97		1.00		
Frt		0.850	0.906				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1699	1520	1626	0	1433	1676	
Flt Permitted	0.950				0.342		
Satd. Flow (perm)	1574	1397	1626	0	516	1676	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		39	132				
Link Speed (mph)	25		25			25	
Link Distance (ft)	1645		945			1064	
Travel Time (s)	44.9		25.8			29.0	
Confl. Peds. (#/hr)	12	22		1	1		
Confl. Bikes (#/hr)		2		22			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	57	39	160	370	149	93	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	57	39	530	0	149	93	
Turn Type	Prot	pm+ov	NA		D.P+P	NA	
Protected Phases	3	1	2		1	6	4
Permitted Phases		3			2		
Detector Phase	3	1	2		1	6	
Switch Phase							
Minimum Initial (s)	7.0	7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.1	11.6	14.9		11.6	14.9	25.0
Total Split (s)	15.0	18.0	62.0		18.0	80.0	25.0
Total Split (%)	12.5%	15.0%	51.7%		15.0%	66.7%	21%
Maximum Green (s)	9.9	13.4	57.1		13.4	75.1	22.0
Yellow Time (s)	3.0	3.0	3.1		3.0	3.1	3.0
All-Red Time (s)	2.1	1.6	1.8		1.6	1.8	0.0
Lost Time Adjust (s)	0.1	0.4	0.1		0.4	0.4	
Total Lost Time (s)	5.2	5.0	5.0		5.0	5.3	
Lead/Lag	Lead	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Vehicle Extension (s)	1.0	2.0	3.0		2.0	3.0	0.2
Recall Mode	None	None	Min		None	Min	None
Walk Time (s)							7.0
Flash Dont Walk (s)							15.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	7.5	11.2	22.3		29.5	37.2	
Actuated g/C Ratio	0.16	0.24	0.48		0.63	0.80	

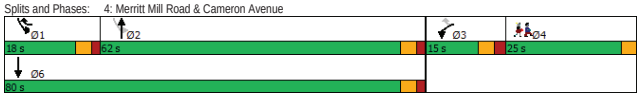
UNC DP TIA 2023 — Existing (2023) AM
4: Merritt Mill Road & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
v/c Ratio	0.21	0.10	0.63		0.32	0.07	
Control Delay	23.0	5.9	11.8		5.2	3.1	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	23.0	5.9	11.8		5.2	3.1	
LOS	C	A	B		A	A	
Approach Delay	16.0		11.8			4.4	
Approach LOS	B		B			A	
Queue Length 50th (ft)	14	0	85		13	8	
Queue Length 95th (ft)	49	17	188		30	20	
Internal Link Dist (ft)	1565		865			984	
Turn Bay Length (ft)		250			25		
Base Capacity (vph)	376	590	1600		653	1676	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.15	0.07	0.33		0.23	0.06	

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 46.7
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 10.2 — Intersection LOS: B
Intersection Capacity Utilization 58.0% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Merritt Mill Road & Cameron Avenue



UNC DP TIA 2023 — Existing (2023) AM
5: Pittsboro Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø4
Lane Configurations								
Traffic Volume (vph)	139	144	490	179	0	0		
Future Volume (vph)	139	144	490	179	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	12	11	12	12	12		
Storage Length (ft)		0	0		0	0		
Storage Lanes		0	2		0	0		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00		
Ped Bike Factor	0.97		0.99					
Frt	0.931							
Flt Protected			0.950					
Satd. Flow (prot)	1510	0	2987	1676	0	0		
Flt Permitted			0.950					
Satd. Flow (perm)	1510	0	2971	1676	0	0		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)	67							
Link Speed (mph)	25			25	25			
Link Distance (ft)	1117			376	564			
Travel Time (s)	30.5			10.3	15.4			
Confl. Peds. (#/hr)		2	2		31			
Confl. Bikes (#/hr)		81						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Adj. Flow (vph)	154	160	544	199	0	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	314	0	544	199	0	0		
Turn Type	NA		Prot	NA				
Protected Phases	2		1 4	6			1	4
Permitted Phases								
Detector Phase	2		1 4	6				
Switch Phase								
Minimum Initial (s)	10.0			10.0			7.0	7.0
Minimum Split (s)	16.2			15.0			12.1	20.0
Total Split (s)	39.0			70.0			31.0	20.0
Total Split (%)	43.3%			77.8%			34%	22%
Maximum Green (s)	33.8			65.0			25.9	16.0
Yellow Time (s)	3.1			3.3			3.0	3.0
All-Red Time (s)	2.1			1.7			2.1	1.0
Lost Time Adjust (s)	-0.2			0.0				
Total Lost Time (s)	5.0			5.0				
Lead/Lag	Lead						Lag	
Lead-Lag Optimize?								
Vehicle Extension (s)	1.0			1.0			4.0	0.2
Recall Mode	Min			Min			None	None
Walk Time (s)	7.0							7.0
Flash Dont Walk (s)	4.0							9.0
Pedestrian Calls (#/hr)	0							0
Act Effct Green (s)	13.7		24.4	32.0				
Actuated g/C Ratio	0.28		0.51	0.66				

Existing (2023) AM.syn — VHB

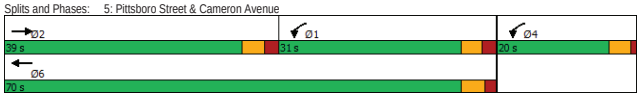
UNC DP TIA 2023 — Existing (2023) AM
5: Pittsboro Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø4
v/c Ratio	0.66		0.36	0.18				
Control Delay	19.7		8.5	3.3				
Queue Delay	0.0		0.0	0.0				
Total Delay	19.7		8.5	3.3				
LOS	B		A	A				
Approach Delay	19.7			7.1				
Approach LOS	B			A				
Queue Length 50th (ft)	57		41	16				
Queue Length 95th (ft)	139		87	30				
Internal Link Dist (ft)	1037			296	484			
Turn Bay Length (ft)								
Base Capacity (vph)	1103		2078	1676				
Starvation Cap Reductn	0		0	0				
Spillback Cap Reductn	0		0	0				
Storage Cap Reductn	0		0	0				
Reduced v/c Ratio	0.28		0.26	0.12				

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 48.3
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 10.9 — Intersection LOS: B
Intersection Capacity Utilization 41.9% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Pittsboro Street & Cameron Avenue



Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	85	0	0	121	36	100	338	28	72	0	469
Future Volume (vph)	19	85	0	0	121	36	100	338	28	72	0	469
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	10	10	10	11	11	12
Storage Length (ft)	110		0	0		0	0		0	300		0
Storage Lanes	1		0	0		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.95	1.00	1.00	0.88
Ped Bike Factor	0.92				0.97		0.90	0.96		0.69		0.87
Frt					0.969			0.989				0.850
Flt Protected	0.950						0.950	0.999		0.950		
Satd. Flow (prot)	1540	1676	0	0	1575	0	1353	2695	0	1540	0	2508
Flt Permitted	0.410						0.950	0.999		0.950		
Satd. Flow (perm)	609	1676	0	0	1575	0	1219	2688	0	1061	0	2192
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)					11			6				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		376			2112			887			972	
Travel Time (s)		10.3			57.6			24.2			26.5	
Confl. Peds. (#/hr)	80		194	194		80	33		156	156		33
Confl. Bikes (#/hr)			58			2			2			7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	21	94	0	0	134	40	111	376	31	80	0	521
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	21	94	0	0	174	0	100	418	0	80	0	521
Turn Type	Perm	NA			NA		Split	NA		Prot		Prot
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Detector Phase	4	4			8		2	2		1		1
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		7.0	7.0		7.0		7.0
Minimum Split (s)	27.1	27.1			30.2		23.2	23.2		25.6		25.6
Total Split (s)	24.0	24.0			24.0		31.0	31.0		36.0		36.0
Total Split (%)	20.0%	20.0%			20.0%		25.8%	25.8%		30.0%		30.0%
Maximum Green (s)	17.9	17.9			17.8		24.8	24.8		30.4		30.4
Yellow Time (s)	3.1	3.1			3.2		3.1	3.1		3.0		3.0
All-Red Time (s)	3.0	3.0			3.0		3.1	3.1		2.6		2.6
Lost Time Adjust (s)	-1.2	-1.2			-1.2		-1.2	-1.2		-0.6		-0.6
Total Lost Time (s)	4.9	4.9			5.0		5.0	5.0		5.0		5.0
Lead/Lag							Lag	Lag		Lead		Lead
Lead-Lag Optimize?							Yes	Yes		Yes		Yes
Vehicle Extension (s)	2.0	2.0			2.0		4.0	4.0		4.0		4.0
Recall Mode	Min	Min			Min		C-Max	C-Max		None		None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0		7.0
Flash Dont Walk (s)	10.0	10.0			17.0		5.0	5.0		13.0		13.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0		0
Act Effct Green (s)	16.6	16.6			16.5		30.5	30.5		30.0		30.0
Actuated g/C Ratio	0.14	0.14			0.14		0.25	0.25		0.25		0.25

Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	29.0
Total Split (%)	24%
Maximum Green (s)	25.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	0.2
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	

Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

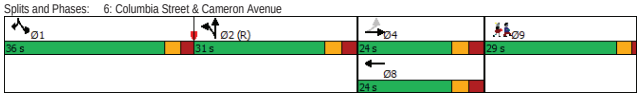
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.25	0.41			0.77		0.29	0.61		0.21		0.83
Control Delay	52.7	51.8			68.7		41.2	44.7		15.8		32.8
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		0.0
Total Delay	52.7	51.8			68.7		41.2	44.7		15.8		32.8
LOS	D	D			E		D	D		B		C
Approach Delay		52.0			68.7			44.0			30.5	
Approach LOS		D			E			D			C	
Queue Length 50th (ft)	15	66			122		72	162		36		210
Queue Length 95th (ft)	41	119			#210		131	225		m58		285
Internal Link Dist (ft)		296			2032			807			892	
Turn Bay Length (ft)	110									300		
Base Capacity (vph)	96	266			258		343	688		406		661
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		0
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.22	0.35			0.67		0.29	0.61		0.20		0.79

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 52 (43%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 42.0 — Intersection LOS: D
Intersection Capacity Utilization 63.9% — ICU Level of Service B
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Columbia Street & Cameron Avenue



UNC DP TIA 2023 — Existing (2023) AM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	Ø9
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — Existing (2023) AM
7: Raleigh Street & Cameron Avenue/Country Club Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	59	29	31	159	266	32	41	12	267	150	48
Future Volume (vph)	17	59	29	31	159	266	32	41	12	267	150	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	9	11	11	10	10	10	10	12	12
Storage Length (ft)	0		0	100		0	100		0	75		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			100			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95		0.92	0.89		0.84	0.92		0.75	0.94	
Frt		0.963			0.906			0.967			0.964	
Flt Protected		0.992		0.950			0.950			0.950		
Satd. Flow (prot)	0	1530	0	1433	1313	0	1486	1394	0	1486	1521	0
Flt Permitted		0.897		0.617			0.702			0.381		
Satd. Flow (perm)	0	1369	0	854	1313	0	918	1394	0	447	1521	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					97			10			14	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2112			312			770			994	
Travel Time (s)		57.6			8.5			21.0			27.1	
Confl. Peds. (#/hr)	37		34	34		37	52		77	77		52
Confl. Bikes (#/hr)			12			6			8			7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	19	66	32	34	177	296	36	46	13	297	167	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	117	0	34	473	0	36	59	0	297	220	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.1	21.1		12.6	21.6		12.3	21.3		11.9	19.1	
Total Split (s)	50.0	50.0		13.0	63.0		13.0	22.0		35.0	44.0	
Total Split (%)	41.7%	41.7%		10.8%	52.5%		10.8%	18.3%		29.2%	36.7%	
Maximum Green (s)	43.9	43.9		7.4	57.4		7.7	16.7		30.1	38.9	
Yellow Time (s)	3.3	3.3		3.0	3.1		3.0	3.1		3.0	3.1	
All-Red Time (s)	2.8	2.8		2.6	2.5		2.3	2.2		1.9	2.0	
Lost Time Adjust (s)		-1.1		-0.6	-0.6		-0.3	-0.3		0.1	-0.1	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)	7.0	7.0			7.0			7.0			7.0	
Flash Dont Walk (s)	8.0	8.0			8.0			7.0			7.0	
Pedestrian Calls (#/hr)	0	0			0			0			0	
Act Effct Green (s)		23.2		26.9	26.9		13.6	10.0		26.3	22.7	
Actuated g/C Ratio		0.35		0.41	0.41		0.21	0.15		0.40	0.35	

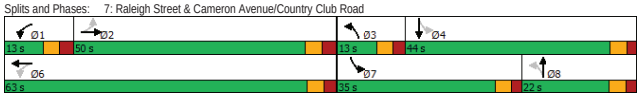
UNC DP TIA 2023 — Existing (2023) AM
7: Raleigh Street & Cameron Avenue/Country Club Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.24		0.08	0.79		0.13	0.27		0.61	0.41	
Control Delay		22.2		14.9	26.1		18.4	34.3		21.6	22.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		22.2		14.9	26.1		18.4	34.3		21.6	22.0	
LOS		C		B	C		B	C		C	C	
Approach Delay		22.2			25.3			28.3			21.8	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)		32		9	140		7	19		73	47	
Queue Length 95th (ft)		104		31	338		34	74		224	188	
Internal Link Dist (ft)		2032			232			690			914	
Turn Bay Length (ft)				100			100			75		
Base Capacity (vph)		1002		437	1104		286	451		859	1024	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.12		0.08	0.43		0.13	0.13		0.35	0.21	

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 65.5
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 23.8 — Intersection LOS: C
Intersection Capacity Utilization 67.3% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 7: Raleigh Street & Cameron Avenue/Country Club Road



UNC DP TIA 2023 — Existing (2023) AM
8: Pittsboro Street & McCauley Street/South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	108	24	170	54	0	0	0	0	88	467	8
Future Volume (vph)	0	108	24	170	54	0	0	0	0	88	467	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			50			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor		0.97		0.91							0.97	
Frt		0.975									0.998	
Flt Protected				0.950							0.992	
Satd. Flow (prot)	0	1433	0	1593	1676	0	0	0	0	0	3145	0
Flt Permitted				0.663							0.992	
Satd. Flow (perm)	0	1433	0	1011	1676	0	0	0	0	0	3060	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24									3	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1050			519			1147			237	
Travel Time (s)		28.6			14.2			31.3			6.5	
Confl. Peds. (#/hr)	85		80	80		85	75		86	86		75
Confl. Bikes (#/hr)			48			1						32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)		0	0									
Adj. Flow (vph)	0	120	27	189	60	0	0	0	0	98	519	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	147	0	189	60	0	0	0	0	0	626	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		22.8		23.6	23.6					23.3	23.3	
Total Split (s)		31.0		31.0	31.0					29.0	29.0	
Total Split (%)		51.7%		51.7%	51.7%					48.3%	48.3%	
Maximum Green (s)		26.2		25.4	25.4					23.7	23.7	
Yellow Time (s)		3.3		3.0	3.0					3.3	3.3	
All-Red Time (s)		1.5		2.6	2.6					2.0	2.0	
Lost Time Adjust (s)		-0.3		-0.3	-0.3						-0.1	
Total Lost Time (s)		4.5		5.3	5.3						5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		Ped		Ped	Ped					Ped	Ped	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		6.0		7.0	7.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		17.1		16.3	16.3						16.7	
Actuated g/C Ratio		0.39		0.37	0.37						0.38	

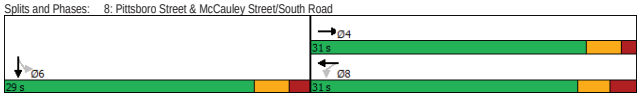
UNC DP TIA 2023 — Existing (2023) AM
8: Pittsboro Street & McCauley Street/South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.26		0.50	0.10						0.53	
Control Delay		9.4		16.4	9.7						12.8	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		9.4		16.4	9.7						12.8	
LOS		A		B	A						B	
Approach Delay		9.4			14.8						12.8	
Approach LOS		A			B						B	
Queue Length 50th (ft)		18		32	9						53	
Queue Length 95th (ft)		55		92	30						120	
Internal Link Dist (ft)		970			439			1067			157	
Turn Bay Length (ft)				100								
Base Capacity (vph)		894		606	1004						1700	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.16		0.31	0.06						0.37	

Intersection Summary

Area Type: CBD
Cycle Length: 60
Actuated Cycle Length: 43.6
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 12.8 — Intersection LOS: B
Intersection Capacity Utilization 51.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 8: Pittsboro Street & McCauley Street/South Road



UNC DP TIA 2023 — Existing (2023) AM
9: Columbia Street & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	184	0	0	191	77	59	353	211	0	0	0
Future Volume (vph)	16	184	0	0	191	77	59	353	211	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	13	13	12	11	11	11	11	11
Storage Length (ft)	75		0	0		125	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.92				1.00	0.88		0.88				
Frt					0.994	0.850		0.949				
Flt Protected	0.950				1628	1399	0	0.995				
Satd. Flow (prot)	1593	1788	0	0				3702	0	0	0	0
Flt Permitted	0.950							0.995				
Satd. Flow (perm)	1469	1788	0	0	1628	1236	0	3666	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3	99		215				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		519			696			500			887	
Travel Time (s)		14.2			19.0			13.6			24.2	
Confl. Peds. (#/hr)	79		131	131		79	56		176	176		56
Confl. Bikes (#/hr)			20			1			8			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	18	204	0	0	212	86	66	392	234	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	18	204	0	0	221	77	0	692	0	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA				
Protected Phases	7	4			8			2				
Permitted Phases						8	2					
Detector Phase	7	4			8	8	2	2				
Switch Phase												
Minimum Initial (s)	4.0	7.0			7.0	7.0	10.0	10.0				
Minimum Split (s)	8.0	12.6			20.0	20.0	26.9	26.9				
Total Split (s)	10.0	38.0			28.0	28.0	38.0	38.0				
Total Split (%)	13.2%	50.0%			36.8%	36.8%	50.0%	50.0%				
Maximum Green (s)	6.0	32.4			25.0	25.0	32.1	32.1				
Yellow Time (s)	3.5	3.5			3.0	3.0	3.4	3.4				
All-Red Time (s)	0.5	2.1			0.0	0.0	2.5	2.5				
Lost Time Adjust (s)	-0.6	-0.6			-0.5	-0.5		-0.9				
Total Lost Time (s)	3.4	5.0			2.5	2.5		5.0				
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	2.0			0.2	0.2	2.0	2.0				
Recall Mode	None	None			None	None	C-Min	C-Min				
Walk Time (s)					7.0	7.0	7.0	7.0				
Flash Dont Walk (s)					10.0	10.0	14.0	14.0				
Pedestrian Calls (#/hr)					0	0	0	0				
Act Effct Green (s)	7.1	15.8			15.9	15.9		50.2				
Actuated g/C Ratio	0.09	0.21			0.21	0.21		0.66				

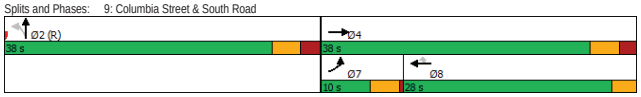
UNC DP TIA 2023 — Existing (2023) AM
9: Columbia Street & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.12	0.55			0.64	0.23		0.28				
Control Delay	32.9	30.9			35.6	5.3		4.9				
Queue Delay	0.0	0.0			0.0	0.0		0.0				
Total Delay	32.9	30.9			35.6	5.3		4.9				
LOS	C	C			D	A		A				
Approach Delay		31.1			27.7			4.9				
Approach LOS		C			C			A				
Queue Length 50th (ft)	8	90			98	0		24				
Queue Length 95th (ft)	26	114			162	23		71				
Internal Link Dist (ft)		439			616			420			807	
Turn Bay Length (ft)	75					125						
Base Capacity (vph)	152	776			548	480		2493				
Starvation Cap Reductn	0	0			0	0		0				
Spillback Cap Reductn	0	0			0	0		0				
Storage Cap Reductn	0	0			0	0		0				
Reduced v/c Ratio	0.12	0.26			0.40	0.16		0.28				

Intersection Summary

Area Type: CBD
Cycle Length: 76
Actuated Cycle Length: 76
Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 15.3 — Intersection LOS: B
Intersection Capacity Utilization 51.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 9: Columbia Street & South Road



UNC DP TIA 2023 — Existing (2023) AM
10: South Road & Raleigh Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	56	212	337	24	45	115
Future Volume (vph)	56	212	337	24	45	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	11	11
Storage Length (ft)	225			190	75	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93			0.84	0.78	0.47
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	1676	1621	1378	1540	1378
Flt Permitted	0.498				0.950	
Satd. Flow (perm)	777	1676	1621	1157	1197	646
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				27		128
Link Speed (mph)		25	25		25	
Link Distance (ft)		516	1148		454	
Travel Time (s)		14.1	31.3		12.4	
Confl. Peds. (#/hr)	72			72	94	243
Confl. Bikes (#/hr)				3		14
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	62	236	374	27	50	128
Shared Lane Traffic (%)						
Lane Group Flow (vph)	62	236	374	27	50	128
Turn Type	D.P+P	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	6			6		4
Detector Phase	5	2	6	6	4	5
Switch Phase						
Minimum Initial (s)	7.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	12.6	15.8	28.8	28.8	24.8	12.6
Total Split (s)	19.0	64.0	45.0	45.0	26.0	19.0
Total Split (%)	21.1%	71.1%	50.0%	50.0%	28.9%	21.1%
Maximum Green (s)	13.4	58.2	39.2	39.2	20.2	13.4
Yellow Time (s)	3.0	3.2	3.2	3.2	3.0	3.0
All-Red Time (s)	2.6	2.6	2.6	2.6	2.8	2.6
Lost Time Adjust (s)	-0.6	-0.7	-0.8	-0.8	-0.6	-0.6
Total Lost Time (s)	5.0	5.1	5.0	5.0	5.2	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Vehicle Extension (s)	1.0	3.0	1.0	1.0	2.0	1.0
Recall Mode	None	Min	Min	Min	None	None
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			16.0	16.0	12.0	
Pedestrian Calls (#/hr)			0	0	0	
Act Effct Green (s)	25.0	32.8	20.0	20.0	8.3	10.7
Actuated g/C Ratio	0.65	0.85	0.52	0.52	0.22	0.28

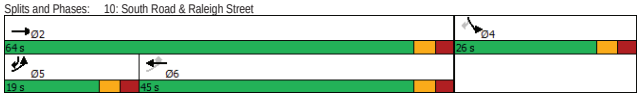
UNC DP TIA 2023 — Existing (2023) AM
10: South Road & Raleigh Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.09	0.17	0.44	0.04	0.15	0.30
Control Delay	3.4	2.9	12.0	5.0	17.7	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	2.9	12.0	5.0	17.7	4.9
LOS	A	A	B	A	B	A
Approach Delay		3.0	11.6		8.5	
Approach LOS		A	B		A	
Queue Length 50th (ft)	0	0	39	0	7	0
Queue Length 95th (ft)	16	49	160	11	39	25
Internal Link Dist (ft)		436	1068		374	
Turn Bay Length (ft)	225			190	75	
Base Capacity (vph)	902	1676	1486	1063	887	647
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.14	0.25	0.03	0.06	0.20

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 38.5
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.44
Intersection Signal Delay: 8.1 — Intersection LOS: A
Intersection Capacity Utilization 54.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 10: South Road & Raleigh Street



Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
11: Country Club Road & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	174	32	453	386	480	19	40	38	267	159	11
Future Volume (vph)	5	174	32	453	386	480	19	40	38	267	159	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	14	12	12	14	12	15	12	11	16	12
Storage Length (ft)	0		0	200		0	0		0	75		0
Storage Lanes	1		0	1		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor	0.95	0.99		0.99		0.91		0.99	0.99		1.00	
Frt		0.976				0.850			0.850		0.993	
Flt Protected	0.950			0.950				0.984		0.950	0.989	
Satd. Flow (prot)	1711	3437	0	1770	1863	1689	0	2016	1583	1625	1965	0
Flt Permitted	0.513			0.433				0.984		0.950	0.989	
Satd. Flow (perm)	876	3437	0	801	1863	1541	0	2002	1560	1625	1965	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				499			92		2	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		362			1042			215			421	
Travel Time (s)		9.9			28.4			4.2			11.5	
Confl. Peds. (#/hr)	39		5	5		39	30					30
Confl. Bikes (#/hr)			1			5			3			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	193	36	503	429	533	21	44	42	297	177	12
Shared Lane Traffic (%)										19%		
Lane Group Flow (vph)	6	229	0	503	429	533	0	65	42	241	245	0
Turn Type	Perm	NA		pm+pt	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases		2		1	6	4	3	3	1	4	4	
Permitted Phases	2			6		6		3	3			
Detector Phase	2	2		1	6	4	3	3	1	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	33.1	33.1		12.1	31.1	42.0	13.6	13.6	12.1	42.0	42.0	
Total Split (s)	35.0	35.0		29.0	64.0	42.0	14.0	14.0	29.0	42.0	42.0	
Total Split (%)	29.2%	29.2%		24.2%	53.3%	35.0%	11.7%	11.7%	24.2%	35.0%	35.0%	
Maximum Green (s)	28.9	28.9		23.9	57.9	35.0	7.4	7.4	23.9	35.0	35.0	
Yellow Time (s)	3.7	3.7		3.0	3.7	3.1	3.3	3.3	3.0	3.1	3.1	
All-Red Time (s)	2.4	2.4		2.1	2.4	3.9	3.3	3.3	2.1	3.9	3.9	
Lost Time Adjust (s)	-0.7	-0.7		-0.1	-0.6	-1.7		-1.3	-0.1	-1.7	-1.7	
Total Lost Time (s)	5.4	5.4		5.0	5.5	5.3		5.3	5.0	5.3	5.3	
Lead/Lag	Lag	Lag		Lead		Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?						Yes				Yes	Yes	
Vehicle Extension (s)	3.0	3.0		1.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	
Recall Mode	Min	Min		None	Min	None	None	None	None	None	None	
Walk Time (s)	7.0	7.0			7.0	7.0				7.0	7.0	
Flash Dont Walk (s)	20.0	20.0			18.0	28.0				28.0	28.0	
Pedestrian Calls (#/hr)	0	0			0	0				0	0	
Act Effct Green (s)	12.6	12.6		37.7	37.1	54.9		9.0	25.8	17.5	17.5	
Actuated g/C Ratio	0.17	0.17		0.49	0.49	0.72		0.12	0.34	0.23	0.23	

Existing (2023) AM.syn — VHB

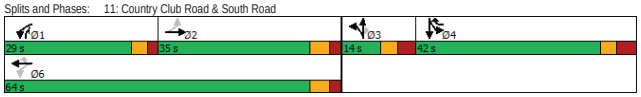
UNC DP TIA 2023 — Existing (2023) AM
11: Country Club Road & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.04	0.39		0.79	0.47	0.42		0.27	0.07	0.65	0.54	
Control Delay	33.8	32.3		26.4	17.2	1.4		40.3	0.3	37.5	32.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	33.8	32.3		26.4	17.2	1.4		40.3	0.3	37.5	32.5	
LOS	C	C		C	B	A		D	A	D	C	
Approach Delay		32.4			14.6			24.6			35.0	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	3	52		172	139	3		31	0	117	114	
Queue Length 95th (ft)	15	97		#327	261	20		79	1	210	203	
Internal Link Dist (ft)		282			962			135			341	
Turn Bay Length (ft)				200						75		
Base Capacity (vph)	362	1432		720	1422	1401		245	716	833	1009	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.02	0.16		0.70	0.30	0.38		0.27	0.06	0.29	0.24	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 76.3
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 21.2 — Intersection LOS: C
Intersection Capacity Utilization 74.0% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Country Club Road & South Road



Existing (2023) AM.syn — VHB

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	334	0	57	0	146	0	429	185	0	0	0
Future Volume (vph)	78	334	0	57	0	146	0	429	185	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			4%			-4%			0%	
Storage Length (ft)	100		0	0		0	100		150	0		0
Storage Lanes	1		0	1		2	1		1	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.92			0.84		0.88			0.97			
Frt						0.850			0.850			
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1778	3557	0	1734	0	2731	0	3610	1615	0	0	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1636	3557	0	1464	0	2397	0	3610	1568	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	132					162			132			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		218			284			267			526	
Travel Time (s)		5.9			7.7			7.3			14.3	
Confl. Peds. (#/hr)	40		87	87		40	14		10	10		14
Confl. Bikes (#/hr)			15						6			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	87	371	0	63	0	162	0	477	206	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	371	0	63	0	162	0	477	206	0	0	0
Turn Type	Prot	NA		Prot		Perm		NA	pm+ov			
Protected Phases	7	4		3				2	3			
Permitted Phases						3		2	2			
Detector Phase	7	4		3		3		2	3			
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0		7.0		10.0	7.0			
Minimum Split (s)	11.9	25.6		12.9		12.9		30.0	12.9			
Total Split (s)	23.0	46.0		28.0		28.0		46.0	28.0			
Total Split (%)	19.2%	38.3%		23.3%		23.3%		38.3%	23.3%			
Maximum Green (s)	18.1	40.4		22.1		22.1		40.0	22.1			
Yellow Time (s)	3.0	3.2		3.0		3.0		3.4	3.0			
All-Red Time (s)	1.9	2.4		2.9		2.9		2.6	2.9			
Lost Time Adjust (s)	0.1	-0.6		-0.9		-0.9		-1.0	-0.9			
Total Lost Time (s)	5.0	5.0		5.0		5.0		5.0	5.0			
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	1.0	1.0		1.0		1.0		3.0	1.0			
Recall Mode	None	None		None		None		C-Min	None			
Walk Time (s)		4.0						4.0				
Flash Dont Walk (s)		16.0						20.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	6.9	17.5		9.5		9.5		78.0	87.5			
Actuated g/C Ratio	0.06	0.15		0.08		0.08		0.65	0.73			

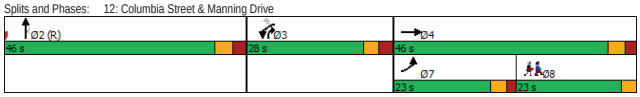
Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	23.0
Total Split (%)	19%
Maximum Green (s)	20.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.38	0.71		0.46		0.48		0.20	0.17			
Control Delay	7.4	56.8		63.4		12.6		15.9	4.2			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	7.4	56.8		63.4		12.6		15.9	4.2			
LOS	A	E		E		B		B	A			
Approach Delay		47.4			26.8			12.4				
Approach LOS		D			C			B				
Queue Length 50th (ft)	0	147		48		0		81	11			
Queue Length 95th (ft)	17	192		92		36		252	126			
Internal Link Dist (ft)		138			204			187			446	
Turn Bay Length (ft)	100								150			
Base Capacity (vph)	378	1215		332		590		2346	1349			
Starvation Cap Reductn	0	0		0		0		0	0			
Spillback Cap Reductn	0	0		0		0		0	0			
Storage Cap Reductn	0	0		0		0		0	0			
Reduced v/c Ratio	0.23	0.31		0.19		0.27		0.20	0.15			

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 26.5 Intersection LOS: C
Intersection Capacity Utilization 54.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 12: Columbia Street & Manning Drive



Lane Group	Ø8
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — Existing (2023) AM
13: West Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	360	106	94	180	13	14	12	7	8	9	15
Future Volume (vph)	26	360	106	94	180	13	14	12	7	8	9	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			3%			0%			-3%	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.91			0.96			0.98			0.95	0.99
Frt		0.968			0.993			0.971				0.850
Flt Protected		0.997			0.984			0.979			0.977	
Satd. Flow (prot)	0	3193	0	0	3403	0	0	1727	0	0	1847	1607
Flt Permitted		0.923			0.682			0.851			0.858	
Satd. Flow (perm)	0	2956	0	0	2261	0	0	1501	0	0	1547	1586
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		51			9			8				72
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		388			334			349			293	
Travel Time (s)		7.6			6.5			9.5			8.0	
Confl. Peds. (#/hr)			107	107					66	66		
Confl. Bikes (#/hr)			7			2			1			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	400	118	104	200	14	16	13	8	9	10	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	547	0	0	318	0	0	37	0	0	19	17
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	20.4	20.4		11.9	23.9		26.7	26.7		28.5	28.5	28.5
Total Split (s)	66.1	66.1		11.9	78.0		32.0	32.0		32.0	32.0	32.0
Total Split (%)	60.1%	60.1%		10.8%	70.9%		29.1%	29.1%		29.1%	29.1%	29.1%
Maximum Green (s)	60.7	60.7		7.0	73.1		26.3	26.3		26.5	26.5	26.5
Yellow Time (s)	3.5	3.5		3.0	3.1		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	1.9	1.9		1.9	1.8		2.4	2.4		2.2	2.2	2.2
Lost Time Adjust (s)		-0.4			0.1			-0.7			-0.5	-0.5
Total Lost Time (s)		5.0			5.0			5.0			5.0	5.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		1.0	2.0		1.0	1.0		1.0	1.0	1.0
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	8.0	8.0			12.0		14.0	14.0		16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)		99.1			99.1			8.0			7.9	7.9
Actuated g/C Ratio		0.90			0.90			0.07			0.07	0.07
v/c Ratio		0.21			0.16			0.32			0.17	0.09
Control Delay		1.4			1.0			47.6			51.3	1.0
Queue Delay		0.0			0.0			0.0			0.0	0.0

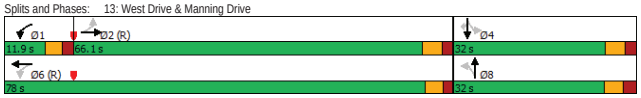
UNC DP TIA 2023 — Existing (2023) AM
13: West Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		1.4			1.0			47.6			51.3	1.0
LOS		A			A			D			D	A
Approach Delay		1.4			1.0			47.6			27.5	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)		25			7			20			13	0
Queue Length 95th (ft)		40			17			53			37	0
Internal Link Dist (ft)		308			254			269			213	
Turn Bay Length (ft)												
Base Capacity (vph)		2667			2037			374			379	443
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.21			0.16			0.10			0.05	0.04

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.32
Intersection Signal Delay: 4.1 — Intersection LOS: A
Intersection Capacity Utilization 52.9% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 13: West Drive & Manning Drive



UNC DP TIA 2023 — Existing (2023) AM
14: East Drive/Hospital Entrance & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	277	137	209	202	53	47	21	194	0	0	0
Future Volume (vph)	66	277	137	209	202	53	47	21	194	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		-4%			3%			-4%			0%	
Storage Length (ft)	150		0	100		0	100		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90	0.91		0.89	0.97				0.87			
Frt		0.950			0.969				0.850			
Flt Protected	0.950			0.950				0.966				
Satd. Flow (prot)	1685	2920	0	1627	3046	0	0	1713	1507	0	0	0
Flt Permitted	0.578			0.480				0.966				
Satd. Flow (perm)	919	2920	0	732	3046	0	0	1713	1305	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		84			45				174			
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		382			469			315			391	
Travel Time (s)		7.4			9.1			8.6			10.7	
Confl. Peds. (#/hr)	88		85	85		88			83	83		
Confl. Bikes (#/hr)			6			1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	73	308	152	232	224	59	52	23	216	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	460	0	232	283	0	0	75	216	0	0	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov			
Protected Phases	5	2		1	6			8	1			
Permitted Phases	6			2			8		8			
Detector Phase	5	2		1	6		8	8	1			
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		7.0	7.0	5.0			
Minimum Split (s)	12.4	25.0		12.4	24.6		27.8	27.8	12.4			
Total Split (s)	16.0	43.0		35.0	62.0		32.0	32.0	35.0			
Total Split (%)	14.5%	39.1%		31.8%	56.4%		29.1%	29.1%	31.8%			
Maximum Green (s)	10.9	37.0		29.6	56.4		26.2	26.2	29.6			
Yellow Time (s)	3.0	3.4		3.0	3.1		3.4	3.4	3.0			
All-Red Time (s)	2.1	2.6		2.4	2.5		2.4	2.4	2.4			
Lost Time Adjust (s)	-0.4	-0.9		-0.4	-0.6			-1.2	-0.4			
Total Lost Time (s)	4.7	5.1		5.0	5.0			4.6	5.0			
Lead/Lag	Lead	Lag		Lead	Lag				Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	1.0	1.0			
Recall Mode	None	C-Min		None	C-Min		None	None	None			
Walk Time (s)		7.0			7.0		7.0	7.0				
Flash Dont Walk (s)		12.0			12.0		15.0	15.0				
Pedestrian Calls (#/hr)		0			0		0	0				
Act Effct Green (s)	89.4	71.9		87.8	85.7			10.1	24.0			

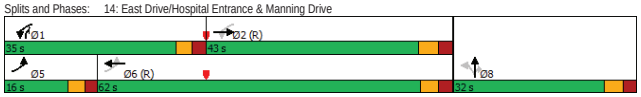
UNC DP TIA 2023 — Existing (2023) AM
14: East Drive/Hospital Entrance & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.81	0.65		0.80	0.78			0.09	0.22			
v/c Ratio	0.09	0.24		0.33	0.12			0.48	0.48			
Control Delay	3.6	13.8		5.8	1.2			57.2	10.5			
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0			
Total Delay	3.6	13.8		5.8	1.2			57.2	10.5			
LOS	A	B		A	A			E	B			
Approach Delay		12.4			3.3			22.5				
Approach LOS		B			A			C				
Queue Length 50th (ft)	10	87		17	0			52	22			
Queue Length 95th (ft)	19	139		89	5			96	71			
Internal Link Dist (ft)		302			389			235			311	
Turn Bay Length (ft)	150			100								
Base Capacity (vph)	856	1936		861	2381			426	621			
Starvation Cap Reductn	0	0		0	0			0	0			
Spillback Cap Reductn	0	0		0	0			0	0			
Storage Cap Reductn	0	0		0	0			0	0			
Reduced v/c Ratio	0.09	0.24		0.27	0.12			0.18	0.35			

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 61 (55%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 11.1 — Intersection LOS: B
Intersection Capacity Utilization 57.2% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 14: East Drive/Hospital Entrance & Manning Drive



UNC DP TIA 2023 — Existing (2023) AM
15: Skipper Bowles Drive/Ridge Road & Manning Drive — Lanes, Volumes, Timings

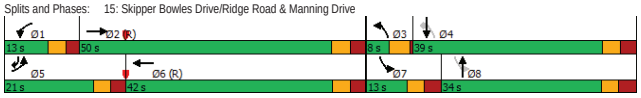
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	221	55	8	473	67	9	39	5	32	142	294
Future Volume (vph)	78	221	55	8	473	67	9	39	5	32	142	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	10	11	12	10	12	12	12	12	12
Grade (%)		-2%			6%			12%			2%	
Storage Length (ft)	100		0	100		0	0		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.92	0.97		0.91	0.98		0.85	0.98		0.88		0.80
Frt		0.970			0.981			0.982				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	3251	0	1602	3178	0	1553	1689	0	1752	1844	1567
Flt Permitted	0.950			0.950			0.514			0.725		
Satd. Flow (perm)	1541	3251	0	1454	3178	0	717	1689	0	1171	1844	1258
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			15			6				157
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		348			791			579			293	
Travel Time (s)		9.5			21.6			15.8			8.0	
Confl. Peds. (#/hr)	99		124	124		99	155		113	113		155
Confl. Bikes (#/hr)			1						1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	87	246	61	9	526	74	10	43	6	36	158	327
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	307	0	9	600	0	10	49	0	36	158	327
Turn Type	Prot	NA		Prot	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases							4			8		4
Detector Phase	5	2		1	6		3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		4.0	7.0		7.0	7.0	7.0
Minimum Split (s)	12.9	35.2		12.8	37.0		8.0	34.3		13.0	33.0	12.9
Total Split (s)	21.0	50.0		13.0	42.0		8.0	34.0		13.0	39.0	21.0
Total Split (%)	19.1%	45.5%		11.8%	38.2%		7.3%	30.9%		11.8%	35.5%	19.1%
Maximum Green (s)	15.4	43.8		7.6	36.0		4.0	27.7		7.0	33.0	15.4
Yellow Time (s)	3.0	3.3		3.0	3.0		3.5	3.0		3.0	3.1	3.0
All-Red Time (s)	2.6	2.9		2.4	3.0		0.5	3.3		3.0	2.9	2.6
Lost Time Adjust (s)	-0.9	-1.3		-0.8	-1.1		-1.2	-1.2		-0.9	-0.9	-0.9
Total Lost Time (s)	4.7	4.9		4.6	4.9		2.8	5.1		5.1	5.1	4.7
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	2.0	3.0		2.0	2.0		3.0	2.0		2.0	2.0	2.0
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			24.0			21.0			20.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	11.2	78.0		7.8	64.6		21.2	11.5		16.4	17.3	28.9

UNC DP TIA 2023 — Existing (2023) AM
15: Skipper Bowles Drive/Ridge Road & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.10	0.71		0.07	0.59		0.19	0.10		0.15	0.16	0.26
v/c Ratio	0.51	0.13		0.08	0.32		0.05	0.27		0.17	0.55	0.69
Control Delay	57.8	5.2		49.5	13.8		31.3	44.4		35.6	49.0	23.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	57.8	5.2		49.5	13.8		31.3	44.4		35.6	49.0	23.6
LOS	E	A		D	B		C	D		D	D	C
Approach Delay		16.8			14.3			42.2			32.1	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)	54	24		6	107		6	29		21	99	91
Queue Length 95th (ft)	109	66		23	194		18	62		44	167	169
Internal Link Dist (ft)		268			711			499			213	
Turn Bay Length (ft)	100			100								100
Base Capacity (vph)	247	2315		122	1872		194	448		217	568	543
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.35	0.13		0.07	0.32		0.05	0.11		0.17	0.28	0.60

Intersection Summary
Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 21.8 — Intersection LOS: C
Intersection Capacity Utilization 66.9% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 15: Skipper Bowles Drive/Ridge Road & Manning Drive



UNC DP TIA 2023 — Existing (2023) AM
16: Columbia Street & Westwood Drive/Mason Farm Road — Lanes, Volumes, Timings

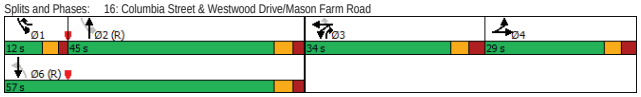
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	6	111	2	62	8	584	456	128	224	3
Future Volume (vph)	2	1	6	111	2	62	8	584	456	128	224	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-1%			-3%			-3%			4%	
Storage Length (ft)	0		0	0		250	150		200	0		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95			0.96	0.93	0.91		0.95		1.00	
Frt		0.905				0.850			0.850		0.998	
Flt Protected		0.990			0.953		0.950			0.950		
Satd. Flow (prot)	0	1602	0	0	1742	1554	1796	1891	1714	1676	1757	0
Flt Permitted		0.990			0.953		0.601			0.283		
Satd. Flow (perm)	0	1589	0	0	1668	1451	1035	1891	1630	499	1757	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				84			496		1	
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		283			749			309			956	
Travel Time (s)		6.4			20.4			8.4			26.1	
Confl. Peds. (#/hr)	21		16	16		21	32		10	10		32
Confl. Bikes (#/hr)			1						12			5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	1	7	123	2	69	9	649	507	142	249	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	125	69	9	649	507	142	252	0
Turn Type	Split	NA		Split	NA	pm+ov	D.Pm	NA	pm+ov	D.P+P	NA	
Protected Phases	4	4		3	3	1		2	3	1	6	
Permitted Phases						3	6		2	2		
Detector Phase	4	4		3	3	1	6	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	10.0	10.0	7.0	7.0	10.0	
Minimum Split (s)	28.3	28.3		33.4	33.4	11.9	16.9	30.9	33.4	11.9	16.9	
Total Split (s)	29.0	29.0		34.0	34.0	12.0	57.0	45.0	34.0	12.0	57.0	
Total Split (%)	24.2%	24.2%		28.3%	28.3%	10.0%	47.5%	37.5%	28.3%	10.0%	47.5%	
Maximum Green (s)	22.7	22.7		27.6	27.6	7.1	51.1	39.1	27.6	7.1	51.1	
Yellow Time (s)	3.3	3.3		3.5	3.5	3.1	3.6	3.6	3.5	3.1	3.6	
All-Red Time (s)	3.0	3.0		2.9	2.9	1.8	2.3	2.3	2.9	1.8	2.3	
Lost Time Adjust (s)		-1.3			-1.4	0.1	-0.9	-0.9	-1.4	0.1	-0.9	
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead		Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None		None	None	None	C-Min	C-Min	None	None	C-Min	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Flash Dont Walk (s)	18.0	18.0		23.0	23.0		7.0	21.0	23.0		7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	
Act Effct Green (s)		8.3			14.6	26.4	92.8	75.9	90.5	87.8	92.8	

UNC DP TIA 2023 — Existing (2023) AM
16: Columbia Street & Westwood Drive/Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.07			0.12	0.22	0.77	0.63	0.75	0.73	0.77	
v/c Ratio		0.09			0.59	0.18	0.01	0.54	0.37	0.30	0.19	
Control Delay		35.3			60.6	4.2	5.8	17.2	1.4	8.5	7.5	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		35.3			60.6	4.2	5.8	17.2	1.4	8.5	7.5	
LOS		D			E	A	A	B	A	A	A	
Approach Delay		35.3			40.5			10.2			7.9	
Approach LOS		D			D			B			A	
Queue Length 50th (ft)		2			93	0	1	244	1	36	68	
Queue Length 95th (ft)		20			149	20	9	555	36	89	151	
Internal Link Dist (ft)		203			669			229			876	
Turn Bay Length (ft)						250	150		200			
Base Capacity (vph)		326			420	394	800	1196	1503	480	1358	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.03			0.30	0.18	0.01	0.54	0.34	0.30	0.19	

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 13.2 — Intersection LOS: B
Intersection Capacity Utilization 68.1% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 16: Columbia Street & Westwood Drive/Mason Farm Road



UNC DP TIA 2023 — Existing (2023) AM
17: West Drive & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	314	11	5	132	38	0	0	0	30	6	19
Future Volume (vph)	143	314	11	5	132	38	0	0	0	30	6	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			4%			0%			1%	
Storage Length (ft)	0		125	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96	0.70		0.96						0.91	
Frt			0.850		0.971						0.954	
Flt Protected		0.985			0.998						0.974	
Satd. Flow (prot)	0	1862	1607	0	1698	0	0	0	0	0	1676	0
Flt Permitted		0.842			0.986						0.974	
Satd. Flow (perm)	0	1533	1119	0	1673	0	0	0	0	0	1570	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			47		30						21	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		344			481			500			293	
Travel Time (s)		9.4			13.1			11.4			8.0	
Confl. Peds. (#/hr)	87		125	125		87	39		75	78		39
Confl. Bikes (#/hr)			2			8						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	159	349	12	6	147	42	0	0	0	33	7	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	508	12	0	195	0	0	0	0	0	61	0
Turn Type	Perm	NA	Perm	Perm	NA					Perm	NA	
Protected Phases		2			6						4	
Permitted Phases	2		2	6						4		
Detector Phase	2	2	2	6	6					4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0					7.0	7.0	
Minimum Split (s)	23.0	23.0	23.0	23.8	23.8					25.6	25.6	
Total Split (s)	32.0	32.0	32.0	32.0	32.0					28.0	28.0	
Total Split (%)	53.3%	53.3%	53.3%	53.3%	53.3%					46.7%	46.7%	
Maximum Green (s)	27.0	27.0	27.0	26.2	26.2					22.4	22.4	
Yellow Time (s)	3.5	3.5	3.5	3.0	3.0					3.2	3.2	
All-Red Time (s)	1.5	1.5	1.5	2.8	2.8					2.4	2.4	
Lost Time Adjust (s)		0.0	0.0		-0.9						-0.2	
Total Lost Time (s)		5.0	5.0		4.9						5.4	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0					2.0	2.0	
Recall Mode	Min	Min	Min	Min	Min					None	None	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0					7.0	7.0	
Flash Dont Walk (s)	6.0	6.0	6.0	9.0	9.0					13.0	13.0	
Pedestrian Calls (#/hr)	0	0	0	0	0					0	0	
Act Effct Green (s)		31.5	31.5		31.5						7.6	
Actuated g/C Ratio		0.85	0.85		0.85						0.20	

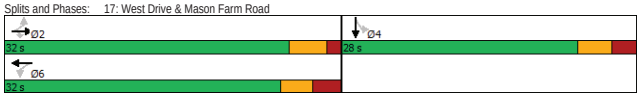
UNC DP TIA 2023 — Existing (2023) AM
17: West Drive & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.39	0.01		0.14						0.18	
Control Delay		4.4	0.2		2.6						13.1	
Queue Delay		0.0	0.0		0.0						0.0	
Total Delay		4.4	0.2		2.6						13.1	
LOS		A	A		A						B	
Approach Delay		4.3			2.6						13.1	
Approach LOS		A			A						B	
Queue Length 50th (ft)		0	0		0						5	
Queue Length 95th (ft)		128	1		35						33	
Internal Link Dist (ft)		264			401			420			213	
Turn Bay Length (ft)			125									
Base Capacity (vph)		1182	874		1302						1002	
Starvation Cap Reductn		0	0		0						0	
Spillback Cap Reductn		0	0		0						0	
Storage Cap Reductn		0	0		0						0	
Reduced v/c Ratio		0.43	0.01		0.15						0.06	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 37.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.39
Intersection Signal Delay: 4.6 — Intersection LOS: A
Intersection Capacity Utilization 65.5% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 17: West Drive & Mason Farm Road



UNC DP TIA 2023 — Existing (2023) AM
18: Mason Farm Road & East Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	219	61	10	79	24	68	29	58	0	0	0
Future Volume (vph)	96	219	61	10	79	24	68	29	58	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	50		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90	0.94		0.87	0.97			0.94				
Frt		0.967			0.965			0.950				
Flt Protected	0.950			0.950				0.978				
Satd. Flow (prot)	1770	1696	0	1770	1742	0	0	1623	0	0	0	0
Flt Permitted	0.609			0.571				0.978				
Satd. Flow (perm)	1017	1696	0	922	1742	0	0	1584	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			18			31				
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		481			155			560			76	
Travel Time (s)		13.1			4.2			15.3			1.7	
Confl. Peds. (#/hr)	63		133	133		63	23		30	30		23
Confl. Bikes (#/hr)			2						9			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	107	243	68	11	88	27	76	32	64	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	107	311	0	11	115	0	0	172	0	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA				
Protected Phases	5	2		1	6		8	8				
Permitted Phases	2			6								
Detector Phase	5	2		1	6		8	8				
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0				
Minimum Split (s)	29.1	29.3		29.8	19.3		24.3	24.3				
Total Split (s)	29.1	33.2		29.8	33.9		27.0	27.0				
Total Split (%)	32.3%	36.9%		33.1%	37.7%		30.0%	30.0%				
Maximum Green (s)	25.0	27.9		25.0	28.6		21.7	21.7				
Yellow Time (s)	3.0	3.2		3.0	3.2		3.0	3.0				
All-Red Time (s)	1.1	2.1		1.8	2.1		2.3	2.3				
Lost Time Adjust (s)	0.9	-0.2		0.4	-0.2			-0.4				
Total Lost Time (s)	5.0	5.1		5.2	5.1			4.9				
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	1.0				
Recall Mode	None	Min		None	Min		None	None				
Walk Time (s)	5.0	7.0		5.0	7.0		7.0	7.0				
Flash Dont Walk (s)	20.0	17.0		20.0	7.0		12.0	12.0				
Pedestrian Calls (#/hr)	0	0		0	0		0	0				
Act Effct Green (s)	21.4	21.6		19.4	17.3			8.9				
Actuated g/C Ratio	0.56	0.56		0.51	0.45			0.23				

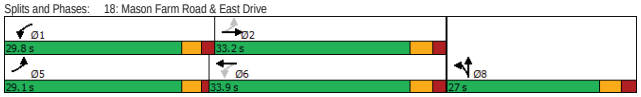
UNC DP TIA 2023 — Existing (2023) AM
18: Mason Farm Road & East Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.15	0.32		0.02	0.14			0.43				
Control Delay	5.6	9.0		5.1	10.5			16.2				
Queue Delay	0.0	0.0		0.0	0.0			0.0				
Total Delay	5.6	9.0		5.1	10.5			16.2				
LOS	A	A		A	B			B				
Approach Delay		8.1			10.0			16.2				
Approach LOS		A			B			B				
Queue Length 50th (ft)	9	28		1	16			27				
Queue Length 95th (ft)	31	135		6	49			85				
Internal Link Dist (ft)		401			75			480			1	
Turn Bay Length (ft)	50			100								
Base Capacity (vph)	1216	1314		1230	1374			1002				
Starvation Cap Reductn	0	0		0	0			0				
Spillback Cap Reductn	0	0		0	0			0				
Storage Cap Reductn	0	0		0	0			0				
Reduced v/c Ratio	0.09	0.24		0.01	0.08			0.17				

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 38.4
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.43
Intersection Signal Delay: 10.4 — Intersection LOS: B
Intersection Capacity Utilization 44.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 18: Mason Farm Road & East Drive



UNC DP TIA 2023 — Existing (2023) AM
19: Mason Farm Road & Purefoy Road — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	136	33	9	146	39	8
Future Volume (vph)	136	33	9	146	39	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.973				0.977	
Flt Protected	0.961			0.997		
Satd. Flow (prot)	1742	0	0	1857	1820	0
Flt Permitted	0.961			0.997		
Satd. Flow (perm)	1742	0	0	1857	1820	0
Link Speed (mph)	25			30	30	
Link Distance (ft)	563			318	480	
Travel Time (s)	15.4			7.2	10.9	
Confl. Peds. (#/hr)	5	42	21			5
Confl. Bikes (#/hr)		13				9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	151	37	10	162	43	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	188	0	0	172	52	0
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type:	Other		
Control Type:	Unsignalized		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

UNC DP TIA 2023 — Existing (2023) AM
19: Mason Farm Road & Purefoy Road — HCM 2010 AWSC

Intersection

Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	136	33	9	146	39	8
Future Vol, veh/h	136	33	9	146	39	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	151	37	10	162	43	9
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.9	8.7	7.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	6%	80%	0%
Vol Thru, %	94%	0%	83%
Vol Right, %	0%	20%	17%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	155	169	47
LT Vol	9	136	0
Through Vol	146	0	39
RT Vol	0	33	8
Lane Flow Rate	172	188	52
Geometry Grp	1	1	1
Degree of Util (X)	0.213	0.234	0.065
Departure Headway (Hd)	4.453	4.495	4.474
Convergence, Y/N	Yes	Yes	Yes
Cap	808	800	802
Service Time	2.468	2.512	2.492
HCM Lane V/C Ratio	0.213	0.235	0.065
HCM Control Delay	8.7	8.9	7.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.8	0.9	0.2

UNC DP TIA 2023 — Existing (2023) AM
20: Skipper Bowles Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	298	17	275	598	1	21
Future Volume (vph)	298	17	275	598	1	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.992					0.850
Flt Protected				0.984	0.950	
Satd. Flow (prot)	3511	0	0	3483	1770	1583
Flt Permitted				0.984	0.950	
Satd. Flow (perm)	3511	0	0	3483	1770	1583
Link Speed (mph)	35			35	35	
Link Distance (ft)	336			902	340	
Travel Time (s)	6.5			17.6	6.6	
Confl. Peds. (#/hr)		7	7			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	331	19	306	664	1	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	350	0	0	970	1	23
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other		
Control Type:	Unsignalized		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

UNC DP TIA 2023 — Existing (2023) AM
20: Skipper Bowles Drive & Manning Drive — HCM 2010 TWSC

Intersection

Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	298	17	275	598	1	21
Future Vol, veh/h	298	17	275	598	1	21
Conflicting Peds, #/hr	0	7	7	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	331	19	306	664	1	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	357	0	1292	182
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	944	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1198	-	155	829
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	339	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1191	-	91	824
Mov Cap-2 Maneuver	-	-	-	-	91	-
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	201	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.5	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	91	824	-	-	1191	-
HCM Lane V/C Ratio	0.012	0.028	-	-	0.257	-
HCM Control Delay (s)	45	9.5	-	-	9.1	1
HCM Lane LOS	E	A	-	-	A	A
HCM 95th %tile Q(veh)	0	0.1	-	-	1	-

UNC DP TIA 2023 — Existing (2023) AM
21: Columbia Street & Purefoy Road — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	4	1014	145	3	359
Future Volume (vph)	26	4	1014	145	3	359
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	250	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.984		0.983			
Flt Protected	0.958				0.950	
Satd. Flow (prot)	1756	0	1831	0	1770	1863
Flt Permitted	0.958				0.950	
Satd. Flow (perm)	1756	0	1831	0	1770	1863
Link Speed (mph)	25		25			25
Link Distance (ft)	654		109			397
Travel Time (s)	17.8		3.0			10.8
Confl. Peds. (#/hr)	8			3	3	
Confl. Bikes (#/hr)		2		3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	4	1127	161	3	399
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	1288	0	3	399
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 72.2% — ICU Level of Service C
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
21: Columbia Street & Purefoy Road — HCM 2010 TWSC

Intersection

Int Delay, s/veh 0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	4	1014	145	3	359
Future Vol, veh/h	26	4	1014	145	3	359
Conflicting Peds, #/hr	8	0	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	4	1127	161	3	399

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1624	1211	0	0	1291	0
Stage 1	1211	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	113	222	-	-	537	-
Stage 1	282	-	-	-	-	-
Stage 2	668	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	111	221	-	-	536	-
Mov Cap-2 Maneuver	111	-	-	-	-	-
Stage 1	281	-	-	-	-	-
Stage 2	659	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	46.6	0	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	119	536	-
HCM Lane V/C Ratio	-	-	0.28	0.006	-
HCM Control Delay (s)	-	-	46.6	11.8	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	1.1	0	-

UNC DP TIA 2023 — Existing (2023) AM
22: Columbia Street & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	529	3	63	173	1109	0	0	272	88
Future Volume (vph)	0	0	0	529	3	63	173	1109	0	0	272	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			2%			-2%	
Storage Length (ft)	0		0	600		600	250		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor				0.99	0.99		1.00					0.98
Frt						0.850						0.850
Flt Protected				0.950	0.953		0.950					
Satd. Flow (prot)	0	0	0	1656	1661	1560	1752	3504	0	0	3575	1599
Flt Permitted				0.950	0.953		0.568					
Satd. Flow (perm)	0	0	0	1642	1648	1560	1044	3504	0	0	3575	1563
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						77						98
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1226			1188			609			378	
Travel Time (s)		33.4			32.4			16.6			10.3	
Confl. Peds. (#/hr)			5	5			2		7	7		2
Confl. Bikes (#/hr)									5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	588	3	70	192	1232	0	0	302	98
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	294	297	70	192	1232	0	0	302	98
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	7.0	10.0			10.0	10.0
Minimum Split (s)				29.8	29.8	29.8	13.8	28.1			16.1	16.1
Total Split (s)				48.0	48.0	48.0	22.0	82.0			60.0	60.0
Total Split (%)				36.9%	36.9%	36.9%	16.9%	63.1%			46.2%	46.2%
Maximum Green (s)				42.2	42.2	42.2	16.2	75.9			53.9	53.9
Yellow Time (s)				3.7	3.7	3.7	3.0	4.0			4.0	4.0
All-Red Time (s)				2.1	2.1	2.1	2.8	2.1			2.1	2.1
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				5.8	5.8	5.8	5.8	6.1			6.1	6.1
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				1.0	1.0	1.0	1.0	3.0			3.0	3.0
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0		7.0				
Flash Dont Walk (s)				17.0	17.0	17.0		15.0				
Pedestrian Calls (#/hr)				0	0	0		0				
Act Effct Green (s)				27.4	27.4	27.4	91.0	90.7			68.7	68.7
Actuated g/C Ratio				0.21	0.21	0.21	0.70	0.70			0.53	0.53

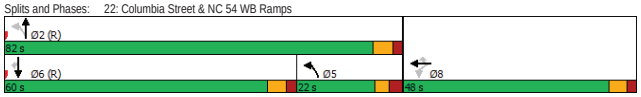
UNC DP TIA 2023 — Existing (2023) AM
22: Columbia Street & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio				0.85	0.86	0.18	0.23	0.50			0.16	0.11
Control Delay				70.7	71.5	7.6	9.2	10.7			17.2	3.9
Queue Delay				0.0	0.0	0.0	0.0	0.1			0.0	0.0
Total Delay				70.7	71.5	7.6	9.2	10.8			17.2	3.9
LOS				E	E	A	A	B			B	A
Approach Delay					64.4			10.6			13.9	
Approach LOS					E			B			B	
Queue Length 50th (ft)				252	255	0	47	229			66	0
Queue Length 95th (ft)				335	338	32	70	313			107	32
Internal Link Dist (ft)		1146			1108			529			298	
Turn Bay Length (ft)				600		600	250					
Base Capacity (vph)				533	534	558	819	2445			1889	872
Starvation Cap Reductn				0	0	0	0	284			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.55	0.56	0.13	0.23	0.57			0.16	0.11

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 13 (10%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 25.5 — Intersection LOS: C
Intersection Capacity Utilization 55.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 22: Columbia Street & NC 54 WB Ramps



UNC DP TIA 2023 — Existing (2023) AM
23: Columbia Street & NC 54 EB Ramps/Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	323	3	321	0	0	0	0	878	0	61	798	0
Future Volume (vph)	323	3	321	0	0	0	0	878	0	61	798	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			0%			3%			-6%	
Storage Length (ft)	250		250	0		0	0		0	250		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98									
Frt			0.850									
Flt Protected	0.950	0.953								0.950		
Satd. Flow (prot)	1664	1670	1567	0	0	0	0	3486	0	1823	3645	0
Flt Permitted	0.950	0.953								0.242		
Satd. Flow (perm)	1664	1670	1543	0	0	0	0	3486	0	464	3645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			213									
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		975			270			219			609	
Travel Time (s)		22.2			6.1			6.0			16.6	
Confl. Peds. (#/hr)							9					9
Confl. Bikes (#/hr)			3						4			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	359	3	357	0	0	0	0	976	0	68	887	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	179	183	357	0	0	0	0	976	0	68	887	0
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	13.2	13.2	13.2					16.0		12.5	27.0	
Total Split (s)	30.0	30.0	30.0					86.0		14.0	100.0	
Total Split (%)	23.1%	23.1%	23.1%					66.2%		10.8%	76.9%	
Maximum Green (s)	23.8	23.8	23.8					80.0		8.5	94.0	
Yellow Time (s)	3.1	3.1	3.1					4.3		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.7		2.4	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2	6.2					6.0		5.5	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	2.0	2.0	2.0					3.0		1.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Walk Time (s)											7.0	
Flash Dont Walk (s)											14.0	
Pedestrian Calls (#/hr)											0	
Act Effct Green (s)	19.1	19.1	19.1					88.7		99.2	98.7	
Actuated g/C Ratio	0.15	0.15	0.15					0.68		0.76	0.76	

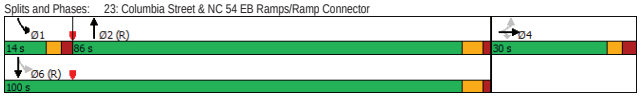
UNC DP TIA 2023 — Existing (2023) AM
23: Columbia Street & NC 54 EB Ramps/Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.73	0.75	0.88					0.41		0.16	0.32	
Control Delay	69.9	71.0	43.4					3.3		1.7	1.3	
Queue Delay	0.0	0.0	0.0					0.0		0.0	0.0	
Total Delay	69.9	71.0	43.4					3.3		1.7	1.3	
LOS	E	E	D					A		A	A	
Approach Delay		57.0						3.3			1.4	
Approach LOS		E						A			A	
Queue Length 50th (ft)	152	156	124					73		2	16	
Queue Length 95th (ft)	231	235	#265					m92		m5	20	
Internal Link Dist (ft)		895			190			139			529	
Turn Bay Length (ft)	250		250							250		
Base Capacity (vph)	304	305	456					2378		443	2766	
Starvation Cap Reductn	0	0	0					0		0	0	
Spillback Cap Reductn	0	0	0					0		0	0	
Storage Cap Reductn	0	0	0					0		0	0	
Reduced v/c Ratio	0.59	0.60	0.78					0.41		0.15	0.32	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 123 (95%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 17.2 — Intersection LOS: B
Intersection Capacity Utilization 55.3% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Columbia Street & NC 54 EB Ramps/Ramp Connector



UNC DP TIA 2023 — Existing (2023) AM
24: Fordham Blvd & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2372	1291	89	0	25
Future Volume (vph)	0	2372	1291	89	0	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.990			0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3504	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	3504	0	0	1611
Link Speed (mph)		45	45		30	
Link Distance (ft)		1661	919		168	
Travel Time (s)		25.2	13.9		3.8	
Confl. Bikes (#/hr)				1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2636	1434	99	0	28
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2636	1533	0	0	28
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 68.9% — ICU Level of Service C
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
24: Fordham Blvd & Mason Farm Road HCM 2010 TWSC

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2372	1291	89	0	25
Future Vol, veh/h	0	2372	1291	89	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2636	1434	99	0	28

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	767
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	345
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	345
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	345
HCM Lane V/C Ratio	-	-	-	0.081
HCM Control Delay (s)	-	-	-	16.3
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.3

UNC DP TIA 2023 — Existing (2023) AM
25: Manning Drive & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	2104	4	9	1306	727	17	5	37	176	2	43
Future Volume (vph)	185	2104	4	9	1306	727	17	5	37	176	2	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			0%			0%			-4%	
Storage Length (ft)	350		0	150		900	0		75	500		400
Storage Lanes	2		0	1		1	0		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor		1.00		1.00				0.99	0.99			0.98
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950				0.963		0.950		
Satd. Flow (prot)	3519	3628	0	1770	3539	1583	0	1794	1583	3502	1900	1615
Flt Permitted	0.950			0.950				0.963		0.950		
Satd. Flow (perm)	3519	3628	0	1768	3539	1583	0	1778	1560	3502	1900	1577
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						426			95			133
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		455			1093			556			574	
Travel Time (s)		6.9			16.6			15.2			11.2	
Confl. Peds. (#/hr)			2	2			5					5
Confl. Bikes (#/hr)									1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	206	2338	4	10	1451	808	19	6	41	196	2	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	206	2342	0	10	1451	808	0	25	41	196	2	48
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6	4	3	3	1	4	4	
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	1	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.2	18.1		13.2	18.3	29.2	13.2	13.2	13.2	29.2	29.2	29.2
Total Split (s)	21.8	123.3		13.2	114.7	30.3	13.2	13.2	13.2	30.3	30.3	30.3
Total Split (%)	12.1%	68.5%		7.3%	63.7%	16.8%	7.3%	7.3%	7.3%	16.8%	16.8%	16.8%
Maximum Green (s)	15.6	117.2		7.0	108.4	24.1	7.0	7.0	7.0	24.1	24.1	24.1
Yellow Time (s)	3.0	4.7		3.0	4.5	3.8	3.8	3.8	3.0	3.8	3.8	3.8
All-Red Time (s)	3.2	1.4		3.2	1.8	2.4	2.4	2.4	3.2	2.4	2.4	2.4
Lost Time Adjust (s)	-1.2	-1.1		-1.2	-1.3	-1.2		-1.2	-1.2	-1.2	-1.2	-1.2
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			
Vehicle Extension (s)	1.0	6.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	3.0		1.0	3.0	3.0	2.0	2.0	1.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	20.0		0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	60.0		0.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Min		None	C-Min	None	None	None	None	None	None	None
Walk Time (s)						7.0				7.0	7.0	7.0
Flash Dont Walk (s)						16.0				16.0	16.0	16.0

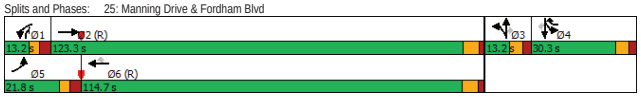
UNC DP TIA 2023 — Existing (2023) AM
25: Manning Drive & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)						0				0	0	0
Act Effct Green (s)	15.1	136.2		8.2	126.6	143.9		8.2	13.1	15.3	15.3	15.3
Actuated g/C Ratio	0.08	0.76		0.05	0.70	0.80		0.05	0.07	0.08	0.08	0.08
v/c Ratio	0.70	0.85		0.12	0.58	0.60		0.31	0.20	0.66	0.01	0.19
Control Delay	92.6	22.0		86.1	16.4	4.0		93.5	2.2	90.1	72.0	1.6
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	92.6	22.0		86.1	16.4	4.0		93.5	2.2	90.1	72.0	1.6
LOS	F	C		F	B	A		F	A	F	E	A
Approach Delay		27.7			12.3			36.8			72.7	
Approach LOS		C			B			D			E	
Queue Length 50th (ft)	124	1091		12	467	67		29	0	118	2	0
Queue Length 95th (ft)	169	1404		35	645	146		67	0	158	12	0
Internal Link Dist (ft)		375			1013			476			494	
Turn Bay Length (ft)	350			150		900			75	500		400
Base Capacity (vph)	338	2745		80	2489	1415		81	202	492	267	335
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.61	0.85		0.13	0.58	0.57		0.31	0.20	0.40	0.01	0.14

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 77 (43%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 23.1 — Intersection LOS: C
Intersection Capacity Utilization 89.5% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 25: Manning Drive & Fordham Blvd



UNC DP TIA 2023 — Existing (2023) AM
26: Oteys Road & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	20	11	2	97	18	35	1	1	3	3	21
Future Volume (vph)	46	20	11	2	97	18	35	1	1	3	3	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	10	10	12	10	12	10	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.979			0.997			0.893	
Flt Protected		0.971			0.999			0.955			0.995	
Satd. Flow (prot)	0	1656	0	0	1700	0	0	1774	0	0	1655	0
Flt Permitted		0.971			0.999			0.955			0.995	
Satd. Flow (perm)	0	1656	0	0	1700	0	0	1774	0	0	1655	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1056			735			360			503	
Travel Time (s)		28.8			20.0			9.8			13.7	
Confl. Peds. (#/hr)	22		1	1		22			3	3		
Confl. Bikes (#/hr)			1			4						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	51	22	12	2	108	20	39	1	1	3	3	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	85	0	0	130	0	0	41	0	0	29	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 26.9% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
26: Oteys Road & Mason Farm Road — HCM 2010 AWSC

Intersection

Intersection Delay, s/veh 7.7
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	46	20	11	2	97	18	35	1	1	3	3	21
Future Vol, veh/h	46	20	11	2	97	18	35	1	1	3	3	21
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	51	22	12	2	108	20	39	1	1	3	3	23
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	7.8	7.9	7.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	95%	60%	2%	11%
Vol Thru, %	3%	26%	83%	11%
Vol Right, %	3%	14%	15%	78%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	37	77	117	27
LT Vol	35	46	2	3
Through Vol	1	20	97	3
RT Vol	1	11	18	21
Lane Flow Rate	41	86	130	30
Geometry Grp	1	1	1	1
Degree of Util (X)	0.053	0.1	0.146	0.033
Departure Headway (Hd)	4.61	4.193	4.035	4.008
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	782	846	880	898
Service Time	2.611	2.263	2.099	2.01
HCM Lane V/C Ratio	0.052	0.102	0.148	0.033
HCM Control Delay	7.9	7.7	7.8	7.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.5	0.1

UNC DP TIA 2023 — Existing (2023) AM
27: Boundary Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	290	13	55	602	71	3	18	17	42	19	8
Future Volume (vph)	11	290	13	55	602	71	3	18	17	42	19	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	12	11	11	12
Grade (%)		-3%			1%			2%			-1%	
Storage Length (ft)	0		0	0		0	50		0	75		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.98	0.99		1.00	0.99	
Frt		0.994			0.985			0.927			0.955	
Flt Protected		0.998			0.996		0.950			0.950		
Satd. Flow (prot)	0	3564	0	0	3444	0	1694	1642	0	1754	1747	0
Flt Permitted		0.926			0.904		0.851			0.851		
Satd. Flow (perm)	0	3306	0	0	3126	0	1494	1642	0	1569	1747	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			26			19			9	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1100			226			551			371	
Travel Time (s)		30.0			6.2			15.0			10.1	
Confl. Peds. (#/hr)	7					7	17		1	1		17
Confl. Bikes (#/hr)						6			1			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	12	322	14	61	669	79	3	20	19	47	21	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	348	0	0	809	0	3	39	0	47	30	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.4	15.4		15.6	15.6		12.6	12.6		24.7	24.7	
Total Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		45.0%	45.0%		45.0%	45.0%	
Maximum Green (s)	27.6	27.6		27.4	27.4		21.4	21.4		21.3	21.3	
Yellow Time (s)	3.7	3.7		3.5	3.5		3.7	3.7		3.9	3.9	
All-Red Time (s)	1.7	1.7		2.1	2.1		1.9	1.9		1.8	1.8	
Lost Time Adjust (s)		-0.4			-0.6		-0.6	-0.6		-0.7	-0.7	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		1.0	1.0		1.0	1.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										12.0	12.0	
Pedestrian Calls (#/hr)										0	0	

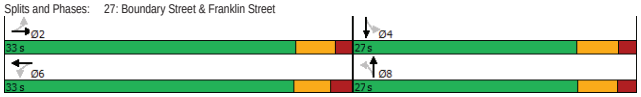
UNC DP TIA 2023 — Existing (2023) AM
27: Boundary Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		24.1			24.1		7.8	7.8		7.8	7.8	
Actuated g/C Ratio		0.71			0.71		0.23	0.23		0.23	0.23	
v/c Ratio		0.15			0.37		0.01	0.10		0.13	0.07	
Control Delay		4.0			4.9		11.7	9.1		12.7	10.3	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		4.0			4.9		11.7	9.1		12.7	10.3	
LOS		A			A		B	A		B	B	
Approach Delay		4.0			4.9			9.3			11.8	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)		16			44		1	3		8	3	
Queue Length 95th (ft)		30			74		5	18		26	17	
Internal Link Dist (ft)		1020			146			471			291	
Turn Bay Length (ft)							50			75		
Base Capacity (vph)		2741			2595		973	1075		1021	1140	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.13			0.31		0.00	0.04		0.05	0.03	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 34.1
Natural Cycle: 45
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.37
Intersection Signal Delay: 5.2 — Intersection LOS: A
Intersection Capacity Utilization 53.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 27: Boundary Street & Franklin Street



UNC DP TIA 2023 — Existing (2023) AM
28: Park Place & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	345	2	34	725	0	10
Future Volume (vph)	345	2	34	725	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	9	12
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.865	
Flt Protected				0.998		
Satd. Flow (prot)	3536	0	0	3532	1450	0
Flt Permitted				0.998		
Satd. Flow (perm)	3536	0	0	3532	1450	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	461			1129	375	
Travel Time (s)	12.6			30.8	10.2	
Confl. Peds. (#/hr)		9	9		2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	383	2	38	806	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	385	0	0	844	11	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 44.9% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
28: Park Place & Franklin Street — HCM 2010 TWSC

Intersection

Int Delay, s/veh 0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	345	2	34	725	0	10
Future Vol, veh/h	345	2	34	725	0	10
Conflicting Peds, #/hr	0	9	9	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	383	2	38	806	0	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	394	0	874	202
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	481	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1161	-	289	805
Stage 1	-	-	-	-	651	-
Stage 2	-	-	-	-	588	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1154	-	269	800
Mov Cap-2 Maneuver	-	-	-	-	269	-
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	552	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	800	-	-	1154	-
HCM Lane V/C Ratio	0.014	-	-	0.033	-
HCM Control Delay (s)	9.6	-	-	8.2	0.2
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	-

UNC DP TIA 2023 — Existing (2023) AM
29: Battle Lane & Boundary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	50	41	0	0	65	36	0	55	14
Future Volume (vph)	0	0	0	50	41	0	0	65	36	0	55	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt								0.952			0.972	
Flt Protected					0.973							
Satd. Flow (prot)	0	0	0	0	1812	0	0	1773	0	0	1811	0
Flt Permitted					0.973							
Satd. Flow (perm)	0	0	0	0	1812	0	0	1773	0	0	1811	0
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		92			498			70			394	
Travel Time (s)		2.1			13.6			1.9			10.7	
Confl. Peds. (#/hr)			15			9	1		23	23		1
Confl. Bikes (#/hr)												3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	56	46	0	0	72	40	0	61	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	102	0	0	112	0	0	77	0
Sign Control		Stop			Stop			Yield			Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 28.8% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
30: Country Club Road & Battle Lane — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	42	303	365	101	105	0
Future Volume (vph)	42	303	365	101	105	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.971			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1809	0	1770	0
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1809	0	1770	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		90	508		70	
Travel Time (s)		2.5	13.9		1.9	
Confl. Peds. (#/hr)	9			23		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	337	406	112	117	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	337	518	0	117	0
Sign Control		Free	Free		Yield	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 45.0% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
31: Country Club Road & Paul Green Theater Drive/Gimghoul Road — Lanes, Volumes, Timings

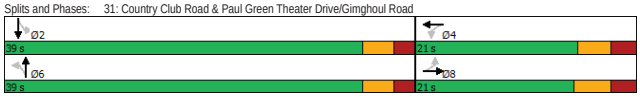
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	10	6	1	6	56	524	4	8	389	24
Future Volume (vph)	2	0	10	6	1	6	56	524	4	8	389	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			2%			1%			1%	
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.98		0.98	1.00			1.00	
Frt		0.886			0.937			0.999			0.992	
Flt Protected		0.992			0.977		0.950				0.999	
Satd. Flow (prot)	0	1625	0	0	1662	0	1761	1851	0	0	1828	0
Flt Permitted		0.992					0.495				0.990	
Satd. Flow (perm)	0	1635	0	0	1688	0	896	1851	0	0	1812	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			7			1			8	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		153			324			421			824	
Travel Time (s)		4.2			8.8			11.5			22.5	
Confl. Peds. (#/hr)	5		9	9		5	18		4	4		18
Confl. Bikes (#/hr)						1			1			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	0	11	7	1	7	62	582	4	9	432	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	0	0	15	0	62	586	0	0	468	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2	2	
Detector Phase	8	8		4	4		6	6		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	21.0	21.0		18.6	18.6		15.1	15.1		15.1	15.1	
Total Split (s)	21.0	21.0		21.0	21.0		39.0	39.0		39.0	39.0	
Total Split (%)	35.0%	35.0%		35.0%	35.0%		65.0%	65.0%		65.0%	65.0%	
Maximum Green (s)	15.0	15.0		15.4	15.4		33.9	33.9		33.9	33.9	
Yellow Time (s)	3.5	3.5		3.1	3.1		3.1	3.1		3.1	3.1	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-0.6		-0.1	-0.1			-0.1	
Total Lost Time (s)		5.0			5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	11.0	11.0		9.0	9.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		8.3			7.9		31.0	31.0			31.0	
Actuated g/C Ratio		0.25			0.24		0.92	0.92			0.92	

UNC DP TIA 2023 — Existing (2023) AM
31: Country Club Road & Paul Green Theater Drive/Gimghoul Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.03			0.04		0.07	0.34			0.28	
Control Delay		2.7			11.0		2.0	2.4			2.1	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		2.7			11.0		2.0	2.4			2.1	
LOS		A			B		A	A			A	
Approach Delay		2.7			11.0			2.4			2.1	
Approach LOS		A			B			A			A	
Queue Length 50th (ft)		0			1		0	0			0	
Queue Length 95th (ft)		5			14		16	128			94	
Internal Link Dist (ft)		73			244			341			744	
Turn Bay Length (ft)							50					
Base Capacity (vph)		822			832		846	1747			1711	
Starvation Cap Reductn		0			0		0	27			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.02			0.02		0.07	0.34			0.27	

Intersection Summary
Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 33.6
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.34
Intersection Signal Delay: 2.4 — Intersection LOS: A
Intersection Capacity Utilization 52.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 31: Country Club Road & Paul Green Theater Drive/Gimghoul Road



UNC DP TIA 2023 — Existing (2023) AM
32: Hibbard Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	444	16	13	407	33	4	16	12	35	10	44
Future Volume (vph)	48	444	16	13	407	33	4	16	12	35	10	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			2%			-5%			-2%	
Storage Length (ft)	150		0	75		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.77	0.98		0.66	0.96			0.87			0.76	
Frt		0.995			0.989			0.950			0.933	
Flt Protected	0.950			0.950				0.994			0.981	
Satd. Flow (prot)	1778	3453	0	1752	3323	0	0	1615	0	0	1452	0
Flt Permitted	0.471			0.464				0.969			0.856	
Satd. Flow (perm)	683	3453	0	566	3323	0	0	1528	0	0	1137	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			9			13			48	
Link Speed (mph)		25			25			25			20	
Link Distance (ft)		469			330			188			294	
Travel Time (s)		12.8			9.0			5.1			10.0	
Confl. Peds. (#/hr)	208		340	340		208	249		190	190		249
Confl. Bikes (#/hr)			1						6			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	53	493	18	14	452	37	4	18	13	39	11	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	511	0	14	489	0	0	35	0	0	99	0
Turn Type	D.P+P	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.3	18.5		22.5	22.5		29.3	29.3		29.3	29.3	
Total Split (s)	19.0	69.0		50.0	50.0		41.0	41.0		41.0	41.0	
Total Split (%)	17.3%	62.7%		45.5%	45.5%		37.3%	37.3%		37.3%	37.3%	
Maximum Green (s)	13.7	63.5		44.5	44.5		34.7	34.7		34.7	34.7	
Yellow Time (s)	3.0	3.2		3.2	3.2		3.5	3.5		3.0	3.0	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.8	2.8		3.3	3.3	
Lost Time Adjust (s)	-0.1	-0.3		-0.4	-0.4			-1.3			-1.3	
Total Lost Time (s)	5.2	5.2		5.1	5.1			5.0			5.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		6.0		10.0	10.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	83.9	88.0		78.1	78.1			11.8			11.8	
Actuated g/C Ratio	0.76	0.80		0.71	0.71			0.11			0.11	

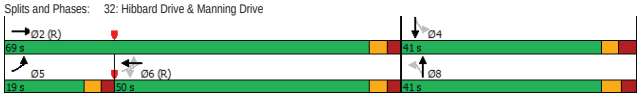
UNC DP TIA 2023 — Existing (2023) AM
32: Hibbard Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.09	0.18		0.03	0.21			0.20			0.60	
Control Delay	3.2	2.7		8.5	9.0			32.8			40.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	3.2	2.7		8.5	9.0			32.8			40.6	
LOS	A	A		A	A			C			D	
Approach Delay		2.7			9.0			32.8			40.6	
Approach LOS		A			A			C			D	
Queue Length 50th (ft)	5	26		4	87			14			35	
Queue Length 95th (ft)	19	63		11	114			43			87	
Internal Link Dist (ft)		389			250			108			214	
Turn Bay Length (ft)	150			75								
Base Capacity (vph)	683	2765		401	2361			508			404	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.08	0.18		0.03	0.21			0.07			0.25	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 42 (38%), Referenced to phase 2:EBT and 6:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 9.4 — Intersection LOS: A
Intersection Capacity Utilization 53.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 32: Hibbard Drive & Manning Drive



UNC DP TIA 2023 — Existing (2023) AM
33: Paul Harden Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	370	18	154	626	28	8	10	25	23	1	9
Future Volume (vph)	7	370	18	154	626	28	8	10	25	23	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	12	10	10	12
Grade (%)		-2%			2%			8%			-11%	
Storage Length (ft)	200		0	0		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	1.00		0.96	0.99		0.80	0.86		0.83	0.81	
Frt		0.993			0.994			0.892			0.864	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3533	0	1752	3465	0	1586	1285	0	1742	1276	0
Flt Permitted	0.371			0.501			0.750			0.732		
Satd. Flow (perm)	679	3533	0	887	3465	0	998	1285	0	1113	1276	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			6			28			10	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		433			267			379			301	
Travel Time (s)		11.8			7.3			10.3			8.2	
Confl. Peds. (#/hr)	31		26	26		31	150		126	126		150
Confl. Bikes (#/hr)			1						2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	411	20	171	696	31	9	11	28	26	1	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	431	0	171	727	0	9	39	0	26	11	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.9	23.1		11.9	22.1		28.8	28.8		30.3	30.3	
Total Split (s)	15.0	58.0		20.0	63.0		32.0	32.0		32.0	32.0	
Total Split (%)	13.6%	52.7%		18.2%	57.3%		29.1%	29.1%		29.1%	29.1%	
Maximum Green (s)	10.1	52.9		15.1	57.9		26.2	26.2		25.7	25.7	
Yellow Time (s)	3.0	3.3		3.0	3.3		3.0	3.0		3.5	3.5	
All-Red Time (s)	1.9	1.8		1.9	1.8		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.2	-0.1		0.1	0.1		-0.4	-0.4		-0.9	-0.9	
Total Lost Time (s)	5.1	5.0		5.0	5.2		5.4	5.4		5.4	5.4	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			10.0		16.0	16.0		17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	94.9	80.5		91.0	95.5		8.7	8.7		8.9	8.9	

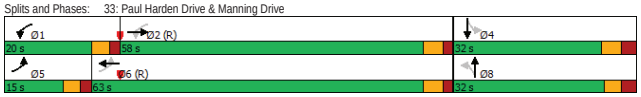
UNC DP TIA 2023 — Existing (2023) AM
33: Paul Harden Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.86	0.73		0.83	0.87		0.08	0.08		0.08	0.08	
v/c Ratio	0.01	0.17		0.21	0.24		0.11	0.31		0.29	0.10	
Control Delay	4.1	8.3		2.0	2.2		49.1	28.8		55.4	26.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.1	8.3		2.0	2.2		49.1	28.8		55.4	26.5	
LOS	A	A		A	A		D	C		E	C	
Approach Delay		8.2			2.2			32.6			46.8	
Approach LOS		A			A			C			D	
Queue Length 50th (ft)	1	40		16	37		6	7		18	1	
Queue Length 95th (ft)	9	115		20	77		22	40		46	18	
Internal Link Dist (ft)		353			187			299			221	
Turn Bay Length (ft)	200						75			100		
Base Capacity (vph)	689	2587		879	3009		241	331		269	316	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.17		0.19	0.24		0.04	0.12		0.10	0.03	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 35 (32%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.31
Intersection Signal Delay: 6.2 — Intersection LOS: A
Intersection Capacity Utilization 57.1% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 33: Paul Harden Drive & Manning Drive



UNC DP TIA 2023 — Existing (2023) AM
34: East Drive & Dogwood Deck Entrance/Jackson Circle — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	1	0	1	17	282	4	56	98	207
Future Volume (vph)	0	0	0	1	0	1	17	282	4	56	98	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	12	12	10	12	12
Storage Length (ft)	0		0	0		0	100		0	75		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998			0.898	
Flt Protected					0.976		0.950			0.950		
Satd. Flow (prot)	0	0	0	0	1694	0	1652	1859	0	1652	1673	0
Flt Permitted					0.976		0.950			0.950		
Satd. Flow (perm)	0	0	0	0	1694	0	1652	1859	0	1652	1673	0
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		321			259			210			315	
Travel Time (s)		7.3			7.1			5.7			8.6	
Confl. Peds. (#/hr)	19					19	4		1	1		4
Confl. Bikes (#/hr)									2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1	0	1	19	313	4	62	109	230
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2	0	19	317	0	62	339	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 39.5% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
34: East Drive & Dogwood Deck Entrance/Jackson Circle — HCM 2010 TWSC

Intersection
Int Delay, s/veh 0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	0	1	17	282	4	56	98	207
Future Vol, veh/h	0	0	0	1	0	1	17	282	4	56	98	207
Conflicting Peds, #/hr	19	0	0	0	0	19	4	0	1	1	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	3670016	-	-	0	-	-	0	-	-	0	-	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	1	0	1	19	313	4	62	109	230

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	702	821	335	343	0	0	318	0	0
Stage 1	354	354	-	-	-	-	-	-	-
Stage 2	348	467	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	404	309	707	1216	-	-	1242	-	-
Stage 1	710	630	-	-	-	-	-	-	-
Stage 2	715	562	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	377	0	695	1216	-	-	1241	-	-
Mov Cap-2 Maneuver	377	0	-	-	-	-	-	-	-
Stage 1	698	0	-	-	-	-	-	-	-
Stage 2	679	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0.4	1.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1216	-	-	489	1241	-	-
HCM Lane V/C Ratio	0.016	-	-	0.005	0.05	-	-
HCM Control Delay (s)	8	-	-	12.4	8.1	-	-
HCM Lane LOS	A	-	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	-	-

UNC DP TIA 2023 — Existing (2023) AM
35: East Drive & Dogwood Deck Exit — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	166	93	0	152	60	0
Future Volume (vph)	166	93	0	152	60	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1770	1583	0	1863	1863	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	1583	0	1863	1863	0
Link Speed (mph)	30			25	30	
Link Distance (ft)	134			176	210	
Travel Time (s)	3.0			4.8	4.8	
Confl. Peds. (#/hr)	8	1	6			6
Confl. Bikes (#/hr)						8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	184	103	0	169	67	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	184	103	0	169	67	0
Sign Control	Stop			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 24.0% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
35: East Drive & Dogwood Deck Exit — HCM 2010 TWSC

Intersection
Int Delay, s/veh 5.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	166	93	0	152	60	0
Future Vol, veh/h	166	93	0	152	60	0
Conflicting Peds, #/hr	8	1	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	184	103	0	169	67	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	244	68	-	0	-	0
Stage 1	67	-	-	-	-	-
Stage 2	177	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	744	995	0	-	-	0
Stage 1	956	-	0	-	-	0
Stage 2	854	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	744	994	-	-	-	-
Mov Cap-2 Maneuver	744	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	854	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	744	994	-
HCM Lane V/C Ratio	-	0.248	0.104	-
HCM Control Delay (s)	-	11.4	9	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	1	0.3	-

UNC DP TIA 2023 — Existing (2023) AM
36: Mason Farm Road & Hibbard Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	35	12	10	143	100	3	4	2	22	4	24
Future Volume (vph)	36	35	12	10	143	100	3	4	2	22	4	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.947			0.970			0.934	
Flt Protected		0.979			0.998			0.984			0.979	
Satd. Flow (prot)	0	1729	0	0	1702	0	0	1659	0	0	1590	0
Flt Permitted		0.979			0.998			0.984			0.979	
Satd. Flow (perm)	0	1729	0	0	1702	0	0	1659	0	0	1590	0
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		221			213			480			560	
Travel Time (s)		6.0			5.8			10.9			15.3	
Confl. Peds. (#/hr)	3		4	4		3	29		59	59		29
Confl. Bikes (#/hr)									20			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	40	39	13	11	159	111	3	4	2	24	4	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	92	0	0	281	0	0	9	0	0	55	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 39.2% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
36: Mason Farm Road & Hibbard Drive — HCM 2010 TWSC

Intersection
Int Delay, s/veh 11.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	35	12	10	143	100	3	4	2	22	4	24
Future Vol, veh/h	36	35	12	10	143	100	3	4	2	22	4	24
Conflicting Peds, #/hr	3	0	4	4	0	3	29	0	59	59	0	29
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	40	39	13	11	159	111	3	4	2	24	4	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	244	166	51	166	178	67	60	0	0	65	0	0
Stage 1	95	95	-	70	70	-	-	-	-	-	-	-
Stage 2	149	71	-	96	108	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	710	727	1017	798	716	997	1544	-	-	1537	-	-
Stage 1	912	816	-	940	837	-	-	-	-	-	-	-
Stage 2	854	836	-	911	806	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	491	666	992	706	656	950	1510	-	-	1468	-	-
Mov Cap-2 Maneuver	491	666	-	706	656	-	-	-	-	-	-	-
Stage 1	890	784	-	896	798	-	-	-	-	-	-	-
Stage 2	602	797	-	837	775	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	12.6	2.5	3.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1510	-	-	602	750	1468	-	-
HCM Lane V/C Ratio	0.002	-	-	0.153	0.375	0.017	-	-
HCM Control Delay (s)	7.4	0	-	12.1	12.6	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	1.7	0.1	-	-

UNC DP TIA 2023 — Existing (2023) AM
37: Bell Tower Drive & South Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	228	105	108	233	48	92
Future Volume (vph)	228	105	108	233	48	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	50		0	100
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.83		0.75		0.38	0.48
Frt	0.957					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1482	0	1770	1863	1770	1583
Flt Permitted			0.484		0.950	
Satd. Flow (perm)	1482	0	678	1863	678	753
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	37					102
Link Speed (mph)	25			25	30	
Link Distance (ft)	696			744	512	
Travel Time (s)	19.0			20.3	11.6	
Confl. Peds. (#/hr)		217	217		410	211
Confl. Bikes (#/hr)		24				4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	253	117	120	259	53	102
Shared Lane Traffic (%)						
Lane Group Flow (vph)	370	0	120	259	53	102
Turn Type	NA		D.P+P	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			2		8	8
Detector Phase	2		1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	7.0	7.0
Minimum Split (s)	22.4		12.4	15.4	22.5	22.5
Total Split (s)	50.4		14.4	64.8	25.2	25.2
Total Split (%)	56.0%		16.0%	72.0%	28.0%	28.0%
Maximum Green (s)	45.0		9.0	59.4	20.1	20.1
Yellow Time (s)	3.3		3.0	3.3	3.4	3.4
All-Red Time (s)	2.1		2.4	2.1	1.7	1.7
Lost Time Adjust (s)	-0.5		-0.4	-0.4	-0.1	-0.1
Total Lost Time (s)	4.9		5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?			Yes			
Vehicle Extension (s)	3.0		1.0	3.0	2.0	2.0
Recall Mode	Min		None	Min	None	None
Walk Time (s)	7.0				7.0	7.0
Flash Dont Walk (s)	10.0				10.0	10.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	24.0		27.9	33.3	9.8	9.8
Actuated g/C Ratio	0.50		0.58	0.69	0.20	0.20
v/c Ratio	0.49		0.21	0.20	0.39	0.44

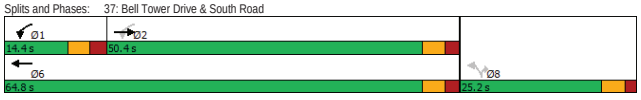
UNC DP TIA 2023 — Existing (2023) AM
37: Bell Tower Drive & South Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	14.5		5.8	5.1	29.0	11.9
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	14.5		5.8	5.1	29.0	11.9
LOS	B		A	A	C	B
Approach Delay	14.5			5.3	17.7	
Approach LOS	B			A	B	
Queue Length 50th (ft)	74		11	26	13	0
Queue Length 95th (ft)	176		35	71	49	37
Internal Link Dist (ft)	616			664	432	
Turn Bay Length (ft)			50			100
Base Capacity (vph)	1332		640	1823	303	393
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.28		0.19	0.14	0.17	0.26

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 48.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.49
Intersection Signal Delay: 11.2 — Intersection LOS: B
Intersection Capacity Utilization 53.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 37: Bell Tower Drive & South Road



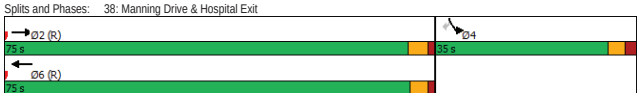
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	393	246	0	89	32
Future Volume (vph)	0	393	246	0	89	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					0.95	0.95
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3539	3539	0	1770	1583
Flt Permitted					0.950	
Satd. Flow (perm)	0	3539	3539	0	1684	1501
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						36
Link Speed (mph)		35	35		20	
Link Distance (ft)		334	382		292	
Travel Time (s)		6.5	7.4		10.0	
Confl. Peds. (#/hr)	109			109	38	32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	437	273	0	99	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	437	273	0	99	36
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		10.0	10.0		7.0	7.0
Minimum Split (s)		14.7	19.4		31.1	31.1
Total Split (s)		75.0	75.0		35.0	35.0
Total Split (%)		68.2%	68.2%		31.8%	31.8%
Maximum Green (s)		70.3	70.6		29.9	29.9
Yellow Time (s)		3.3	3.0		3.0	3.0
All-Red Time (s)		1.4	1.4		2.1	2.1
Lost Time Adjust (s)		0.3	0.6		-0.1	-0.1
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		2.0	2.0		2.0	2.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		19.0	19.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		89.1	89.1		10.9	10.9
Actuated g/C Ratio		0.81	0.81		0.10	0.10
v/c Ratio		0.15	0.10		0.57	0.20
Control Delay		1.9	1.4		59.4	16.5
Queue Delay		0.2	0.0		0.0	0.0
Total Delay		2.1	1.4		59.4	16.5
LOS		A	A		E	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Approach Delay		2.1	1.4		47.9	
Approach LOS		A	A		D	
Queue Length 50th (ft)		16	9		68	0
Queue Length 95th (ft)		22	15		119	30
Internal Link Dist (ft)		254	302		212	
Turn Bay Length (ft)						
Base Capacity (vph)		2868	2868		482	435
Starvation Cap Reductn		1565	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.34	0.10		0.21	0.08

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 53 (48%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 9.2 — Intersection LOS: A
Intersection Capacity Utilization 37.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 38: Manning Drive & Hospital Exit



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	348	130	177	430	10	20
Future Volume (vph)	348	130	177	430	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.959					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3394	0	1770	3539	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3394	0	1770	3539	1770	1583
Link Speed (mph)	25			25	15	
Link Distance (ft)	330			433	367	
Travel Time (s)	9.0			11.8	16.7	
Confl. Peds. (#/hr)		17	17		19	
Confl. Bikes (#/hr)		9				1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	387	144	197	478	11	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	531	0	197	478	11	22
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 37.4% — ICU Level of Service A
Analysis Period (min) 15

Intersection

Int Delay, s/veh 2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	348	130	177	430	10	20
Future Vol, veh/h	348	130	177	430	10	20
Conflicting Peds, #/hr	0	17	17	0	19	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	387	144	197	478	11	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	548	0	1128	283
Stage 1	-	-	-	-	476	-
Stage 2	-	-	-	-	652	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1018	-	198	714
Stage 1	-	-	-	-	591	-
Stage 2	-	-	-	-	480	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1004	-	154	704
Mov Cap-2 Maneuver	-	-	-	-	154	-
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	380	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	16.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	154	704	-	-	1004	-
HCM Lane V/C Ratio	0.072	0.032	-	-	0.196	-
HCM Control Delay (s)	30.2	10.3	-	-	9.5	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.7	-

UNC DP TIA 2023 — Existing (2023) AM
101: US 15/501 & Estes Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	3	204	9	2	5	244	1177	5	2	1173	79
Future Volume (vph)	111	3	204	9	2	5	244	1177	5	2	1173	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		0	150		0	250		0	220		225
Storage Lanes	0		2	0		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.98			0.99							
Frt			0.850		0.955			0.999				0.850
Flt Protected		0.953			0.973		0.950			0.950		
Satd. Flow (prot)	0	1758	2760	0	1691	0	3400	3501	0	1752	3505	1568
Flt Permitted		0.953			0.973		0.950			0.950		
Satd. Flow (perm)	0	1717	2760	0	1691	0	3400	3501	0	1752	3505	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			227		6							66
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		1824			872			1606			1920	
Travel Time (s)		41.5			19.8			24.3			29.1	
Confl. Peds. (#/hr)	7					7						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	123	3	227	10	2	6	271	1308	6	2	1303	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	126	227	0	18	0	271	1314	0	2	1303	88
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	3	3	5	4	4		5	2		1	6	3
Permitted Phases			3									6
Detector Phase	3	3	5	4	4		5	2		1	6	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.6	13.6	13.7	13.7	13.7		13.7	18.1		13.5	18.1	13.6
Total Split (s)	22.0	22.0	37.0	20.0	20.0		37.0	123.0		15.0	101.0	22.0
Total Split (%)	12.2%	12.2%	20.6%	11.1%	11.1%		20.6%	68.3%		8.3%	56.1%	12.2%
Maximum Green (s)	15.4	15.4	30.3	13.3	13.3		30.3	116.9		8.5	94.9	15.4
Yellow Time (s)	3.8	3.8	3.0	3.2	3.2		3.0	4.4		3.0	4.6	3.8
All-Red Time (s)	2.8	2.8	3.7	3.5	3.5		3.7	1.7		3.5	1.5	2.8
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.6	6.7		6.7		6.7	6.1		6.5	6.1	6.6
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	3.0	1.0	1.0		3.0	6.0		3.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)		17.8	44.0		7.1		19.6	138.2		7.3	114.9	134.8
Actuated g/C Ratio		0.10	0.24		0.04		0.11	0.77		0.04	0.64	0.75

UNC DP TIA 2023 — Existing (2023) AM
101: US 15/501 & Estes Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.72	0.27		0.25		0.73	0.49		0.03	0.58	0.07
Control Delay		101.5	5.8		71.4		89.3	10.2		64.0	8.8	0.4
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		101.5	5.8		71.4		89.3	10.2		64.0	8.8	0.4
LOS		F	A		E		F	B		E	A	A
Approach Delay		39.9			71.4			23.8			8.4	
Approach LOS		D			E			C			A	
Queue Length 50th (ft)		146	0		14		162	300		2	104	0
Queue Length 95th (ft)		223	38		45		210	500		m3	161	4
Internal Link Dist (ft)		1744			792			1526			1840	
Turn Bay Length (ft)							250			220		225
Base Capacity (vph)		180	996		130		572	2688		82	2237	1196
Starvation Cap Reductn		0	0		0		0	0		0	0	0
Spillback Cap Reductn		0	0		0		0	0		0	0	0
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		0.70	0.23		0.14		0.47	0.49		0.02	0.58	0.07

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 19.3 — Intersection LOS: B
Intersection Capacity Utilization 65.4% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: US 15/501 & Estes Drive



UNC DP TIA 2023 — Existing (2023) AM
102: US 15/501 & Willow Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	13	22	50	36	35	145	1170	34	26	1277	245
Future Volume (vph)	61	13	22	50	36	35	145	1170	34	26	1277	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	220		0	220		260
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.98		0.98	0.99			1.00				0.97
Frt		0.905			0.926			0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1633	0	1752	1694	0	1752	3489	0	1752	3505	1568
Flt Permitted	0.444			0.732			0.130			0.168		
Satd. Flow (perm)	819	1633	0	1321	1694	0	240	3489	0	310	3505	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			23			3				199
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		1227			1197			1920			792	
Travel Time (s)		33.5			32.6			29.1			12.0	
Confl. Peds. (#/hr)			11	11			2					2
Confl. Bikes (#/hr)						3			1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	68	14	24	56	40	39	161	1300	38	29	1419	272
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	38	0	56	79	0	161	1338	0	29	1419	272
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	12.0
Minimum Split (s)	15.0	33.0		15.0	33.0		15.0	90.0		15.0	80.0	80.0
Total Split (s)	21.0	39.0		15.0	33.0		15.0	111.0		15.0	111.0	111.0
Total Split (%)	11.7%	21.7%		8.3%	18.3%		8.3%	61.7%		8.3%	61.7%	61.7%
Maximum Green (s)	14.7	32.6		9.1	26.6		8.9	104.9		9.4	104.9	104.9
Yellow Time (s)	3.0	3.9		3.0	3.9		3.0	4.6		3.0	4.6	4.6
All-Red Time (s)	3.3	2.5		2.9	2.5		3.1	1.5		2.6	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.4		5.9	6.4		6.1	6.1		5.6	6.1	6.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Walk Time (s)		4.0									5.0	5.0
Flash Dont Walk (s)		22.0									9.0	9.0
Pedestrian Calls (#/hr)		0									0	0
Act Effct Green (s)	23.1	13.6		19.8	10.8		137.8	129.4		130.6	123.1	123.1

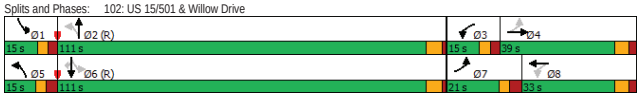
UNC DP TIA 2023 — Existing (2023) AM
102: US 15/501 & Willow Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.13	0.08		0.11	0.06		0.77	0.72		0.73	0.68	0.68
v/c Ratio	0.42	0.26		0.34	0.64		0.60	0.53		0.10	0.59	0.25
Control Delay	73.6	39.7		69.6	80.7		25.7	7.1		5.1	13.6	4.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.6	0.0
Total Delay	73.6	39.7		69.6	80.7		25.7	7.1		5.1	14.2	4.0
LOS	E	D		E	F		C	A		A	B	A
Approach Delay		61.5			76.1			9.1			12.5	
Approach LOS		E			E			A			B	
Queue Length 50th (ft)	72	16		59	66		23	180		7	328	33
Queue Length 95th (ft)	118	56		101	126		88	126		m11	518	74
Internal Link Dist (ft)		1147			1117			1840			712	
Turn Bay Length (ft)	200						220			220		260
Base Capacity (vph)	198	315		171	269		274	2509		304	2397	1100
Starvation Cap Reductn	0	0		0	0		0	0		0	536	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.34	0.12		0.33	0.29		0.59	0.53		0.10	0.76	0.25

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 177 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 15.0 — Intersection LOS: B
Intersection Capacity Utilization 72.4% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: US 15/501 & Willow Drive



UNC DP TIA 2023 — Existing (2023) AM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	27	33	141	89	51	136	99	1096	54	5	68	1204
Future Volume (vph)	27	33	141	89	51	136	99	1096	54	5	68	1204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	525		150	350		150	350		175		225	
Storage Lanes	1		1	2		1	1		1		1	
Taper Length (ft)	25			25			25				25	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Ped Bike Factor												
Frt			0.850			0.850			0.850			
Flt Protected	0.950			0.950			0.950				0.950	
Satd. Flow (prot)	1752	1863	1568	3433	1863	1583	1752	3505	1583	0	1768	3505
Flt Permitted	0.950			0.950			0.158				0.192	
Satd. Flow (perm)	1752	1863	1568	3433	1863	1583	291	3505	1583	0	357	3505
Right Turn on Red			Yes			Yes			Yes			
Satd. Flow (RTOR)			60			98			60			
Link Speed (mph)		30			30			45				45
Link Distance (ft)		828			950			792				1376
Travel Time (s)		18.8			21.6			12.0				20.8
Confl. Peds. (#/hr)							1					
Peak Hour Factor	0.90	0.92	0.90	0.92	0.92	0.92	0.90	0.90	0.92	0.90	0.92	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	103%	100%	100%
Heavy Vehicles (%)	3%	2%	3%	2%	2%	2%	3%	3%	2%	3%	2%	3%
Adj. Flow (vph)	30	36	157	97	55	148	110	1218	59	6	74	1338
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	36	157	97	55	148	110	1218	59	0	80	1338
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	7	4	5	3	8	1!	5	2	3	1!	1	6
Permitted Phases			4			8	6		2	2	2	
Detector Phase	7	4	5	3	8	1	5	2	3	1	1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	12.0
Minimum Split (s)	13.4	43.5	13.3	13.6	40.5	13.4	13.3	42.5	13.6	13.4	13.4	36.5
Total Split (s)	14.0	43.5	22.0	16.0	45.5	15.0	22.0	105.5	16.0	15.0	15.0	98.5
Total Split (%)	7.8%	24.2%	12.2%	8.9%	25.3%	8.3%	12.2%	58.6%	8.9%	8.3%	8.3%	54.7%
Maximum Green (s)	7.6	37.0	15.7	9.4	39.0	8.6	15.7	99.0	9.4	8.6	8.6	92.0
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.5	3.0	3.0	3.0	4.5
All-Red Time (s)	3.4	2.7	3.3	3.6	2.7	3.4	3.3	2.0	3.6	3.4	3.4	2.0
Lost Time Adjust (s)	-1.4	-1.5	-1.3	-1.6	-1.5	-1.4	-1.3	-1.5	-1.6		-1.4	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes			Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	45.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	None	C-Min
Walk Time (s)		7.0			7.0			7.0				7.0
Flash Dont Walk (s)		30.0			27.0			29.0				23.0

Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	28
Future Volume (vph)	28
Ideal Flow (vphpl)	1900
Storage Length (ft)	100
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Ped Bike Factor	0.98
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1568
Flt Permitted	
Satd. Flow (perm)	1532
Right Turn on Red	Yes
Satd. Flow (RTOR)	98
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	0.90
Growth Factor	100%
Heavy Vehicles (%)	3%
Adj. Flow (vph)	31
Shared Lane Traffic (%)	
Lane Group Flow (vph)	31
Turn Type	pm+ov
Protected Phases	7
Permitted Phases	6
Detector Phase	7
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	13.4
Total Split (s)	14.0
Total Split (%)	7.8%
Maximum Green (s)	7.6
Yellow Time (s)	3.0
All-Red Time (s)	3.4
Lost Time Adjust (s)	-1.4
Total Lost Time (s)	5.0
Lead/Lag	Lead
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Minimum Gap (s)	2.0
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	None
Walk Time (s)	
Flash Dont Walk (s)	

Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Pedestrian Calls (#/hr)		0			0			0				0
Act Effct Green (s)	9.6	10.1	25.0	11.2	11.7	22.5	141.4	132.8	149.0		141.4	128.8
Actuated g/C Ratio	0.05	0.06	0.14	0.06	0.06	0.12	0.79	0.74	0.83		0.79	0.72
v/c Ratio	0.32	0.35	0.58	0.46	0.46	0.52	0.33	0.47	0.04		0.23	0.53
Control Delay	90.9	90.2	51.4	88.0	92.5	31.8	8.1	8.4	0.5		5.7	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0		0.0	0.0
Total Delay	90.9	90.2	51.4	88.0	92.5	31.8	8.1	8.5	0.5		5.7	11.7
LOS	F	F	D	F	F	C	A	A	A		A	B
Approach Delay		63.0			61.1			8.1				11.1
Approach LOS		E			E			A				B
Queue Length 50th (ft)	35	42	107	58	64	53	20	233	0		19	287
Queue Length 95th (ft)	74	84	181	91	115	129	49	254	6		34	351
Internal Link Dist (ft)		748			870			712				1296
Turn Bay Length (ft)	525		150	350		150	350		175		225	
Base Capacity (vph)	95	398	306	226	419	295	372	2586	1326		361	2508
Starvation Cap Reductn	0	0	0	0	0	0	0	402	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0		0	45
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.32	0.09	0.51	0.43	0.13	0.50	0.30	0.56	0.04		0.22	0.54

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 17.8 — Intersection LOS: B
Intersection Capacity Utilization 67.1% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 103: US 15/501 & Elliott Road



Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	SBR
Pedestrian Calls (#/hr)	
Act Effct Green (s)	138.4
Actuated g/C Ratio	0.77
v/c Ratio	0.03
Control Delay	0.0
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	m0
Internal Link Dist (ft)	
Turn Bay Length (ft)	100
Base Capacity (vph)	1204
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.03

Intersection Summary

Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
104: US 15/501 & Eastgate/Ephesus Church Road — Lanes, Volumes, Timings

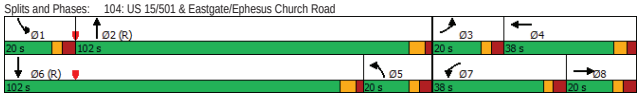
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	22	79	160	47	12	93	956	123	33	989	10
Future Volume (vph)	48	22	79	160	47	12	93	956	123	33	989	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	260		200	220		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	0.99	0.98			0.99		1.00				1.00	
Frt		0.882			0.970				0.850		0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1600	0	3400	1779	0	1752	3505	1568	1752	3501	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1730	1600	0	3400	1779	0	1751	3505	1568	1752	3501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		79			6				226		1	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		448			1242			1376			811	
Travel Time (s)		12.2			33.9			20.8			12.3	
Confl. Peds. (#/hr)	8					8	1					1
Confl. Bikes (#/hr)			3			2						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	53	24	88	178	52	13	103	1062	137	37	1099	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	112	0	178	65	0	103	1062	137	37	1110	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Free	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									Free			
Detector Phase	3	8		7	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	20.0	36.9		33.8	37.7		20.0	80.0		18.0	68.0	
Total Split (s)	20.0	20.0		38.0	38.0		20.0	102.0		20.0	102.0	
Total Split (%)	11.1%	11.1%		21.1%	21.1%		11.1%	56.7%		11.1%	56.7%	
Maximum Green (s)	13.6	13.1		31.2	31.3		13.2	95.2		13.3	95.3	
Yellow Time (s)	3.0	3.0		3.0	3.8		3.0	4.5		3.0	4.5	
All-Red Time (s)	3.4	3.9		3.8	2.9		3.8	2.3		3.7	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.9		6.8	6.7		6.8	6.8		6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.0	2.0		4.0	6.0		2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	60.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	

UNC DP TIA 2023 — Existing (2023) AM
104: US 15/501 & Eastgate/Ephesus Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		23.0			24.0			17.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	10.0	10.4		14.8	18.4		13.2	121.7	180.0	8.7	114.4	
Actuated g/C Ratio	0.06	0.06		0.08	0.10		0.07	0.68	1.00	0.05	0.64	
v/c Ratio	0.55	0.67		0.64	0.35		0.80	0.45	0.09	0.44	0.50	
Control Delay	102.6	47.4		90.3	73.9		121.3	15.0	0.1	101.2	14.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	102.6	47.4		90.3	73.9		121.3	15.0	0.1	101.2	14.1	
LOS	F	D		F	E		F	B	A	F	B	
Approach Delay		65.2			85.9			21.8			16.9	
Approach LOS		E			F			C			B	
Queue Length 50th (ft)	62	39		107	67		128	268	0	43	333	
Queue Length 95th (ft)	113	109		148	119		#241	280	0	m79	393	
Internal Link Dist (ft)		368			1162			1296			731	
Turn Bay Length (ft)				200			260		200	220		
Base Capacity (vph)	132	195		589	314		128	2369	1568	129	2226	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.40	0.57		0.30	0.21		0.80	0.45	0.09	0.29	0.50	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 8 (4%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 27.8 — Intersection LOS: C
Intersection Capacity Utilization 65.0% — ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: US 15/501 & Eastgate/Ephesus Church Road



Existing (2023) AM.syn VHB

UNC DP TIA 2023 — Existing (2023) AM
105: US 15/501 SB & Erwin Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Lane Configurations							
Traffic Volume (vph)	0	0	1631	274	0	452	
Future Volume (vph)	0	0	1631	274	0	452	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0			0	0	300	
Storage Lanes	0			1	0	1	
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.88	
Ped Bike Factor							
Frt				0.850		0.850	
Flt Protected							
Satd. Flow (prot)	0	0	5036	1568	0	2760	
Flt Permitted							
Satd. Flow (perm)	0	0	5036	1568	0	2760	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				101		35	
Link Speed (mph)		45	45		35		
Link Distance (ft)		777	779		938		
Travel Time (s)		11.8	11.8		18.3		
Confl. Peds. (#/hr)					4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	
Adj. Flow (vph)	0	0	1812	304	0	502	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	1812	304	0	502	
Turn Type			NA	Free		Prot	
Protected Phases			6			8	4
Permitted Phases				Free			
Detector Phase			6			8	
Switch Phase							
Minimum Initial (s)			12.0			7.0	7.0
Minimum Split (s)			117.0			27.4	15.0
Total Split (s)			117.0			63.0	63.0
Total Split (%)			65.0%			35.0%	35%
Maximum Green (s)			110.8			57.6	57.6
Yellow Time (s)			4.5			3.0	3.0
All-Red Time (s)			1.7			2.4	2.4
Lost Time Adjust (s)			0.0			0.0	
Total Lost Time (s)			6.2			5.4	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)			6.0			0.2	1.0
Minimum Gap (s)			2.0			2.0	2.0
Time Before Reduce (s)			15.0			0.0	0.0
Time To Reduce (s)			45.0			0.0	0.0
Recall Mode			C-Max			None	None
Walk Time (s)						7.0	
Flash Dont Walk (s)						15.0	

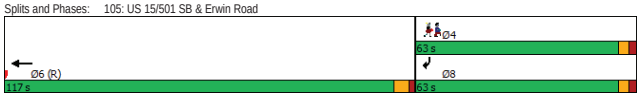
Existing (2023) AM.syn VHB

UNC DP TIA 2023 — Existing (2023) AM
105: US 15/501 SB & Erwin Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Pedestrian Calls (#/hr)						0	
Act Effct Green (s)			133.9	180.0		34.5	
Actuated g/C Ratio			0.74	1.00		0.19	
v/c Ratio			0.48	0.19		0.90	
Control Delay			6.2	0.2		85.8	
Queue Delay			0.2	0.0		0.0	
Total Delay			6.4	0.2		85.8	
LOS			A	A		F	
Approach Delay			5.5		85.8		
Approach LOS			A		F		
Queue Length 50th (ft)			197	0		313	
Queue Length 95th (ft)			227	0		371	
Internal Link Dist (ft)		697	699		858		
Turn Bay Length (ft)						300	
Base Capacity (vph)			3746	1568		907	
Starvation Cap Reductn			816	0		0	
Spillback Cap Reductn			0	0		0	
Storage Cap Reductn			0	0		0	
Reduced v/c Ratio			0.62	0.19		0.55	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 128 (71%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 20.9 — Intersection LOS: C
Intersection Capacity Utilization 57.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 105: US 15/501 SB & Erwin Road



Existing (2023) AM.syn VHB

UNC DP TIA 2023 — Existing (2023) AM
106: Europa Drive & US 15/501 NB — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations							
Traffic Volume (vph)	1802	97	0	0	0	143	
Future Volume (vph)	1802	97	0	0	0	143	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		250	0		0	0	
Storage Lanes		1	0		0	2	
Taper Length (ft)			25		25		
Lane Util. Factor	0.86	1.00	1.00	1.00	1.00	0.88	
Ped Bike Factor							
Frt		0.850				0.850	
Flt Protected							
Satd. Flow (prot)	6408	1583	0	0	0	2787	
Flt Permitted							
Satd. Flow (perm)	6408	1583	0	0	0	2787	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		41				57	
Link Speed (mph)	45			45	25		
Link Distance (ft)	764			605	662		
Travel Time (s)	11.6			9.2	18.1		
Confl. Peds. (#/hr)					4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	2002	108	0	0	0	159	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	2002	108	0	0	0	159	
Turn Type	NA	Free				Prot	
Protected Phases	2					4	8
Permitted Phases		Free					
Detector Phase	2					4	
Switch Phase							
Minimum Initial (s)	12.0					7.0	7.0
Minimum Split (s)	126.0					26.0	28.3
Total Split (s)	145.0					35.0	35.0
Total Split (%)	80.6%					19.4%	19%
Maximum Green (s)	138.2					29.7	29.7
Yellow Time (s)	4.5					3.0	3.0
All-Red Time (s)	2.3					2.3	2.3
Lost Time Adjust (s)	0.0					0.0	
Total Lost Time (s)	6.8					5.3	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	6.0					1.0	0.2
Minimum Gap (s)	2.0					2.0	2.0
Time Before Reduce (s)	15.0					0.0	0.0
Time To Reduce (s)	45.0					0.0	0.0
Recall Mode	C-Max					None	None
Walk Time (s)							7.0
Flash Dont Walk (s)							16.0
Pedestrian Calls (#/hr)							2
Act Effct Green (s)	155.8	180.0				12.1	

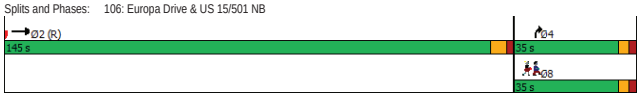
UNC DP TIA 2023 — Existing (2023) AM
106: Europa Drive & US 15/501 NB — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Actuated g/C Ratio	0.87	1.00				0.07	
v/c Ratio	0.36	0.07				0.66	
Control Delay	1.9	0.1				64.5	
Queue Delay	0.1	0.0				0.0	
Total Delay	2.0	0.1				64.5	
LOS	A	A				E	
Approach Delay	1.9				64.5		
Approach LOS	A				E		
Queue Length 50th (ft)	36	0				68	
Queue Length 95th (ft)	92	0				109	
Internal Link Dist (ft)	684			525	582		
Turn Bay Length (ft)		250					
Base Capacity (vph)	5545	1583				507	
Starvation Cap Reductn	1828	0				0	
Spillback Cap Reductn	0	0				0	
Storage Cap Reductn	0	0				0	
Reduced v/c Ratio	0.54	0.07				0.31	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 44 (24%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 6.3 — Intersection LOS: A
Intersection Capacity Utilization 42.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 106: Europa Drive & US 15/501 NB



Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
107: NB/EB U-Turn & US 15/501 SB — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1663	293	0
Future Volume (vph)	0	0	0	1663	293	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Right Turn on Red		Yes			Yes	Yes
Satd. Flow (RTOR)					94	
Link Speed (mph)	45			45	35	
Link Distance (ft)	779			295	205	
Travel Time (s)	11.8			4.5	4.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1848	326	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1848	326	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				12.0	7.0	
Minimum Split (s)				120.0	60.0	
Total Split (s)				150.0	30.0	
Total Split (%)				83.3%	16.7%	
Maximum Green (s)				143.3	23.5	
Yellow Time (s)				4.7	4.0	
All-Red Time (s)				2.0	2.5	
Lost Time Adjust (s)				0.0	0.0	
Total Lost Time (s)				6.7	6.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				6.0	5.0	
Minimum Gap (s)				2.0	2.0	
Time Before Reduce (s)				15.0	0.0	
Time To Reduce (s)				45.0	0.0	
Recall Mode				C-Max	None	
Act Effct Green (s)				147.5	19.3	
Actuated g/C Ratio				0.82	0.11	
v/c Ratio				0.64	0.72	
Control Delay				4.4	61.1	
Queue Delay				0.1	0.0	
Total Delay				4.5	61.1	
LOS				A	E	
Approach Delay				4.5	61.1	
Approach LOS				A	E	

Existing (2023) AM.syn — VHB

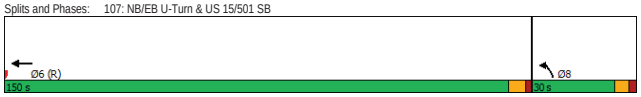
UNC DP TIA 2023 — Existing (2023) AM
107: NB/EB U-Turn & US 15/501 SB — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Queue Length 50th (ft)				161	127	
Queue Length 95th (ft)				m184	173	
Internal Link Dist (ft)	699			215	125	
Turn Bay Length (ft)						
Base Capacity (vph)				2900	529	
Starvation Cap Reductn				128	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.67	0.62	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 87 (48%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 13.0 — Intersection LOS: B
Intersection Capacity Utilization 100.7% — ICU Level of Service G
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: NB/EB U-Turn & US 15/501 SB



Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
108: US 15/501 NB & SB/WB U-Turn — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1839	0	0	0	0	0	0	0	72	39	0
Future Volume (vph)	0	1839	0	0	0	0	0	0	0	72	39	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected										0.950		
Satd. Flow (prot)	0	3539	0	0	0	0	0	0	0	3433	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	3539	0	0	0	0	0	0	0	3433	1863	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										61		
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1186			764			262			186	
Travel Time (s)		18.0			11.6			6.0			3.6	
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.90	0.90	0.92	0.92	0.90	0.90	0.92	0.92	0.92	0.90	0.92	0.90
Adj. Flow (vph)	0	2043	0	0	0	0	0	0	0	80	42	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2043	0	0	0	0	0	0	0	80	42	0
Turn Type		NA								Split	NA	
Protected Phases		2								4	4	
Permitted Phases												
Detector Phase		2								4	4	
Switch Phase												
Minimum Initial (s)		12.0								7.0	7.0	
Minimum Split (s)		150.0								30.0	30.0	
Total Split (s)		145.0								35.0	35.0	
Total Split (%)		80.6%								19.4%	19.4%	
Maximum Green (s)		138.8								29.0	29.0	
Yellow Time (s)		4.7								4.0	4.0	
All-Red Time (s)		1.5								2.0	2.0	
Lost Time Adjust (s)		-1.2								-1.0	0.0	
Total Lost Time (s)		5.0								5.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0								1.0	1.0	
Minimum Gap (s)		2.0								2.0	2.0	
Time Before Reduce (s)		15.0								0.0	0.0	
Time To Reduce (s)		45.0								0.0	0.0	
Recall Mode		C-Max								None	None	
Act Effct Green (s)		160.7								9.3	8.3	
Actuated g/C Ratio		0.89								0.05	0.05	
v/c Ratio		0.65								0.34	0.49	
Control Delay		3.8								33.4	105.7	
Queue Delay		0.0								0.0	0.0	
Total Delay		3.8								33.4	105.7	
LOS		A								C	F	

UNC DP TIA 2023 — Existing (2023) AM
108: US 15/501 NB & SB/WB U-Turn — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		3.8									58.3	
Approach LOS		A									E	
Queue Length 50th (ft)		105								9	50	
Queue Length 95th (ft)		128								34	m98	
Internal Link Dist (ft)		1106			684			182			106	
Turn Bay Length (ft)												
Base Capacity (vph)		3159								623	300	
Starvation Cap Reductn		0								0	0	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.65								0.13	0.14	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 6.8 — Intersection LOS: A
Intersection Capacity Utilization 112.8% — ICU Level of Service H
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 108: US 15/501 NB & SB/WB U-Turn



Existing (2023) AM.syn VHB

UNC DP TIA 2023 — Existing (2023) AM
109: Old Durham-CH Road/Sage Road & US 15/501 — Lanes, Volumes, Timings

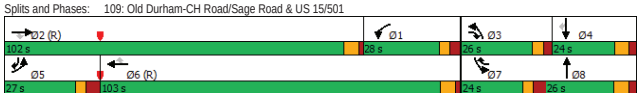
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	254	1191	100	92	1384	127	184	114	21	201	101	112
Future Volume (vph)	254	1191	100	92	1384	127	184	114	21	201	101	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	240		100	220		200	100		0	150		100
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor							1.00	1.00		1.00		0.99
Frt			0.850			0.850		0.977				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3505	1568	1752	3505	1568	1752	1797	0	3400	1845	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	3505	1568	1752	3505	1568	1744	1797	0	3385	1845	1545
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			95		4				95
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		829			1831			1573			1089	
Travel Time (s)		12.6			27.7			30.6			21.2	
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	282	1323	111	102	1538	141	204	127	23	223	112	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	282	1323	111	102	1538	141	204	150	0	223	112	124
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	25.0	89.0	25.0	20.0	65.0	25.0	25.0	25.0		25.0	25.0	25.0
Total Split (s)	27.0	102.0	26.0	28.0	103.0	24.0	26.0	26.0		24.0	24.0	27.0
Total Split (%)	15.0%	56.7%	14.4%	15.6%	57.2%	13.3%	14.4%	14.4%		13.3%	13.3%	15.0%
Maximum Green (s)	20.1	96.3	20.1	21.7	96.9	17.3	20.1	19.4		17.3	17.6	20.1
Yellow Time (s)	3.0	4.4	3.0	3.0	4.5	3.0	3.0	4.1		3.0	4.1	3.0
All-Red Time (s)	3.9	1.3	2.9	3.3	1.6	3.7	2.9	2.5		3.7	2.3	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.9	5.7	5.9	6.3	6.1	6.7	5.9	6.6		6.7	6.4	6.9
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	4.0	1.0	6.0	1.0	4.0	4.0		1.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	15.0	0.0	0.0	15.0	0.0	0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	45.0	0.0	0.0	45.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	17.6	99.1	119.0	21.7	102.2	123.0	20.1	19.2		14.7	14.8	31.9

UNC DP TIA 2023 — Existing (2023) AM
109: Old Durham-CH Road/Sage Road & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.10	0.55	0.66	0.12	0.57	0.68	0.11	0.11		0.08	0.08	0.18
v/c Ratio	0.85	0.69	0.11	0.48	0.77	0.13	1.05	0.77		0.80	0.74	0.35
Control Delay	95.9	26.0	2.6	66.5	20.9	2.1	150.2	100.7		102.2	107.8	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	95.9	26.0	2.6	66.5	20.9	2.1	150.2	100.7		102.2	107.8	18.5
LOS	F	C	A	E	C	A	F	F		F	F	B
Approach Delay		36.0			22.1			129.2			81.0	
Approach LOS		D			C			F			F	
Queue Length 50th (ft)	164	727	24	114	754	32	~260	169		135	130	27
Queue Length 95th (ft)	221	683	21	m182	773	14	#441	#283		184	205	88
Internal Link Dist (ft)		749			1751			1493			1009	
Turn Bay Length (ft)	240		100	220		200	100			150		100
Base Capacity (vph)	379	1930	1057	211	1989	1122	195	202		326	180	374
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.74	0.69	0.11	0.48	0.77	0.13	1.05	0.74		0.68	0.62	0.33

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 110 (61%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 160
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 42.7 — Intersection LOS: D
Intersection Capacity Utilization 82.6% — ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 109: Old Durham-CH Road/Sage Road & US 15/501



Existing (2023) AM.syn VHB

UNC DP TIA 2023 — Existing (2023) AM
110: BCBS/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

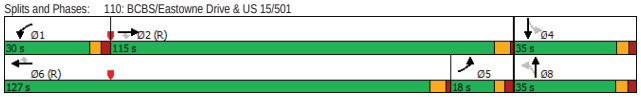
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	1312	10	38	1554	203	3	15	7	47	4	41
Future Volume (vph)	128	1312	10	38	1554	203	3	15	7	47	4	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220		100	220		250	100		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98	1.00				0.99	
Frt			0.850			0.850		0.952			0.862	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1756	0	1752	1570	0
Flt Permitted	0.950			0.950			0.724			0.741		
Satd. Flow (perm)	1752	3505	1568	1752	3505	1536	1333	1756	0	1367	1570	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			54			167		8			46	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		1831			1555			278			606	
Travel Time (s)		27.7			23.6			7.6			16.5	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	142	1458	11	42	1727	226	3	17	8	52	4	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	142	1458	11	42	1727	226	3	25	0	52	50	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	19.0	127.0	127.0	17.0	108.0	108.0	36.0	36.0		36.0	36.0	
Total Split (s)	18.0	115.0	115.0	30.0	127.0	127.0	35.0	35.0		35.0	35.0	
Total Split (%)	10.0%	63.9%	63.9%	16.7%	70.6%	70.6%	19.4%	19.4%		19.4%	19.4%	
Maximum Green (s)	12.2	109.3	109.3	24.2	121.1	121.1	28.9	28.9		29.1	29.1	
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.3	3.3		3.6	3.6	
All-Red Time (s)	2.8	1.1	1.1	2.8	1.3	1.3	2.8	2.8		2.3	2.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.8	5.7	5.7	5.8	5.9	5.9	6.1	6.1		5.9	5.9	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	6.0	1.0	6.0	6.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	50.0	50.0	0.0	50.0	50.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Walk Time (s)										7.0	7.0	

UNC DP TIA 2023 — Existing (2023) AM
110: BCBS/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)										23.0	23.0	
Pedestrian Calls (#/hr)										2	2	
Act Effct Green (s)	12.2	142.0	142.0	8.5	135.6	135.6	14.4	14.4		14.6	14.6	
Actuated g/C Ratio	0.07	0.79	0.79	0.05	0.75	0.75	0.08	0.08		0.08	0.08	
v/c Ratio	1.20	0.53	0.01	0.51	0.65	0.19	0.03	0.17		0.47	0.30	
Control Delay	191.7	2.0	0.0	118.8	4.3	0.4	70.3	56.7		90.3	23.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	191.7	2.0	0.0	118.8	4.3	0.4	70.3	56.7		90.3	23.9	
LOS	F	A	A	F	A	A	E	E		F	C	
Approach Delay		18.7			6.3			58.2			57.7	
Approach LOS		B			A			E			E	
Queue Length 50th (ft)	~206	51	0	47	220	3	3	19		61	5	
Queue Length 95th (ft)	m#367	159	m0	m67	262	12	14	50		103	48	
Internal Link Dist (ft)		1751			1475			198			526	
Turn Bay Length (ft)	220		100	220		250	100					
Base Capacity (vph)	118	2765	1248	235	2641	1198	214	288		220	292	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	1.20	0.53	0.01	0.18	0.65	0.19	0.01	0.09		0.24	0.17	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 100 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.20
Intersection Signal Delay: 13.4 — Intersection LOS: B
Intersection Capacity Utilization 74.5% — ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 110: BCBS/Eastowne Drive & US 15/501



Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
111: Lakeview Drive/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	1362	3	84	1797	268	6	30	83	70	5	6
Future Volume (vph)	8	1362	3	84	1797	268	6	30	83	70	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		125	0		0	150		0	200		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850		0.890			0.919	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	5036	0	1752	3505	1568	1752	1642	0	1752	1695	0
Flt Permitted	0.950			0.950			0.749			0.434		
Satd. Flow (perm)	1752	5036	0	1752	3505	1568	1382	1642	0	801	1695	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						155		75			7	
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		1555			959			495			676	
Travel Time (s)		23.6			14.5			9.6			18.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	9	1513	3	93	1997	298	7	33	92	78	6	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	1516	0	93	1997	298	7	125	0	78	13	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	92.0		30.0	80.0	80.0	30.0	30.0		30.0	30.0	
Total Split (s)	15.0	79.0		49.0	113.0	113.0	52.0	52.0		52.0	52.0	
Total Split (%)	8.3%	43.9%		27.2%	62.8%	62.8%	28.9%	28.9%		28.9%	28.9%	
Maximum Green (s)	9.4	73.5		43.2	107.5	107.5	45.8	45.8		45.9	45.9	
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	3.2	3.2		3.1	3.1	
All-Red Time (s)	2.6	1.0		2.8	1.0	1.0	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.5		5.8	5.5	5.5	6.2	6.2		6.1	6.1	
Lead/Lag	Lag	Lag		Lead	Lead	Lead						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0		1.0	6.0	6.0	1.0	1.0		2.0	2.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	45.0		0.0	45.0	45.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	8.0	132.8		13.0	145.7	145.7	16.6	16.6		16.7	16.7	
Actuated g/C Ratio	0.04	0.74		0.07	0.81	0.81	0.09	0.09		0.09	0.09	
v/c Ratio	0.12	0.41		0.74	0.70	0.23	0.06	0.57		1.05	0.08	
Control Delay	76.4	10.5		112.3	11.5	3.1	71.3	41.7		194.9	45.9	

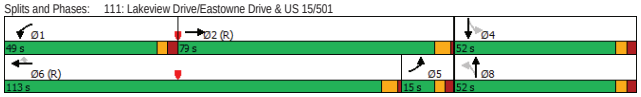
Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
111: Lakeview Drive/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	76.4	10.5		112.3	11.5	3.1	71.3	41.7		194.9	45.9	
LOS	E	B		F	B	A	E	D		F	D	
Approach Delay		10.9			14.3			43.3			173.6	
Approach LOS		B			B			D			F	
Queue Length 50th (ft)	10	189		110	378	24	8	56		~100	7	
Queue Length 95th (ft)	m18	280		174	862	87	24	126		#181	31	
Internal Link Dist (ft)		1475			879			415			596	
Turn Bay Length (ft)	150						150			200		
Base Capacity (vph)	91	3715		420	2836	1298	351	473		204	437	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.10	0.41		0.22	0.70	0.23	0.02	0.26		0.38	0.03	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 106 (59%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 17.5 — Intersection LOS: B
Intersection Capacity Utilization 80.4% — ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 111: Lakeview Drive/Eastowne Drive & US 15/501



Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
201: Hamilton Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1556	86	37	1934	25	128	25	57	59	33	26
Future Volume (vph)	24	1556	86	37	1934	25	128	25	57	59	33	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-4%			2%			-2%	
Storage Length (ft)	200		0	200		0	0		150	100		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.98		0.98	0.99	0.98	
Frt		0.992			0.998				0.850		0.934	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	4987	0	1805	5175	0	1752	1844	1567	1787	1730	0
Flt Permitted	0.057			0.085			0.714			0.739		
Satd. Flow (perm)	105	4987	0	162	5175	0	1288	1844	1535	1379	1730	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		9			2							
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		895			935			499			486	
Travel Time (s)		13.6			14.2			9.7			9.5	
Confl. Peds. (#/hr)	3		2	2		3	19		7	7		19
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	27	1729	96	41	2149	28	142	28	63	66	37	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	1825	0	41	2177	0	142	28	63	66	66	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	6			2			8		8	4		
Detector Phase	5	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	12.6	28.7		12.4	25.9		41.0	41.0	12.4	39.6	39.6	
Total Split (s)	15.0	80.0		18.0	83.0		42.0	42.0	18.0	42.0	42.0	
Total Split (%)	10.7%	57.1%		12.9%	59.3%		30.0%	30.0%	12.9%	30.0%	30.0%	
Maximum Green (s)	9.4	74.3		12.6	77.3		35.7	35.7	12.6	35.4	35.4	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.7	3.7	3.0	3.2	3.2	
All-Red Time (s)	2.6	1.7		2.4	1.7		2.6	2.6	2.4	3.4	3.4	
Lost Time Adjust (s)	-0.6	-0.6		-0.4	-0.9		-1.4	-1.4	-0.4	-1.5	-1.5	
Total Lost Time (s)	5.0	5.1		5.0	4.8		4.9	4.9	5.0	5.1	5.1	
Lead/Lag	Lead	Lead		Lag	Lag				Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		2.0	3.0		1.0	1.0	2.0	1.0	1.0	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		16.0			13.0		27.0	27.0		26.0	26.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	106.7	93.6		105.7	102.3		20.4	20.4	33.7	20.2	20.2	
Actuated g/C Ratio	0.76	0.67		0.76	0.73		0.15	0.15	0.24	0.14	0.14	
v/c Ratio	0.16	0.55		0.15	0.58		0.76	0.10	0.17	0.33	0.27	

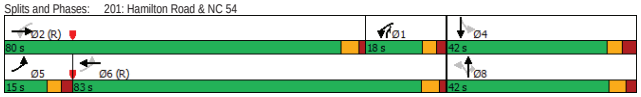
UNC DP TIA 2023 — Existing (2023) AM
201: Hamilton Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	6.6	15.2		5.4	7.0		80.9	49.4	35.1	56.2	53.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	6.6	15.2		5.4	7.0		80.9	49.4	35.1	56.2	53.7	
LOS	A	B		A	A		F	D	D	E	D	
Approach Delay		15.1			7.0			64.7			54.9	
Approach LOS		B			A			E			D	
Queue Length 50th (ft)	5	315		7	194		126	22	43	55	54	
Queue Length 95th (ft)	15	480		10	134		191	49	69	97	95	
Internal Link Dist (ft)		815			855			419			406	
Turn Bay Length (ft)	200			200					150	100		
Base Capacity (vph)	198	3338		307	3782		341	488	396	363	455	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.14	0.55		0.13	0.58		0.42	0.06	0.16	0.18	0.15	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 23 (16%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 14.8 — Intersection LOS: B
Intersection Capacity Utilization 64.4% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 201: Hamilton Road & NC 54



UNC DP TIA 2023 — Existing (2023) AM
202: Finley Golf Course Road/Burning Tree Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1595	42	174	1914	22	20	5	116	25	5	36
Future Volume (vph)	19	1595	42	174	1914	22	20	5	116	25	5	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	12	12	12	10	10	10
Storage Length (ft)	200		0	100		0	460		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99	0.99		0.98	
Frt		0.996			0.998				0.850		0.927	
Flt Protected	0.950			0.950				0.962			0.981	
Satd. Flow (prot)	1770	5062	0	1770	4904	0	0	1792	1583	0	1558	0
Flt Permitted	0.068			0.084				0.643			0.864	
Satd. Flow (perm)	127	5062	0	156	4904	0	0	1187	1563	0	1371	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			2				71		40	
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		651			853			632			471	
Travel Time (s)		9.9			12.9			12.3			9.2	
Confl. Peds. (#/hr)	3		2	2		3	12		1	1		12
Confl. Bikes (#/hr)												3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	21	1772	47	193	2127	24	22	6	129	28	6	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	1819	0	193	2151	0	0	28	129	0	74	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	6			2			8		8	4		
Detector Phase	5	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	12.9	31.2		12.9	29.2		47.2	47.2	12.9	45.3	45.3	
Total Split (s)	20.0	74.0		18.0	72.0		48.0	48.0	18.0	48.0	48.0	
Total Split (%)	14.3%	52.9%		12.9%	51.4%		34.3%	34.3%	12.9%	34.3%	34.3%	
Maximum Green (s)	14.1	67.8		12.1	65.8		41.8	41.8	12.1	41.7	41.7	
Yellow Time (s)	3.0	4.9		3.0	4.9		3.7	3.7	3.0	3.2	3.2	
All-Red Time (s)	2.9	1.3		2.9	1.3		2.5	2.5	2.9	3.1	3.1	
Lost Time Adjust (s)	-0.9	-1.2		-0.9	-1.2			-1.2	-0.9		-1.3	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lead		Lag	Lag				Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0	2.0	2.0	2.0	
Minimum Gap (s)	0.2	3.0		0.2	3.0		0.2	0.2	0.2	0.2	0.2	
Time Before Reduce (s)	0.0	20.0		0.0	20.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	40.0		0.0	40.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		7.0			7.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		18.0			16.0		34.0	34.0		32.0	32.0	

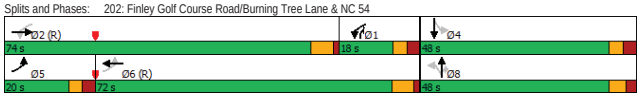
UNC DP TIA 2023 — Existing (2023) AM
202: Finley Golf Course Road/Burning Tree Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	119.3	93.5		117.3	115.5			10.4	32.5		10.4	
Actuated g/C Ratio	0.85	0.67		0.84	0.82			0.07	0.23		0.07	
v/c Ratio	0.10	0.54		0.48	0.53			0.32	0.31		0.54	
Control Delay	1.6	8.0		28.0	6.2			70.0	20.0		45.8	
Queue Delay	0.0	0.1		0.0	0.2			0.0	0.0		0.0	
Total Delay	1.6	8.0		28.0	6.3			70.0	20.0		45.8	
LOS	A	A		C	A			E	C		D	
Approach Delay		7.9			8.1			28.9			45.8	
Approach LOS		A			A			C			D	
Queue Length 50th (ft)	1	108		55	253			25	42		30	
Queue Length 95th (ft)	m2	167		143	344			57	93		81	
Internal Link Dist (ft)		571			773			552			391	
Turn Bay Length (ft)	200			100								
Base Capacity (vph)	286	3381		404	4046			364	421		448	
Starvation Cap Reductn	0	260		0	760			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.07	0.58		0.48	0.65			0.08	0.31		0.17	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 29 (21%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 9.4 — Intersection LOS: A
Intersection Capacity Utilization 73.5% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 202: Finley Golf Course Road/Burning Tree Lane & NC 54



UNC DP TIA 2023 — Existing (2023) AM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	1456	43	59	1996	33	16	0	1	8	1	109
Future Volume (vph)	140	1456	43	59	1996	33	16	0	1	8	1	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	250		250	0		125	0		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.96			0.97						
Frt			0.850			0.850		0.850			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1583	0	1770	1585	0
Flt Permitted	0.058			0.130			0.377			0.757		
Satd. Flow (perm)	108	5085	1519	242	5085	1541	702	1583	0	1410	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			69			137		168			121	
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		853			1936			433			831	
Travel Time (s)		12.9			29.3			11.8			16.2	
Confl. Peds. (#/hr)	7		5	5		7						
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	156	1618	48	66	2218	37	18	0	1	9	1	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	1618	48	66	2218	37	18	1	0	9	122	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6		2	2		6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.3	27.3	27.3	13.3	18.3	18.3	13.8	13.8		14.3	14.3	
Total Split (s)	20.0	91.0	91.0	20.0	91.0	91.0	29.0	29.0		29.0	29.0	
Total Split (%)	12.0%	54.5%	54.5%	12.0%	54.5%	54.5%	17.4%	17.4%		17.4%	17.4%	
Maximum Green (s)	13.7	84.7	84.7	13.7	84.7	84.7	22.2	22.2		21.7	21.7	
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.0	3.0		3.5	3.5	
All-Red Time (s)	3.3	1.6	1.6	3.3	1.6	1.6	3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.8	-1.8		-2.3	-2.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag					Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	6.0	1.0	6.0	6.0	2.0	2.0		2.0	2.0	
Minimum Gap (s)	0.2	3.0	3.0	0.2	3.0	3.0	0.2	0.2		0.2	0.2	
Time Before Reduce (s)	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	40.0	40.0	0.0	40.0	40.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		14.0	14.0									
Pedestrian Calls (#/hr)		0	0									

UNC DP TIA 2023 — Existing (2023) AM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	27.0
Total Split (s)	27.0
Total Split (%)	16%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0

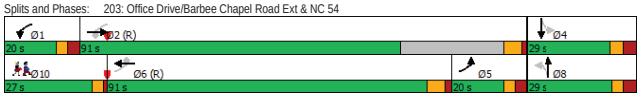
UNC DP TIA 2023 — Existing (2023) AM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	141.4	133.1	133.1	141.4	126.3	126.3	10.6	10.6		10.6	10.6	
Actuated g/C Ratio	0.85	0.80	0.80	0.85	0.76	0.76	0.06	0.06		0.06	0.06	
v/c Ratio	0.65	0.40	0.04	0.24	0.58	0.03	0.40	0.00		0.10	0.57	
Control Delay	48.0	5.5	0.4	3.5	9.9	0.1	100.2	0.0		74.9	22.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	48.0	5.5	0.4	3.5	9.9	0.1	100.2	0.0		74.9	22.2	
LOS	D	A	A	A	A	A	F	A		E	C	
Approach Delay		9.0			9.5			95.0			25.8	
Approach LOS		A			A			F			C	
Queue Length 50th (ft)	68	160	0	6	352	0	19	0		10	1	
Queue Length 95th (ft)	157	211	5	16	415	0	49	0		30	68	
Internal Link Dist (ft)		773			1856			353			751	
Turn Bay Length (ft)	250		250	250		250						
Base Capacity (vph)	254	4051	1224	349	3845	1198	100	371		202	331	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.61	0.40	0.04	0.19	0.58	0.03	0.18	0.00		0.04	0.37	

Intersection Summary

Area Type: Other
Cycle Length: 167
Actuated Cycle Length: 167
Offset: 22 (13%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 10.2 — Intersection LOS: B
Intersection Capacity Utilization 66.4% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 203: Office Drive/Barbee Chapel Road Ext & NC 54



UNC DP TIA 2023 — Existing (2023) AM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	Ø10
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — Existing (2023) AM
204: Friday Center Lane/Meadowmont Lane & NC 54 — Lanes, Volumes, Timings

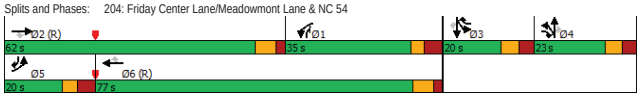
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	1310	111	383	1965	125	53	29	23	61	19	136
Future Volume (vph)	153	1310	111	383	1965	125	53	29	23	61	19	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	12	12	12	12	12	12	12	12	12
Storage Length (ft)	250		250	250		250	0		400	225		0
Storage Lanes	2		1	2		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	1.00	0.97	1.00	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	0.98	0.99	0.98	0.98		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.985		0.950		
Satd. Flow (prot)	3433	5085	1478	3433	5085	1583	1681	1743	1583	3433	1863	1583
Flt Permitted	0.950			0.950			0.950	0.985		0.950		
Satd. Flow (perm)	3430	5085	1447	3426	5085	1546	1651	1733	1556	3379	1863	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			123			130			141			139
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1936			1043			1237			723	
Travel Time (s)		29.3			15.8			24.1			14.1	
Confl. Peds. (#/hr)	9		6	6		9	8		6	6		8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	170	1456	123	426	2183	139	59	32	26	68	21	151
Shared Lane Traffic (%)							24%					
Lane Group Flow (vph)	170	1456	123	426	2183	139	45	46	26	68	21	151
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2	4	1	6	3	4	4	1	3	3	5
Permitted Phases			2			6			4			3
Detector Phase	5	2	4	1	6	3	4	4	1	3	3	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.2	34.6	14.1	14.1	38.5	14.3	14.1	14.1	14.1	14.3	14.3	14.2
Total Split (s)	20.0	62.0	23.0	35.0	77.0	20.0	23.0	23.0	35.0	20.0	20.0	20.0
Total Split (%)	14.3%	44.3%	16.4%	25.0%	55.0%	14.3%	16.4%	16.4%	25.0%	14.3%	14.3%	14.3%
Maximum Green (s)	12.8	55.4	15.9	27.9	70.5	12.7	15.9	15.9	27.9	12.7	12.7	12.8
Yellow Time (s)	3.2	4.6	3.7	3.1	4.4	4.0	3.7	3.7	3.1	4.0	4.0	3.2
All-Red Time (s)	4.0	2.0	3.4	4.0	2.1	3.3	3.4	3.4	4.0	3.3	3.3	4.0
Lost Time Adjust (s)	-2.2	-1.6	-2.1	-2.1	-1.5	-2.3	-2.1	-2.1	-2.1	-2.3	-2.3	-2.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Time Before Reduce (s)	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	C-Min	None	None	C-Min	Min	None	None	None	Min	Min	Min
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		21.0			25.0							
Pedestrian Calls (#/hr)		0			0							

UNC DP TIA 2023 — Existing (2023) AM
204: Friday Center Lane/Meadowmont Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	12.6	67.3	77.5	32.9	87.6	97.2	10.2	10.2	43.1	9.6	9.6	22.2
Actuated g/C Ratio	0.09	0.48	0.55	0.24	0.63	0.69	0.07	0.07	0.31	0.07	0.07	0.16
v/c Ratio	0.55	0.60	0.14	0.53	0.69	0.12	0.37	0.36	0.04	0.29	0.17	0.41
Control Delay	67.6	28.2	2.4	49.4	19.2	1.6	70.0	69.5	0.1	65.2	64.4	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.6	28.2	2.4	49.4	19.2	1.6	70.0	69.5	0.1	65.2	64.4	10.2
LOS	E	C	A	D	B	A	E	E	A	E	E	B
Approach Delay		30.2			23.0			54.3			30.5	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	77	371	0	165	439	2	42	43	0	30	18	8
Queue Length 95th (ft)	114	400	26	237	579	23	85	87	0	56	47	56
Internal Link Dist (ft)		1856			963			1157			643	
Turn Bay Length (ft)	250		250	250		250			400	225		
Base Capacity (vph)	372	2443	907	826	3181	1171	216	224	591	367	199	392
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.60	0.14	0.52	0.69	0.12	0.21	0.21	0.04	0.19	0.11	0.39

Intersection Summary
Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 103 (74%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 26.7 — Intersection LOS: C
Intersection Capacity Utilization 65.6% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 204: Friday Center Lane/Meadowmont Lane & NC 54



UNC DP TIA 2023 — Existing (2023) AM
205: Barbee Chapel Road & NC 54 — Lanes, Volumes, Timings

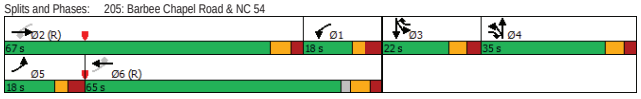
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	1186	183	52	1861	160	510	73	55	105	27	21
Future Volume (vph)	17	1186	183	52	1861	160	510	73	55	105	27	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		275	325		80	250		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Ped Bike Factor			0.95			0.98						
Frt			0.850			0.850		0.974			0.959	
Flt Protected	0.950			0.950			0.950	0.971		0.950	0.982	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1681	1674	0	1681	1667	0
Flt Permitted	0.059			0.102			0.950	0.971		0.950	0.982	
Satd. Flow (perm)	110	5085	1511	190	5085	1546	1681	1674	0	1681	1667	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			203			85		7			11	
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		1043			982			1263			745	
Travel Time (s)		15.8			14.9			19.1			14.5	
Confl. Peds. (#/hr)	1		7	7		1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	19	1318	203	58	2068	178	567	81	61	117	30	23
Shared Lane Traffic (%)							37%			27%		
Lane Group Flow (vph)	19	1318	203	58	2068	178	357	352	0	85	85	0
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	Split	NA		Split	NA	
Protected Phases	5	2	4	1	6	3	4	4		3	3	
Permitted Phases	6		2	2		6						
Detector Phase	5	2	4	1	6	3	4	4		3	3	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.8	26.5	14.2	14.0	28.5	14.2	14.2	14.2		14.2	14.2	
Total Split (s)	18.0	67.0	35.0	18.0	65.0	22.0	35.0	35.0		22.0	22.0	
Total Split (%)	12.7%	47.2%	24.6%	12.7%	45.8%	15.5%	24.6%	24.6%		15.5%	15.5%	
Maximum Green (s)	11.2	59.5	27.8	11.0	57.5	14.8	27.8	27.8		14.8	14.8	
Yellow Time (s)	3.0	4.8	4.3	3.0	4.8	3.9	4.3	4.3		3.9	3.9	
All-Red Time (s)	3.8	2.7	2.9	4.0	2.7	3.3	2.9	2.9		3.3	3.3	
Lost Time Adjust (s)	-1.8	-2.5	-2.2	-2.0	-2.5	-2.2	-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0	3.0	2.0	6.0	2.0	3.0	3.0		2.0	2.0	
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2		0.2	0.2	
Time Before Reduce (s)	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min	None	None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		12.0			14.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	76.7	58.6	92.4	75.7	71.5	84.9	33.8	33.8		13.5	13.5	

UNC DP TIA 2023 — Existing (2023) AM
205: Barbee Chapel Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.54	0.41	0.65	0.53	0.50	0.60	0.24	0.24		0.10	0.10	
v/c Ratio	0.12	0.63	0.19	0.19	0.81	0.19	0.89	0.87		0.53	0.51	
Control Delay	15.4	35.8	1.5	25.4	33.7	6.3	77.6	73.6		73.1	63.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	15.4	35.8	1.5	25.4	33.7	6.3	77.6	73.6		73.1	63.1	
LOS	B	D	A	C	C	A	E	E		E	E	
Approach Delay		31.0			31.4			75.6			68.1	
Approach LOS		C			C			E			E	
Queue Length 50th (ft)	7	380	0	23	619	35	340	327		80	69	
Queue Length 95th (ft)	20	401	27	45	689	65	#573	#554		137	127	
Internal Link Dist (ft)		963			902			1183			665	
Turn Bay Length (ft)	275		275	325		80	250					
Base Capacity (vph)	213	2340	1071	320	2558	999	400	403		201	209	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.09	0.56	0.19	0.18	0.81	0.18	0.89	0.87		0.42	0.41	

Intersection Summary
Area Type: Other
Cycle Length: 142
Actuated Cycle Length: 142
Offset: 99 (70%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 39.2 — Intersection LOS: D
Intersection Capacity Utilization 79.3% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 205: Barbee Chapel Road & NC 54



UNC DP TIA 2023 — Existing (2023) AM
208: Environ Way/Rogerson Dr & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1624	60	60	2024	0	0	0	22	0	0	3
Future Volume (vph)	0	1624	60	60	2024	0	0	0	22	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-4%			0%			0%	
Storage Length (ft)	0		100	250		0	0		0	0		0
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.98
Frt			0.850						0.865			0.865
Flt Protected				0.950								
Satd. Flow (prot)	0	5085	1583	1805	5187	0	0	0	1611	0	0	1611
Flt Permitted				0.108								
Satd. Flow (perm)	0	5085	1583	205	5187	0	0	0	1611	0	0	1577
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			72						386			72
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		935			651			374			582	
Travel Time (s)		14.2			9.9			8.5			13.2	
Confl. Peds. (#/hr)	2		1	1		2	3		2	2		3
Confl. Bikes (#/hr)						1						1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1804	67	67	2249	0	0	0	24	0	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1804	67	67	2249	0	0	0	24	0	0	3
Turn Type		NA	Prot	D.P+P	NA				custom			Perm
Protected Phases		2	2	1	6							
Permitted Phases				2								4
Detector Phase		2	2	1	6							4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0							7.0
Minimum Split (s)		30.6	30.6	31.6	16.6							22.6
Total Split (s)		86.0	86.0	25.0	111.0							29.0
Total Split (%)		61.4%	61.4%	17.9%	79.3%							20.7%
Maximum Green (s)		79.4	79.4	19.4	104.4							22.4
Yellow Time (s)		4.0	4.0	3.0	4.0							4.0
All-Red Time (s)		2.6	2.6	2.6	2.6							2.6
Lost Time Adjust (s)		-1.6	-1.6	-0.6	-1.6							-1.6
Total Lost Time (s)		5.0	5.0	5.0	5.0							5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		2.0	2.0	2.0	2.0							2.0
Recall Mode		C-Max	C-Max	None	C-Min							None
Walk Time (s)		7.0	7.0	7.0								7.0
Flash Dont Walk (s)		17.0	17.0	19.0								9.0
Pedestrian Calls (#/hr)		0	0	0								0
Act Effct Green (s)		123.1	123.1	128.3	136.3				0.0			8.6
Actuated g/C Ratio		0.88	0.88	0.92	0.97				0.00			0.06

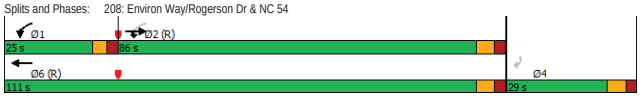
UNC DP TIA 2023 — Existing (2023) AM
208: Environ Way/Rogerson Dr & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.40	0.05	0.24	0.45				0.06			0.02
Control Delay		1.2	0.1	2.6	0.4				0.3			0.3
Queue Delay		0.0	0.0	0.0	0.0				0.0			0.0
Total Delay		1.2	0.1	2.6	0.5				0.3			0.3
LOS		A	A	A	A				A			A
Approach Delay		1.1			0.5			0.3			0.3	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		24	0	0	0				0			0
Queue Length 95th (ft)		23	0	6	45				0			0
Internal Link Dist (ft)		855			571			294			502	
Turn Bay Length (ft)			100	250								
Base Capacity (vph)		4472	1401	422	5049				386			330
Starvation Cap Reductn		0	0	0	57				0			0
Spillback Cap Reductn		0	0	0	0				0			0
Storage Cap Reductn		0	0	0	0				0			0
Reduced v/c Ratio		0.40	0.05	0.16	0.45				0.06			0.01

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 19 (14%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.45
Intersection Signal Delay: 0.8 — Intersection LOS: A
Intersection Capacity Utilization 54.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 208: Environ Way/Rogerson Dr & NC 54



Existing (2023) AM.syn VHB

UNC DP TIA 2023 — Existing (2023) AM
301: Columbia Street & Culbreth Road/Mt Carmel Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	203	85	43	19	81	565	40	1224	3	267	707	171
Future Volume (vph)	203	85	43	19	81	565	40	1224	3	267	707	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	200		115	380		415	100		95	491		207
Storage Lanes	1		1	0		2	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98		1.00		1.00		0.98			
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950				0.991		0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	0	1920	2898	1787	3575	1599	1752	3504	1567
Flt Permitted	0.950				0.199		0.265			0.073		
Satd. Flow (perm)	1743	1835	1532	0	385	2898	498	3575	1566	135	3504	1567
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			131			413			133			190
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		950			859			2346			550	
Travel Time (s)		18.5			16.7			45.7			10.7	
Confl. Peds. (#/hr)			1	1			2					2
Confl. Bikes (#/hr)			2			2			1			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	226	94	48	21	90	628	44	1360	3	297	786	190
Shared Lane Traffic (%)												
Lane Group Flow (vph)	226	94	48	0	111	628	44	1360	3	297	786	190
Turn Type	custom	NA	Perm	Perm	NA	Prot	Perm	NA	Perm	pm+pt	NA	Prot
Protected Phases	4	4			3	3		2		1	6	6
Permitted Phases	4		4	3			2		2	6		
Detector Phase	4	4	4	3	3	3	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	12.0	7.0	12.0	12.0
Minimum Split (s)	13.5	13.5	13.5	13.9	13.9	13.9	18.2	18.2	18.2	12.1	25.2	25.2
Total Split (s)	23.0	23.0	23.0	31.0	31.0	31.0	55.0	55.0	55.0	21.0	76.0	76.0
Total Split (%)	17.7%	17.7%	17.7%	23.8%	23.8%	23.8%	42.3%	42.3%	42.3%	16.2%	58.5%	58.5%
Maximum Green (s)	16.6	16.6	16.6	24.1	24.1	24.1	48.8	48.8	48.8	15.9	70.5	70.5
Yellow Time (s)	4.2	4.2	4.2	4.5	4.5	4.5	4.7	4.7	4.7	3.0	4.3	4.3
All-Red Time (s)	2.2	2.2	2.2	2.4	2.4	2.4	1.5	1.5	1.5	2.1	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4		6.9	6.9	6.2	6.2	6.2	5.1	5.5	5.5
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	6.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	15.0	0.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0	45.0	0.0	45.0	45.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)											7.0	7.0
Flash Dont Walk (s)											12.0	12.0

Existing (2023) AM.syn VHB

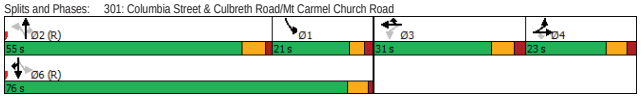
UNC DP TIA 2023 — Existing (2023) AM
301: Columbia Street & Culbreth Road/Mt Carmel Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)											0	0
Act Effct Green (s)	16.6	16.6	16.6		24.1	24.1	48.8	48.8	48.8	70.9	70.5	70.5
Actuated g/C Ratio	0.13	0.13	0.13		0.19	0.19	0.38	0.38	0.38	0.55	0.54	0.54
v/c Ratio	1.02	0.40	0.16		1.56	0.72	0.24	1.01	0.00	1.10	0.41	0.20
Control Delay	120.6	57.8	1.1		346.4	21.7	22.7	63.0	0.0	124.1	11.5	1.0
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	120.6	57.8	1.1		346.4	21.7	22.7	63.0	0.0	124.1	11.5	1.0
LOS	F	E	A		F	C	C	E	A	F	B	A
Approach Delay		89.0			70.5			61.6			36.2	
Approach LOS		F			E			E			D	
Queue Length 50th (ft)	~197	74	0		~132	95	25	~653	0	~238	166	2
Queue Length 95th (ft)	#365	131	0		#256	172	m49	#797	m0	m#426	201	m9
Internal Link Dist (ft)		870			779			2266			470	
Turn Bay Length (ft)	200		115			415	100		95	491		207
Base Capacity (vph)	222	234	309		71	873	186	1342	670	271	1900	936
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.40	0.16		1.56	0.72	0.24	1.01	0.00	1.10	0.41	0.20

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.56
Intersection Signal Delay: 57.5 — Intersection LOS: E
Intersection Capacity Utilization 81.3% — ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 301: Columbia Street & Culbreth Road/Mt Carmel Church Road



Existing (2023) AM.syn VHB

UNC DP TIA 2023 — Existing (2023) AM
302: Columbia Street & Arlen Park Drive/Bennett Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	18	6	62	17	7	3	1146	72	54	701	51
Future Volume (vph)	85	18	6	62	17	7	3	1146	72	54	701	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	350		350	350		350
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00		1.00	1.00		1.00		0.98	1.00		0.98
Frt		0.961			0.956				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1784	0	1770	1774	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.740			0.740			0.950			0.950		
Satd. Flow (perm)	1378	1784	0	1377	1774	0	1767	3539	1547	1766	3539	1546
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			8				90			90
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		358			1313			2727			2346	
Travel Time (s)		9.8			25.6			53.1			45.7	
Confl. Peds. (#/hr)			1	1			1		2	2		1
Confl. Bikes (#/hr)						1			2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	20	7	69	19	8	3	1273	80	60	779	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	27	0	69	27	0	3	1273	80	60	779	57
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	36.6	36.6		14.1	14.1		13.6	20.6	20.6	12.9	24.6	24.6
Total Split (s)	30.0	30.0		30.0	30.0		18.0	82.0	82.0	18.0	82.0	82.0
Total Split (%)	23.1%	23.1%		23.1%	23.1%		13.8%	63.1%	63.1%	13.8%	63.1%	63.1%
Maximum Green (s)	23.4	23.4		22.9	22.9		11.4	75.4	75.4	12.1	75.4	75.4
Yellow Time (s)	3.2	3.2		3.8	3.8		3.0	4.6	4.6	3.0	4.6	4.6
All-Red Time (s)	3.4	3.4		3.3	3.3		3.6	2.0	2.0	2.9	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		7.1	7.1		6.6	6.6	6.6	5.9	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		1.0	1.0		2.0	6.0	6.0	1.0	6.0	6.0
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	25.0	25.0	0.0	25.0	25.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	55.0	55.0	0.0	55.0	55.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	4.0	4.0									7.0	7.0
Flash Dont Walk (s)	26.0	26.0									10.0	10.0
Pedestrian Calls (#/hr)	0	0									0	0

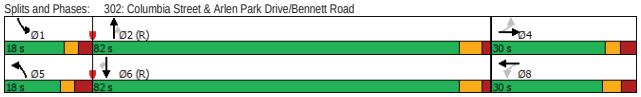
UNC DP TIA 2023 — Existing (2023) AM
302: Columbia Street & Arlen Park Drive/Bennett Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	13.3	13.3		12.8	12.8		7.0	91.6	91.6	8.6	100.8	100.8
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.05	0.70	0.70	0.07	0.78	0.78
v/c Ratio	0.67	0.14		0.51	0.15		0.03	0.51	0.07	0.52	0.28	0.05
Control Delay	77.8	42.2		67.4	41.2		58.3	12.1	2.6	106.7	1.6	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.8	42.2		67.4	41.2		58.3	12.1	2.6	106.7	1.6	0.1
LOS	E	D		E	D		E	B	A	F	A	A
Approach Delay		69.9			60.0			11.6			8.5	
Approach LOS		E			E			B			A	
Queue Length 50th (ft)	78	16		56	15		2	289	4	54	10	0
Queue Length 95th (ft)	132	44		102	43		m5	370	27	m96	m18	m0
Internal Link Dist (ft)		278			1233			2647			2266	
Turn Bay Length (ft)	150			150			350		350	350		350
Base Capacity (vph)	248	326		242	319		155	2494	1116	164	2743	1218
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.08		0.29	0.08		0.02	0.51	0.07	0.37	0.28	0.05

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 58 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 15.2 — Intersection LOS: B
Intersection Capacity Utilization 65.3% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 302: Columbia Street & Arlen Park Drive/Bennett Road



Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
303: Columbia Street & Market Street — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	205	41	147	924	5	469	301
Future Volume (vph)	205	41	147	924	5	469	301
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0	350		250		350
Storage Lanes	1	1	1		1		1
Taper Length (ft)	25		25		25		
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Frt		0.850					0.850
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1770	1583	1770	3539	1770	3539	1583
Flt Permitted	0.950		0.950		0.279		
Satd. Flow (perm)	1770	1583	1770	3539	520	3539	1583
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		46					334
Link Speed (mph)	25			35		35	
Link Distance (ft)	416			1017		2727	
Travel Time (s)	11.3			19.8		53.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	228	46	163	1027	6	521	334
Shared Lane Traffic (%)							
Lane Group Flow (vph)	228	46	163	1027	6	521	334
Turn Type	Prot	Perm	Prot	NA	Perm	NA	Perm
Protected Phases	4		5	2		6	
Permitted Phases		4			6		6
Detector Phase	4	4	5	2	6	6	6
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	12.0
Minimum Split (s)	14.1	14.1	12.8	20.4	20.0	20.0	20.0
Total Split (s)	26.0	26.0	16.0	39.0	23.0	23.0	23.0
Total Split (%)	40.0%	40.0%	24.6%	60.0%	35.4%	35.4%	35.4%
Maximum Green (s)	19.9	19.9	10.2	32.6	17.0	17.0	17.0
Yellow Time (s)	3.0	3.0	3.0	5.0	4.6	4.6	4.6
All-Red Time (s)	3.1	3.1	2.8	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	5.8	6.4	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	1.0	6.0	6.0	6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	45.0	45.0	45.0	45.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	13.6	13.6	9.3	38.9	24.2	24.2	24.2
Actuated g/C Ratio	0.21	0.21	0.14	0.60	0.37	0.37	0.37
v/c Ratio	0.62	0.13	0.64	0.48	0.03	0.40	0.42
Control Delay	30.2	7.2	38.0	9.0	13.4	14.7	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.2	7.2	38.0	9.0	13.4	14.7	10.2

Existing (2023) AM.syn — VHB

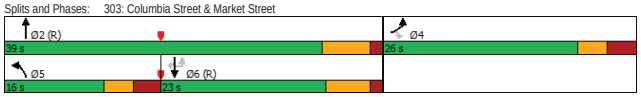
UNC DP TIA 2023 — Existing (2023) AM
303: Columbia Street & Market Street — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
LOS	C	A	D	A	B	B	B
Approach Delay	26.3			13.0		12.9	
Approach LOS	C			B		B	
Queue Length 50th (ft)	82	0	62	106	2	160	143
Queue Length 95th (ft)	132	21	113	183	m8	212	229
Internal Link Dist (ft)	336			937		2647	
Turn Bay Length (ft)	150		350		250		350
Base Capacity (vph)	541	516	290	2120	193	1317	799
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.09	0.56	0.48	0.03	0.40	0.42

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 58 (89%), Referenced to phase 2:NBT and 6:SBTU, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 14.5 — Intersection LOS: B
Intersection Capacity Utilization 62.3% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 303: Columbia Street & Market Street



Existing (2023) AM.syn — VHB

UNC DP TIA 2023 — Existing (2023) AM
305: Boundary Street & Park Place — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	33	3	30	6	4	83
Future Volume (vph)	33	3	30	6	4	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.990		0.976			
Flt Protected	0.956					0.998
Satd. Flow (prot)	1763	0	1818	0	0	1859
Flt Permitted	0.956					0.998
Satd. Flow (perm)	1763	0	1818	0	0	1859
Link Speed (mph)	25		25			25
Link Distance (ft)	398		535			551
Travel Time (s)	10.9		14.6			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	37	3	33	7	4	92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	40	0	40	0	0	96
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 17.6% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
305: Boundary Street & Park Place — HCM 2010 TWSC

Intersection

Int Delay, s/veh 2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	33	3	30	6	4	83
Future Vol, veh/h	33	3	30	6	4	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	3	33	7	4	92

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	137	37	0	0	40	0
Stage 1	37	-	-	-	-	-
Stage 2	100	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	856	1035	-	-	1570	-
Stage 1	985	-	-	-	-	-
Stage 2	924	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	853	1035	-	-	1570	-
Mov Cap-2 Maneuver	853	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	921	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	866	1570	-
HCM Lane V/C Ratio	-	-	0.046	0.003	-
HCM Control Delay (s)	-	-	9.4	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

UNC DP TIA 2023 — Existing (2023) AM
307: Country Club Road & Boundary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	345	365	0	0	55
Future Volume (vph)	0	345	365	0	0	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	0	1611
Link Speed (mph)		25	25		30	
Link Distance (ft)		312	90		92	
Travel Time (s)		8.5	2.5		2.1	
Confl. Peds. (#/hr)						9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	383	406	0	0	61
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	383	406	0	0	61
Sign Control		Free	Free		Yield	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 32.6% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
313: Ridge Road & Country Club Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	159	485	5	20	132	35
Future Volume (vph)	159	485	5	20	132	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.898				0.972	
Flt Protected				0.989	0.962	
Satd. Flow (prot)	1673	0	0	1842	1742	0
Flt Permitted				0.989	0.962	
Satd. Flow (perm)	1673	0	0	1842	1742	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	215			564	517	
Travel Time (s)	4.2			11.0	10.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	177	539	6	22	147	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	716	0	0	28	186	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 54.3% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
313: Ridge Road & Country Club Road — HCM 2010 TWSC

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	159	485	5	20	132	35
Future Vol, veh/h	159	485	5	20	132	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	177	539	6	22	147	39

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	716	0	481	447
Stage 1	-	-	-	-	447	-
Stage 2	-	-	-	-	34	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	885	-	544	612
Stage 1	-	-	-	-	644	-
Stage 2	-	-	-	-	988	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	885	-	540	612
Mov Cap-2 Maneuver	-	-	-	-	540	-
Stage 1	-	-	-	-	644	-
Stage 2	-	-	-	-	981	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	14.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	554	-	-	885	-
HCM Lane V/C Ratio	0.335	-	-	0.006	-
HCM Control Delay (s)	14.7	-	-	9.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0	-

UNC DP TIA 2023 — Existing (2023) AM
325: Columbia Street & Pittsboro Street — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	317	0	614	57	0
Future Volume (vph)	0	317	0	614	57	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			0%	4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	1825	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	1825	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	384			956	267	
Travel Time (s)	8.7			26.1	7.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	352	0	682	63	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	352	0	682	63	0
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.6%		ICU Level of Service A	
Analysis Period (min) 15			

UNC DP TIA 2023 — Existing (2023) AM
329: Pittsboro Street & Manning Drive — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	412	317
Future Volume (vph)	0	0	0	0	412	317
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt						
Flt Protected					0.950	0.993
Satd. Flow (prot)	0	0	0	0	1681	1757
Flt Permitted					0.950	0.993
Satd. Flow (perm)	0	0	0	0	1681	1757
Link Speed (mph)	25		30			25
Link Distance (ft)	218		384			1147
Travel Time (s)	5.9		8.7			31.3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	458	352
Shared Lane Traffic (%)					13%	
Lane Group Flow (vph)	0	0	0	0	398	412
Sign Control	Free		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.1%		ICU Level of Service A	
Analysis Period (min) 15			

UNC DP TIA 2023 — Existing (2023) AM
350: Fordham Blvd & Oteys Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2372	1279	37	0	16
Future Volume (vph)	0	2372	1279	37	0	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	10	10
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.996			0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3525	0	0	1504
Flt Permitted						
Satd. Flow (perm)	0	3539	3525	0	0	1504
Link Speed (mph)		45	45		25	
Link Distance (ft)		2437	1661		324	
Travel Time (s)		36.9	25.2		8.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2636	1421	41	0	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2636	1462	0	0	18
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 68.9%		ICU Level of Service C	
Analysis Period (min) 15			

UNC DP TIA 2023 — Existing (2023) AM
350: Fordham Blvd & Oteys Road — HCM 2010 TWSC

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2372	1279	37	0	16
Future Vol, veh/h	0	2372	1279	37	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2636	1421	41	0	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	731
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	364
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	-	-	-	-	-	364
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.4
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	364
HCM Lane V/C Ratio	-	-	-	0.049
HCM Control Delay (s)	-	-	-	15.4
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.2

UNC DP TIA 2023 — Existing (2023) AM
357: Fordham Blvd & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2010	700	0	0	264
Future Volume (vph)	0	2010	700	0	0	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3539	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	0	0	1611
Link Speed (mph)		45	45		25	
Link Distance (ft)		1088	445		1226	
Travel Time (s)		16.5	6.7		33.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2233	778	0	0	293
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2233	778	0	0	293
Sign Control		Free	Free		Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		

UNC DP TIA 2023 — Existing (2023) AM
358: NC 54 EB Ramps & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1363	647	0	700	0	0
Future Volume (vph)	1363	647	0	700	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.952					
Flt Protected						
Satd. Flow (prot)	3369	0	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	3369	0	0	3539	0	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	445			1758	975	
Travel Time (s)	6.7			26.6	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1514	719	0	778	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2233	0	0	778	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	106.8%	ICU Level of Service	G
Analysis Period (min)	15		

UNC DP TIA 2023 — Existing (2023) AM
359: Columbia Street & NC 54 EB Ramps — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	878	948	0	1119
Future Volume (vph)	0	0	878	948	0	1119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt			0.922			
Flt Protected						
Satd. Flow (prot)	0	0	3263	0	0	3539
Flt Permitted						
Satd. Flow (perm)	0	0	3263	0	0	3539
Link Speed (mph)	35		25			25
Link Distance (ft)	424		550			219
Travel Time (s)	8.3		15.0			6.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	976	1053	0	1243
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	2029	0	0	1243
Sign Control	Free		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	61	0	0	948	0	0
Future Volume (vph)	61	0	0	948	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	1863	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	1863	0	0
Link Speed (mph)	30			35	30	
Link Distance (ft)	270			424	706	
Travel Time (s)	6.1			8.3	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	68	0	0	1053	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	68	0	0	1053	0	0
Sign Control	Free			Yield	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 59.9% ICU Level of Service B
Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1363	0	0	700	0	1009
Future Volume (vph)	1363	0	0	700	0	1009
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1611
Link Speed (mph)	45			45	30	
Link Distance (ft)	1758			301	706	
Travel Time (s)	26.6			4.6	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1514	0	0	778	0	1121
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1514	0	0	778	0	1121
Sign Control	Free			Free	Yield	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 106.8% ICU Level of Service G
Analysis Period (min) 15

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2372	700	595	0	0
Future Volume (vph)	0	2372	700	595	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			250	0	0
Storage Lanes	0			1	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3539	3539	1583	0	0
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	1583	0	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		301	2437		1188	
Travel Time (s)		4.6	36.9		32.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2636	778	661	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2636	778	661	0	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 68.9% ICU Level of Service C
Analysis Period (min) 15

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	293	1658	0	0	0	0
Future Volume (vph)	293	1658	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	3400	3505	0	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3400	3505	0	0	0	0
Link Speed (mph)		30	45		30	
Link Distance (ft)		605	492		205	
Travel Time (s)		13.8	7.5		4.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	326	1842	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	326	1842	0	0	0	0
Sign Control		Free	Free		Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 100.7% ICU Level of Service G
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
1052: SB/WB U-Turn & US 15/501 SB — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	72	1972	0	0
Future Volume (vph)	0	0	72	1972	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	250		0	0
Storage Lanes		0	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00
Frt						
Flt Protected			0.950			
Satd. Flow (prot)	0	0	3433	3539	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	3433	3539	0	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	1322			777	186	
Travel Time (s)	20.0			11.8	4.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	80	2191	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	80	2191	0	0
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 74.7% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
5001: US 15/501/US 15/501 SB & US 15/501 NB — Lanes, Volumes, Timings

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	0	1016	0	1032	0	0
Future Volume (vph)	0	1016	0	1032	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	0	2787	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	0	2787	0	3539	0	0
Link Speed (mph)	45			45	45	
Link Distance (ft)	811			1322	1186	
Travel Time (s)	12.3			20.0	18.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1129	0	1147	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1129	0	1147	0	0
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 38.9% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) AM
5002: US 15/501 SB/US 15/501 — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1663	0	1658
Future Volume (vph)	0	0	0	1663	0	1658
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.88
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	0	2787
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	0	2787
Link Speed (mph)	45			45	45	
Link Distance (ft)	295			829	492	
Travel Time (s)	4.5			12.6	7.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1848	0	1842
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1848	0	1842
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 61.3% — ICU Level of Service B
Analysis Period (min) 15

INTERSECTION LEVEL OF SERVICE WORKSHEETS
EXISTING (2023) PM

UNC DP TIA 2023 — Existing (2023) PM
1: Columbia Street & Rosemary Street — Lanes, Volumes, Timings

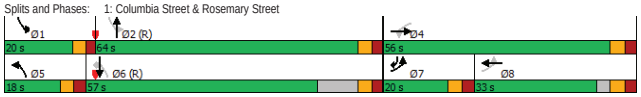
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	13	150	22	9	24	148	428	27	18	319	176
Future Volume (vph)	188	13	150	22	9	24	148	428	27	18	319	176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	0		0	0		0	125		0	0		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			50			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.93	0.90		0.93	0.94		0.73	0.97		0.82		0.50
Frt		0.862			0.891			0.991				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1433	1298	0	1486	1306	0	1433	2712	0	1433	2867	1378
Flt Permitted	0.733			0.570			0.518			0.425		
Satd. Flow (perm)	1028	1298	0	830	1306	0	574	2712	0	523	2867	693
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		167			27			6				196
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		783			945			370			503	
Travel Time (s)		21.4			25.8			10.1			13.7	
Confl. Peds. (#/hr)	46		59	59		46	111		129	129		111
Confl. Bikes (#/hr)			2			2			15			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)								0				
Adj. Flow (vph)	209	14	167	24	10	27	164	476	30	20	354	196
Shared Lane Traffic (%)												
Lane Group Flow (vph)	209	181	0	24	37	0	164	506	0	20	354	196
Turn Type	D.P+P	NA		D.Pm	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		4	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.8	31.0		31.0	32.0		12.8	22.8		12.1	21.8	12.8
Total Split (s)	20.0	56.0		56.0	33.0		18.0	64.0		20.0	57.0	20.0
Total Split (%)	14.3%	40.0%		40.0%	23.6%		12.9%	45.7%		14.3%	40.7%	14.3%
Maximum Green (s)	14.2	50.0		50.0	27.0		12.2	58.2		14.9	51.2	14.2
Yellow Time (s)	3.0	3.2		3.2	3.2		3.0	3.3		3.0	3.3	3.0
All-Red Time (s)	2.8	2.8		2.8	2.8		2.8	2.5		2.1	2.5	2.8
Lost Time Adjust (s)	-0.8	-0.8		-1.0	-1.0		-0.8	-0.8		0.1	0.1	-0.8
Total Lost Time (s)	5.0	5.2		5.0	5.0		5.0	5.0		5.2	5.9	5.0
Lead/Lag	Lead				Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Recall Mode	None	Ped		Ped	Ped		None	C-Max		None	C-Max	None
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)		18.0		18.0	19.0			10.0			9.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	41.5	46.3		46.5	27.0		78.5	76.2		80.2	65.8	81.2

UNC DP TIA 2023 — Existing (2023) PM
1: Columbia Street & Rosemary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.30	0.33		0.33	0.19		0.56	0.54		0.57	0.47	0.58
v/c Ratio	0.60	0.33		0.09	0.14		0.42	0.34		0.06	0.26	0.35
Control Delay	45.8	7.7		33.1	22.5		11.9	17.2		12.4	23.7	3.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.8		0.0	0.0	0.0
Total Delay	45.8	7.8		33.1	22.5		11.9	18.0		12.4	23.7	3.6
LOS	D	A		C	C		B	B		B	C	A
Approach Delay		28.2			26.7			16.5			16.4	
Approach LOS		C			C			B			B	
Queue Length 50th (ft)	148	9		15	7		75	172		7	101	0
Queue Length 95th (ft)	227	65		38	40		m99	m208		19	146	33
Internal Link Dist (ft)		703			865			290			423	
Turn Bay Length (ft)							125					
Base Capacity (vph)	351	577		302	310		413	1479		407	1348	559
Starvation Cap Reductn	0	0		0	0		0	645		0	0	0
Spillback Cap Reductn	0	5		0	0		0	0		0	63	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.60	0.32		0.08	0.12		0.40	0.61		0.05	0.28	0.35

Intersection Summary
Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 19.5 — Intersection LOS: B
Intersection Capacity Utilization 61.7% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Columbia Street & Rosemary Street



Existing (2023) PM.syn VHB

UNC DP TIA 2023 — Existing (2023) PM
2: Columbia Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	447	67	126	414	204	53	279	98	214	223	64
Future Volume (vph)	114	447	67	126	414	204	53	279	98	214	223	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	0		0	250		0	600		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.86	0.95		0.83	0.88		0.80	0.90		0.80	0.93	
Frt		0.981			0.950			0.961			0.967	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1433	2973	0	1486	2476	0	1433	2582	0	1433	2574	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1231	2973	0	1238	2476	0	1144	2582	0	1147	2574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			64			31			28	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		795			952			972			370	
Travel Time (s)		21.7			26.0			26.5			10.1	
Confl. Peds. (#/hr)	331		338	338		331	196		308	308		196
Confl. Bikes (#/hr)			4			9			17			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	127	497	74	140	460	227	59	310	109	238	248	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	127	571	0	140	687	0	59	419	0	238	319	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.4	28.2		12.9	28.2		12.9	27.9		12.9	27.7	
Total Split (s)	23.0	47.0		27.0	51.0		16.0	31.0		35.0	50.0	
Total Split (%)	16.4%	33.6%		19.3%	36.4%		11.4%	22.1%		25.0%	35.7%	
Maximum Green (s)	17.6	40.8		21.1	44.8		10.1	25.1		29.1	44.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.3		3.0	3.1	
All-Red Time (s)	2.4	3.2		2.9	3.2		2.9	2.6		2.9	2.6	
Lost Time Adjust (s)	-0.4	-1.2		-0.9	-1.2		-0.9	-0.9		-0.9	-0.7	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	Ped		None	Ped	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	15.2	51.6		17.0	53.4		9.6	25.2		26.3	44.4	
Actuated g/C Ratio	0.11	0.37		0.12	0.38		0.07	0.18		0.19	0.32	

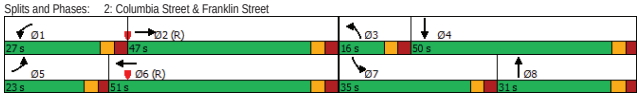
Existing (2023) PM.syn VHB

UNC DP TIA 2023 — Existing (2023) PM
2: Columbia Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.82	0.52		0.78	0.70		0.60	0.86		0.89	0.38	
Control Delay	97.1	37.8		86.9	39.2		63.7	49.3		77.8	38.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		1.0	0.0	
Total Delay	97.1	37.8		86.9	39.2		63.7	49.3		78.8	38.8	
LOS	F	D		F	D		E	D		E	D	
Approach Delay		48.6			47.3			51.1			55.9	
Approach LOS		D			D			D			E	
Queue Length 50th (ft)	114	218		125	268		38	197		213	131	
Queue Length 95th (ft)	#202	298		196	358		m58	m#260		#329	166	
Internal Link Dist (ft)		715			872			892			290	
Turn Bay Length (ft)				250			600			125		
Base Capacity (vph)	184	1103		233	983		112	508		307	852	
Starvation Cap Reductn	0	0		0	0		0	0		9	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.69	0.52		0.60	0.70		0.53	0.82		0.80	0.37	

Intersection Summary
Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 50.2 — Intersection LOS: D
Intersection Capacity Utilization 78.1% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Columbia Street & Franklin Street



Existing (2023) PM.syn VHB

UNC DP TIA 2023 — Existing (2023) PM
3: Raleigh Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	550	205	45	591	253	120	279	58	134	245	25
Future Volume (vph)	36	550	205	45	591	253	120	279	58	134	245	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	10	9	10	11	12	12	12	10	10	10
Storage Length (ft)	100		0	100		0	0		0	150		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96			0.92			0.97		0.98	0.98	
Frt		0.959			0.955			0.983			0.986	
Flt Protected	0.950			0.950				0.987		0.950		
Satd. Flow (prot)	1433	2635	0	1433	2608	0	0	1613	0	1486	1518	0
Flt Permitted	0.189			0.232				0.770		0.422		
Satd. Flow (perm)	285	2635	0	350	2608	0	0	1235	0	649	1518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71			88			12			7	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1179			1100			994			364	
Travel Time (s)		32.2			30.0			27.1			9.9	
Confl. Peds. (#/hr)	57		29	29		57	95		34	34		95
Confl. Bikes (#/hr)			7									1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	40	611	228	50	657	281	133	310	64	149	272	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	839	0	50	938	0	0	507	0	149	300	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		D.Pm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		6	6		7	4		4	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	19.8	19.8		19.8	19.8		8.0	20.0		20.0	20.0	
Total Split (s)	41.0	41.0		41.0	41.0		8.0	49.0		49.0	41.0	
Total Split (%)	45.6%	45.6%		45.6%	45.6%		8.9%	54.4%		54.4%	45.6%	
Maximum Green (s)	36.2	36.2		36.2	36.2		4.0	45.0		45.0	37.0	
Yellow Time (s)	3.3	3.3		3.1	3.1		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.7	1.7		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	-0.1	-0.1		-0.1	-0.1			-0.6		-1.2	-1.2	
Total Lost Time (s)	4.7	4.7		4.7	4.7			3.4		2.8	2.8	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)	4.0	4.0		4.0	4.0			5.0		5.0	5.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)	38.7	38.7		38.7	38.7			43.2		43.8	43.8	
Actuated g/C Ratio	0.43	0.43		0.43	0.43			0.48		0.49	0.49	

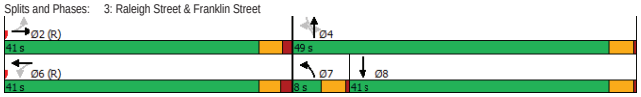
UNC DP TIA 2023 — Existing (2023) PM
3: Raleigh Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.33	0.72		0.33	0.80			0.85		0.47	0.40	
Control Delay	28.1	24.2		26.6	27.5			34.5		20.5	15.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	28.1	24.2		26.6	27.5			34.5		20.5	15.7	
LOS	C	C		C	C			C		C	B	
Approach Delay		24.3			27.4			34.5			17.3	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	16	196		20	231			220		50	94	
Queue Length 95th (ft)	47	270		55	#347			#417		106	156	
Internal Link Dist (ft)		1099			1020			914			284	
Turn Bay Length (ft)	100			100						150		
Base Capacity (vph)	122	1175		150	1174			632		334	750	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.33	0.71		0.33	0.80			0.80		0.45	0.40	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 26.1 — Intersection LOS: C
Intersection Capacity Utilization 95.8% — ICU Level of Service F
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Raleigh Street & Franklin Street



UNC DP TIA 2023 — Existing (2023) PM
4: Merritt Mill Road & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lane Configurations							
Traffic Volume (vph)	305	187	137	164	65	276	
Future Volume (vph)	305	187	137	164	65	276	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	14	15	15	9	12	
Storage Length (ft)	0	250		0	25		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	0.94	0.80	0.99				
Frt		0.850	0.926				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1699	1520	1688	0	1433	1676	
Flt Permitted	0.950				0.431		
Satd. Flow (perm)	1604	1224	1688	0	650	1676	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		208	50				
Link Speed (mph)	25		25			25	
Link Distance (ft)	1645		945			1000	
Travel Time (s)	44.9		25.8			27.3	
Confl. Peds. (#/hr)	35	50					
Confl. Bikes (#/hr)		121		1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	339	208	152	182	72	307	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	339	208	334	0	72	307	
Turn Type	Prot	pm+ov	NA		D.P+P	NA	
Protected Phases	3	1	2		1	6	4
Permitted Phases		3			2		
Detector Phase	3	1	2		1	6	
Switch Phase							
Minimum Initial (s)	7.0	7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.1	11.6	14.9		11.6	14.9	25.0
Total Split (s)	43.0	13.0	39.0		13.0	52.0	25.0
Total Split (%)	35.8%	10.8%	32.5%		10.8%	43.3%	21%
Maximum Green (s)	37.9	8.4	34.1		8.4	47.1	22.0
Yellow Time (s)	3.0	3.0	3.1		3.0	3.1	3.0
All-Red Time (s)	2.1	1.6	1.8		1.6	1.8	0.0
Lost Time Adjust (s)	0.1	0.4	0.1		0.4	0.4	
Total Lost Time (s)	5.2	5.0	5.0		5.0	5.3	
Lead/Lag	Lead	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Vehicle Extension (s)	1.0	2.0	3.0		2.0	3.0	0.2
Recall Mode	None	None	Min		None	Min	None
Walk Time (s)							7.0
Flash Dont Walk (s)							15.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	15.9	23.3	16.3		23.5	28.4	
Actuated g/C Ratio	0.29	0.42	0.29		0.42	0.51	

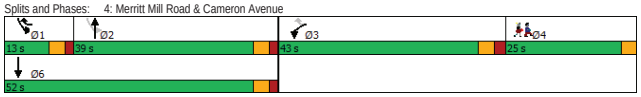
UNC DP TIA 2023 — Existing (2023) PM
4: Merritt Mill Road & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
v/c Ratio	0.69	0.31	0.63		0.19	0.36	
Control Delay	26.3	2.9	20.8		9.5	10.4	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	26.3	2.9	20.8		9.5	10.4	
LOS	C	A	C		A	B	
Approach Delay	17.4		20.8			10.2	
Approach LOS	B		C			B	
Queue Length 50th (ft)	93	0	75		11	53	
Queue Length 95th (ft)	209	29	182		36	133	
Internal Link Dist (ft)	1565		865			920	
Turn Bay Length (ft)		250			25		
Base Capacity (vph)	1214	703	1103		408	1429	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.28	0.30	0.30		0.18	0.21	

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 55.3
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 16.2 — Intersection LOS: B
Intersection Capacity Utilization 56.4% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Merritt Mill Road & Cameron Avenue



UNC DP TIA 2023 — Existing (2023) PM
5: Pittsboro Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø4
Lane Configurations								
Traffic Volume (vph)	147	152	458	371	0	0		
Future Volume (vph)	147	152	458	371	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	12	11	12	12	12		
Storage Length (ft)		0	0		0	0		
Storage Lanes		0	2		0	0		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00		
Ped Bike Factor	0.98		0.99					
Frt	0.931							
Flt Protected			0.950					
Satd. Flow (prot)	1536	0	2987	1676	0	0		
Flt Permitted			0.950					
Satd. Flow (perm)	1536	0	2956	1676	0	0		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)	70							
Link Speed (mph)	25			25	25			
Link Distance (ft)	1117			376	564			
Travel Time (s)	30.5			10.3	15.4			
Confl. Peds. (#/hr)		4	4		74	1		
Confl. Bikes (#/hr)		18						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Adj. Flow (vph)	163	169	509	412	0	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	332	0	509	412	0	0		
Turn Type	NA		Prot	NA				
Protected Phases	2		1 4	6			1	4
Permitted Phases								
Detector Phase	2		1 4	6				
Switch Phase								
Minimum Initial (s)	10.0			10.0			7.0	7.0
Minimum Split (s)	16.2			15.0			12.1	20.0
Total Split (s)	42.0			70.0			28.0	20.0
Total Split (%)	46.7%			77.8%			31%	22%
Maximum Green (s)	36.8			65.0			22.9	16.0
Yellow Time (s)	3.1			3.3			3.0	3.0
All-Red Time (s)	2.1			1.7			2.1	1.0
Lost Time Adjust (s)	-0.2			0.0				
Total Lost Time (s)	5.0			5.0				
Lead/Lag	Lead						Lag	
Lead-Lag Optimize?								
Vehicle Extension (s)	1.0			1.0			4.0	0.2
Recall Mode	Min			Min			None	None
Walk Time (s)	7.0							7.0
Flash Dont Walk (s)	4.0							9.0
Pedestrian Calls (#/hr)	0							0
Act Effct Green (s)	14.1		23.8	31.7				
Actuated g/C Ratio	0.29		0.49	0.66				

Existing (2023) PM.syn — VHB

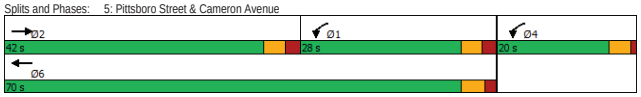
UNC DP TIA 2023 — Existing (2023) PM
5: Pittsboro Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø4
v/c Ratio	0.66		0.35	0.37				
Control Delay	19.1		8.8	4.5				
Queue Delay	0.0		0.0	0.0				
Total Delay	19.1		8.8	4.5				
LOS	B		A	A				
Approach Delay	19.1			6.9				
Approach LOS	B			A				
Queue Length 50th (ft)	60		38	38				
Queue Length 95th (ft)	146		85	66				
Internal Link Dist (ft)	1037			296	484			
Turn Bay Length (ft)								
Base Capacity (vph)	1223		2046	1676				
Starvation Cap Reductn	0		0	252				
Spillback Cap Reductn	0		0	0				
Storage Cap Reductn	0		0	0				
Reduced v/c Ratio	0.27		0.25	0.29				

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 48.1
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 10.1 — Intersection LOS: B
Intersection Capacity Utilization 49.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Pittsboro Street & Cameron Avenue



Existing (2023) PM.syn — VHB

UNC DP TIA 2023 — Existing (2023) PM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	122	0	0	189	42	199	462	63	103	0	408
Future Volume (vph)	19	122	0	0	189	42	199	462	63	103	0	408
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	10	10	10	11	11	12
Storage Length (ft)	110		0	0		0	0		0	300		0
Storage Lanes	1		0	0		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.95	1.00	1.00	0.88
Ped Bike Factor	0.89				0.95		0.59	0.92		0.74		0.42
Frt					0.975			0.983				0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1540	1676	0	0	1556	0	1353	2598	0	1540	0	2508
Flt Permitted	0.262						0.950	0.998		0.950		
Satd. Flow (perm)	376	1676	0	0	1556	0	796	2559	0	1146	0	1047
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)					7			10				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		376			2112			887			972	
Travel Time (s)		10.3			57.6			24.2			26.5	
Confl. Peds. (#/hr)	132		360	360		132	245		165	165		245
Confl. Bikes (#/hr)			9			35			12			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	21	136	0	0	210	47	221	513	70	114	0	453
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	21	136	0	0	257	0	199	605	0	114	0	453
Turn Type	Perm	NA			NA		Split	NA		Prot		Prot
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Detector Phase	4	4			8		2	2		1		1
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		7.0	7.0		7.0		7.0
Minimum Split (s)	27.1	27.1			30.2		23.2	23.2		25.6		25.6
Total Split (s)	31.0	31.0			31.0		47.0	47.0		33.0		33.0
Total Split (%)	22.1%	22.1%			22.1%		33.6%	33.6%		23.6%		23.6%
Maximum Green (s)	24.9	24.9			24.8		40.8	40.8		27.4		27.4
Yellow Time (s)	3.1	3.1			3.2		3.1	3.1		3.0		3.0
All-Red Time (s)	3.0	3.0			3.0		3.1	3.1		2.6		2.6
Lost Time Adjust (s)	-1.2	-1.2			-1.2		-1.2	-1.2		-0.6		-0.6
Total Lost Time (s)	4.9	4.9			5.0		5.0	5.0		5.0		5.0
Lead/Lag							Lag	Lag		Lead		Lead
Lead-Lag Optimize?							Yes	Yes		Yes		Yes
Vehicle Extension (s)	2.0	2.0			2.0		4.0	4.0		4.0		4.0
Recall Mode	Min	Min			Min		C-Max	C-Max		None		None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0		7.0
Flash Dont Walk (s)	10.0	10.0			17.0		5.0	5.0		13.0		13.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0		0
Act Effct Green (s)	25.1	25.1			25.0		43.6	43.6		28.4		28.4
Actuated g/C Ratio	0.18	0.18			0.18		0.31	0.31		0.20		0.20

Existing (2023) PM.syn — VHB

UNC DP TIA 2023 — Existing (2023) PM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	29.0
Total Split (%)	21%
Maximum Green (s)	25.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	0.2
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	

Existing (2023) PM.syn — VHB

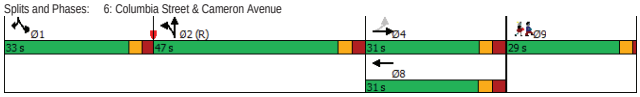
UNC DP TIA 2023 — Existing (2023) PM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.31	0.45			0.91		0.47	0.74		0.37		0.89
Control Delay	63.2	56.4			89.1		44.2	49.4		52.8		73.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		0.0
Total Delay	63.2	56.4			89.1		44.2	49.4		52.8		73.3
LOS	E	E			F		D	D		D		E
Approach Delay		57.3			89.1			48.1			69.2	
Approach LOS		E			F			D			E	
Queue Length 50th (ft)	17	111			224		163	271		102		239
Queue Length 95th (ft)	46	180			#383		253	350		169		#336
Internal Link Dist (ft)		296			2032			807			892	
Turn Bay Length (ft)	110									300		
Base Capacity (vph)	70	312			294		421	816		317		515
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		0
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.30	0.44			0.87		0.47	0.74		0.36		0.88

Intersection Summary

Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 5 (4%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 61.5 — Intersection LOS: E
Intersection Capacity Utilization 72.4% — ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Columbia Street & Cameron Avenue



UNC DP TIA 2023 — Existing (2023) PM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	Ø9
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — Existing (2023) PM
7: Raleigh Street & Cameron Avenue/Country Club Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	164	46	30	134	293	62	128	56	283	161	58
Future Volume (vph)	33	164	46	30	134	293	62	128	56	283	161	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	9	11	11	10	10	10	10	12	12
Storage Length (ft)	0		0	100		0	100		0	75		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			100			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96			0.87		0.66	0.88		0.85	0.87	
Frt		0.974			0.897			0.954			0.960	
Flt Protected		0.993		0.950			0.950			0.950		
Satd. Flow (prot)	0	1565	0	1433	1268	0	1486	1314	0	1486	1401	0
Flt Permitted		0.887		0.405			0.608			0.393		
Satd. Flow (perm)	0	1385	0	611	1268	0	626	1314	0	520	1401	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					118			16			17	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2112			312			770			994	
Travel Time (s)		57.6			8.5			21.0			27.1	
Confl. Peds. (#/hr)	42		40	40		42	112		86	86		112
Confl. Bikes (#/hr)			8			2			11			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	37	182	51	33	149	326	69	142	62	314	179	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	270	0	33	475	0	69	204	0	314	243	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.1	21.1		12.6	21.6		12.3	21.3		11.9	19.1	
Total Split (s)	45.4	45.4		12.6	58.0		12.6	28.0		34.0	49.4	
Total Split (%)	37.8%	37.8%		10.5%	48.3%		10.5%	23.3%		28.3%	41.2%	
Maximum Green (s)	39.3	39.3		7.0	52.4		7.3	22.7		29.1	44.3	
Yellow Time (s)	3.3	3.3		3.0	3.1		3.0	3.1		3.0	3.1	
All-Red Time (s)	2.8	2.8		2.6	2.5		2.3	2.2		1.9	2.0	
Lost Time Adjust (s)		-1.1		-0.6	-0.6		-0.3	-0.3		0.1	-0.1	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	Min	Min		None	Min		None	None		None	None	
Walk Time (s)	7.0	7.0			7.0			7.0			7.0	
Flash Dont Walk (s)	8.0	8.0			8.0			7.0			7.0	
Pedestrian Calls (#/hr)	0	0			0			0			0	
Act Effct Green (s)		25.5		31.8	31.8		25.5	17.3		43.6	34.2	
Actuated g/C Ratio		0.29		0.37	0.37		0.29	0.20		0.50	0.40	

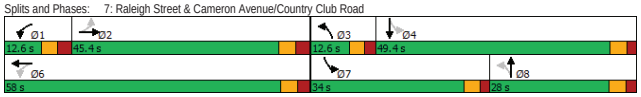
UNC DP TIA 2023 — Existing (2023) PM
7: Raleigh Street & Cameron Avenue/Country Club Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.66		0.11	0.88		0.26	0.74		0.64	0.43	
Control Delay		39.0		19.9	38.6		19.7	51.9		22.2	24.5	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		39.0		19.9	38.6		19.7	51.9		22.2	24.5	
LOS		D		B	D		B	D		C	C	
Approach Delay		39.0			37.4			43.8			23.2	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)		143		11	186		20	101		109	97	
Queue Length 95th (ft)		264		35	384		56	#260		237	210	
Internal Link Dist (ft)		2032			232			690			914	
Turn Bay Length (ft)				100			100			75		
Base Capacity (vph)		718		304	884		270	399		628	805	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.38		0.11	0.54		0.26	0.51		0.50	0.30	

Intersection Summary

Area Type: CBD
Cycle Length: 120
Actuated Cycle Length: 86.5
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 33.8 — Intersection LOS: C
Intersection Capacity Utilization 88.1% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Raleigh Street & Cameron Avenue/Country Club Road



UNC DP TIA 2023 — Existing (2023) PM
8: Pittsboro Street & McCauley Street/South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	78	20	232	219	0	0	0	0	179	428	29
Future Volume (vph)	0	78	20	232	219	0	0	0	0	179	428	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			50			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor		0.97		0.87							0.95	
Frt		0.973									0.993	
Flt Protected				0.950							0.986	
Satd. Flow (prot)	0	1419	0	1593	1676	0	0	0	0	0	3087	0
Flt Permitted				0.687							0.986	
Satd. Flow (perm)	0	1419	0	998	1676	0	0	0	0	0	2971	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22									9	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1050			519			1147			237	
Travel Time (s)		28.6			14.2			31.3			6.5	
Confl. Peds. (#/hr)	86		112	112		86	101		67	67		101
Confl. Bikes (#/hr)			2			26			6			7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)		0	0									
Adj. Flow (vph)	0	87	22	258	243	0	0	0	0	199	476	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	109	0	258	243	0	0	0	0	0	707	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		22.8		23.6	23.6					23.3	23.3	
Total Split (s)		30.8		30.8	30.8					29.2	29.2	
Total Split (%)		51.3%		51.3%	51.3%					48.7%	48.7%	
Maximum Green (s)		26.0		25.2	25.2					23.9	23.9	
Yellow Time (s)		3.3		3.0	3.0					3.3	3.3	
All-Red Time (s)		1.5		2.6	2.6					2.0	2.0	
Lost Time Adjust (s)		-0.3		-0.3	-0.3						-0.1	
Total Lost Time (s)		4.5		5.3	5.3						5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		Ped		Ped	Ped					Ped	Ped	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		6.0		7.0	7.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		19.5		18.6	18.6						18.4	
Actuated g/C Ratio		0.41		0.39	0.39						0.38	

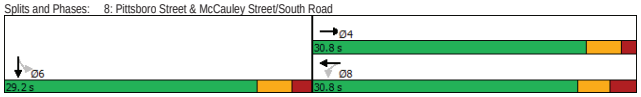
UNC DP TIA 2023 — Existing (2023) PM
8: Pittsboro Street & McCauley Street/South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.18		0.66	0.37						0.62	
Control Delay		8.9		22.2	12.7						15.1	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		8.9		22.2	12.7						15.1	
LOS		A		C	B						B	
Approach Delay		8.9			17.6						15.1	
Approach LOS		A			B						B	
Queue Length 50th (ft)		13		50	41						71	
Queue Length 95th (ft)		44		142	104						149	
Internal Link Dist (ft)		970			439			1067			157	
Turn Bay Length (ft)				100								
Base Capacity (vph)		812		547	920						1539	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.13		0.47	0.26						0.46	

Intersection Summary

Area Type: CBD
Cycle Length: 60
Actuated Cycle Length: 47.8
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 15.5 — Intersection LOS: B
Intersection Capacity Utilization 57.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 8: Pittsboro Street & McCauley Street/South Road



UNC DP TIA 2023 — Existing (2023) PM
9: Columbia Street & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	237	0	0	319	175	120	495	126	0	0	0
Future Volume (vph)	38	237	0	0	319	175	120	495	126	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	13	13	12	11	11	11	11	11
Storage Length (ft)	75		0	0		125	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.91				0.99	0.83		0.88				
Frt					0.992	0.850		0.974				
Flt Protected	0.950							0.992				
Satd. Flow (prot)	1593	1788	0	0	1619	1399	0	3904	0	0	0	0
Flt Permitted	0.950							0.992				
Satd. Flow (perm)	1451	1788	0	0	1619	1163	0	3747	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4	132		65				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		519			696			500			887	
Travel Time (s)		14.2			19.0			13.6			24.2	
Confl. Peds. (#/hr)	105		109	109		105	105		203	203		105
Confl. Bikes (#/hr)			5			24			32			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	42	263	0	0	354	194	133	550	140	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	42	263	0	0	373	175	0	823	0	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA				
Protected Phases	7	4			8			2				
Permitted Phases						8	2					
Detector Phase	7	4			8	8	2	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Minimum Split (s)	8.0	20.0			20.0	20.0	20.0	20.0				
Total Split (s)	10.0	45.0			35.0	35.0	31.0	31.0				
Total Split (%)	13.2%	59.2%			46.1%	46.1%	40.8%	40.8%				
Maximum Green (s)	6.0	41.0			31.0	31.0	27.0	27.0				
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5	3.5				
All-Red Time (s)	0.5	0.5			0.5	0.5	0.5	0.5				
Lost Time Adjust (s)	-0.6	-0.6			-0.5	-0.5		-0.9				
Total Lost Time (s)	3.4	3.4			3.5	3.5		3.1				
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Recall Mode	None	None			None	None	C-Max	C-Max				
Walk Time (s)		5.0			5.0	5.0	5.0	5.0				
Flash Dont Walk (s)		11.0			11.0	11.0	11.0	11.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	6.5	29.6			23.5	23.5		39.9				
Actuated g/C Ratio	0.09	0.39			0.31	0.31		0.52				

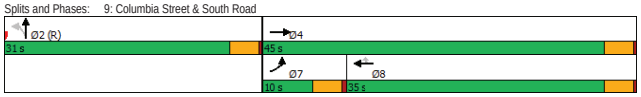
UNC DP TIA 2023 — Existing (2023) PM
9: Columbia Street & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.31	0.38			0.74	0.39		0.41				
Control Delay	39.0	16.3			31.8	8.1		13.0				
Queue Delay	0.0	0.0			0.0	0.0		0.0				
Total Delay	39.0	16.3			31.8	8.1		13.0				
LOS	D	B			C	A		B				
Approach Delay		19.5			24.2			13.0				
Approach LOS		B			C			B				
Queue Length 50th (ft)	19	78			163	14		82				
Queue Length 95th (ft)	49	102			222	52		142				
Internal Link Dist (ft)		439			616			420			807	
Turn Bay Length (ft)	75					125						
Base Capacity (vph)	138	978			673	559		1998				
Starvation Cap Reductn	0	0			0	0		0				
Spillback Cap Reductn	0	0			0	0		0				
Storage Cap Reductn	0	0			0	0		0				
Reduced v/c Ratio	0.30	0.27			0.55	0.31		0.41				

Intersection Summary

Area Type: CBD
Cycle Length: 76
Actuated Cycle Length: 76
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 17.9 — Intersection LOS: B
Intersection Capacity Utilization 57.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 9: Columbia Street & South Road



UNC DP TIA 2023 — Existing (2023) PM
10: South Road & Raleigh Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	88	303	290	86	72	144
Future Volume (vph)	88	303	290	86	72	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	11	11
Storage Length (ft)	225			190	75	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93			0.85	0.69	0.49
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	1676	1621	1378	1540	1378
Flt Permitted	0.527				0.950	
Satd. Flow (perm)	824	1676	1621	1177	1058	679
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				96		160
Link Speed (mph)		25	25		25	
Link Distance (ft)		516	1148		454	
Travel Time (s)		14.1	31.3		12.4	
Confl. Peds. (#/hr)	63			63	132	209
Confl. Bikes (#/hr)				6		4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	98	337	322	96	80	160
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	337	322	96	80	160
Turn Type	D.P+P	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	6			6		4
Detector Phase	5	2	6	6	4	5
Switch Phase						
Minimum Initial (s)	7.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	12.6	15.8	28.8	28.8	24.8	12.6
Total Split (s)	21.0	63.0	42.0	42.0	27.0	21.0
Total Split (%)	23.3%	70.0%	46.7%	46.7%	30.0%	23.3%
Maximum Green (s)	15.4	57.2	36.2	36.2	21.2	15.4
Yellow Time (s)	3.0	3.2	3.2	3.2	3.0	3.0
All-Red Time (s)	2.6	2.6	2.6	2.6	2.8	2.6
Lost Time Adjust (s)	-0.6	-0.7	-0.8	-0.8	-0.6	-0.6
Total Lost Time (s)	5.0	5.1	5.0	5.0	5.2	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Vehicle Extension (s)	1.0	3.0	1.0	1.0	2.0	1.0
Recall Mode	None	Min	Min	Min	None	None
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			16.0	16.0	12.0	
Pedestrian Calls (#/hr)			0	0	0	
Act Effct Green (s)	24.6	32.4	16.7	16.7	8.7	12.9
Actuated g/C Ratio	0.58	0.76	0.39	0.39	0.20	0.30

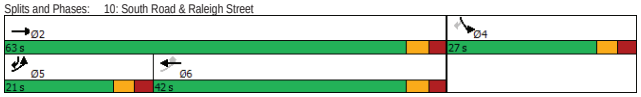
UNC DP TIA 2023 — Existing (2023) PM
10: South Road & Raleigh Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.16	0.27	0.51	0.19	0.26	0.36
Control Delay	4.8	4.7	15.4	4.3	18.8	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	4.7	15.4	4.3	18.8	4.8
LOS	A	A	B	A	B	A
Approach Delay		4.7	12.8		9.5	
Approach LOS		A	B		A	
Queue Length 50th (ft)	9	35	68	0	17	0
Queue Length 95th (ft)	25	81	142	23	52	26
Internal Link Dist (ft)		436	1068		374	
Turn Bay Length (ft)	225			190	75	
Base Capacity (vph)	877	1676	1370	1010	822	697
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.20	0.24	0.10	0.10	0.23

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 42.7
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 8.9 — Intersection LOS: A
Intersection Capacity Utilization 53.2% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 10: South Road & Raleigh Street



Existing (2023) PM.syn — VHB

UNC DP TIA 2023 — Existing (2023) PM
11: Country Club Road & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	363	39	217	334	459	21	117	271	460	101	12
Future Volume (vph)	28	363	39	217	334	459	21	117	271	460	101	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	14	12	12	14	12	15	12	11	16	12
Storage Length (ft)	0		0	200		0	0		0	75		0
Storage Lanes	1		0	1		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor	0.96	0.99		0.98		0.93		1.00	0.99	1.00	1.00	
Frt		0.986				0.850			0.850		0.994	
Flt Protected	0.950			0.950				0.993		0.950	0.970	
Satd. Flow (prot)	1711	3459	0	1770	1863	1689	0	2035	1583	1625	1929	0
Flt Permitted	0.541			0.279				0.993		0.950	0.970	
Satd. Flow (perm)	932	3459	0	507	1863	1569	0	2026	1561	1624	1928	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				301			106		2	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		362			1042			215			421	
Travel Time (s)		9.9			28.4			4.2			11.5	
Confl. Peds. (#/hr)	30		27	27		30	45		1	1		45
Confl. Bikes (#/hr)			9			1			1			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	31	403	43	241	371	510	23	130	301	511	112	13
Shared Lane Traffic (%)										38%		
Lane Group Flow (vph)	31	446	0	241	371	510	0	153	301	317	319	0
Turn Type	Perm	NA		pm+pt	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases		2		1	6	4	3	3	1	4	4	
Permitted Phases	2			6		6		3	3			
Detector Phase	2	2		1	6	4	3	3	1	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	33.1	33.1		12.1	31.1	42.0	13.6	13.6	12.1	42.0	42.0	
Total Split (s)	34.5	34.5		22.2	56.7	42.0	21.3	21.3	22.2	42.0	42.0	
Total Split (%)	28.8%	28.8%		18.5%	47.3%	35.0%	17.8%	17.8%	18.5%	35.0%	35.0%	
Maximum Green (s)	28.4	28.4		17.1	50.6	35.0	14.7	14.7	17.1	35.0	35.0	
Yellow Time (s)	3.7	3.7		3.0	3.7	3.1	3.3	3.3	3.0	3.1	3.1	
All-Red Time (s)	2.4	2.4		2.1	2.4	3.9	3.3	3.3	2.1	3.9	3.9	
Lost Time Adjust (s)	-0.7	-0.7		-0.1	-0.6	-1.7		-1.3	-0.1	-1.7	-1.7	
Total Lost Time (s)	5.4	5.4		5.0	5.5	5.3		5.3	5.0	5.3	5.3	
Lead/Lag	Lag	Lag		Lead		Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?						Yes				Yes	Yes	
Vehicle Extension (s)	3.0	3.0		1.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	
Recall Mode	Min	Min		None	Min	None	None	None	None	None	None	
Walk Time (s)	7.0	7.0			7.0	7.0				7.0	7.0	
Flash Dont Walk (s)	20.0	20.0			18.0	28.0				28.0	28.0	
Pedestrian Calls (#/hr)	0	0			0	0				0	0	
Act Effct Green (s)	18.1	18.1		36.0	35.4	59.2		12.0	24.5	23.5	23.5	
Actuated g/C Ratio	0.21	0.21		0.41	0.40	0.67		0.14	0.28	0.27	0.27	

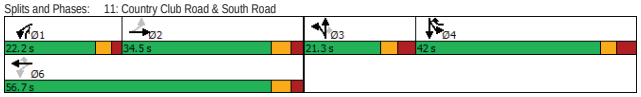
UNC DP TIA 2023 — Existing (2023) PM
11: Country Club Road & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.16	0.62		0.63	0.49	0.43		0.55	0.59	0.73	0.62	
Control Delay	35.8	37.2		27.3	23.6	2.7		47.9	14.6	41.4	35.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.1	0.1	
Total Delay	35.8	37.2		27.3	23.6	2.7		47.9	14.6	41.4	35.0	
LOS	D	D		C	C	A		D	B	D	D	
Approach Delay		37.1			14.9			25.8			38.2	
Approach LOS		D			B			C			D	
Queue Length 50th (ft)	14	115		88	147	27		79	43	164	157	
Queue Length 95th (ft)	47	210		185	292	62		179	112	320	304	
Internal Link Dist (ft)		282			962			135			341	
Turn Bay Length (ft)				200						75		
Base Capacity (vph)	325	1214		468	1145	1276		390	614	716	851	
Starvation Cap Reductn	0	0		0	0	0		0	0	26	52	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.10	0.37		0.51	0.32	0.40		0.39	0.49	0.46	0.40	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 87.9
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 26.2 — Intersection LOS: C
Intersection Capacity Utilization 74.2% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 11: Country Club Road & South Road



Existing (2023) PM.syn — VHB

UNC DP TIA 2023 — Existing (2023) PM
12: Columbia Street & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	179	0	206	0	353	0	308	39	0	0	0
Future Volume (vph)	65	179	0	206	0	353	0	308	39	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			4%			-4%			0%	
Storage Length (ft)	100		0	0		0	100		150	0		0
Storage Lanes	1		0	1		2	1		1	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.94			0.90		0.91			0.97			
Frt						0.850			0.850			
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1778	3557	0	1734	0	2731	0	3610	1615	0	0	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1675	3557	0	1564	0	2493	0	3610	1564	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	72					392			43			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		218			284			267			526	
Travel Time (s)		5.9			7.7			7.3			14.3	
Confl. Peds. (#/hr)	43		37	37		43	21		11	11		21
Confl. Bikes (#/hr)			15			11			3			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	72	199	0	229	0	392	0	342	43	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	199	0	229	0	392	0	342	43	0	0	0
Turn Type	Prot	NA		Prot		Perm		NA	pm+ov			
Protected Phases	7	4		3				2	3			
Permitted Phases						3		2	2			
Detector Phase	7	4		3		3		2	3			
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0		7.0		10.0	7.0			
Minimum Split (s)	11.9	25.6		12.9		12.9		30.0	12.9			
Total Split (s)	36.0	36.0		57.0		57.0		47.0	57.0			
Total Split (%)	25.7%	25.7%		40.7%		40.7%		33.6%	40.7%			
Maximum Green (s)	31.1	30.4		51.1		51.1		41.0	51.1			
Yellow Time (s)	3.0	3.2		3.0		3.0		3.4	3.0			
All-Red Time (s)	1.9	2.4		2.9		2.9		2.6	2.9			
Lost Time Adjust (s)	0.1	-0.6		-0.9		-0.9		-1.0	-0.9			
Total Lost Time (s)	5.0	5.0		5.0		5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0		1.0		3.0	1.0			
Recall Mode	None	None		None		None		C-Min	None			
Walk Time (s)		4.0						4.0				
Flash Dont Walk (s)		16.0						20.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	11.6	11.9		23.4		23.4		89.7	113.1			
Actuated g/C Ratio	0.08	0.08		0.17		0.17		0.64	0.81			

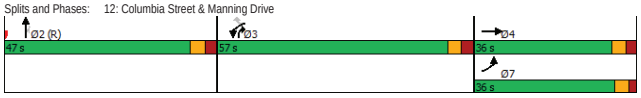
UNC DP TIA 2023 — Existing (2023) PM
12: Columbia Street & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.34	0.66		0.79		0.53		0.15	0.03			
Control Delay	15.9	71.2		74.6		6.9		11.3	0.7			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	15.9	71.2		74.6		6.9		11.3	0.7			
LOS	B	E		E		A		B	A			
Approach Delay		56.5			31.9			10.1				
Approach LOS		E			C			B				
Queue Length 50th (ft)	1	92		203		0		61	0			
Queue Length 95th (ft)	48	133		279		46		104	6			
Internal Link Dist (ft)		138			204			187			446	
Turn Bay Length (ft)	100								150			
Base Capacity (vph)	449	787		644		1172		2312	1517			
Starvation Cap Reductn	0	0		0		0		0	0			
Spillback Cap Reductn	0	0		0		0		0	0			
Storage Cap Reductn	0	0		0		0		0	0			
Reduced v/c Ratio	0.16	0.25		0.36		0.33		0.15	0.03			

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 30.5 — Intersection LOS: C
Intersection Capacity Utilization 57.4% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 12: Columbia Street & Manning Drive



UNC DP TIA 2023 — Existing (2023) PM
13: West Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	185	18	13	477	8	51	1	14	6	5	26
Future Volume (vph)	12	185	18	13	477	8	51	1	14	6	5	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			3%			0%			-3%	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			1.00			0.98			0.97	0.99
Frt		0.987			0.998			0.971				0.850
Flt Protected		0.997			0.999			0.963			0.974	
Satd. Flow (prot)	0	3494	0	0	3474	0	0	1714	0	0	1842	1607
Flt Permitted		0.927			0.947			0.767			0.858	
Satd. Flow (perm)	0	3249	0	0	3282	0	0	1366	0	0	1574	1587
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			3			16				123
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		388			334			349			293	
Travel Time (s)		7.6			6.5			9.5			8.0	
Confl. Peds. (#/hr)			107	107					66	66		
Confl. Bikes (#/hr)			7			2			1			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	206	20	14	530	9	57	1	16	7	6	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	239	0	0	553	0	0	74	0	0	13	29
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	20.4	20.4		11.9	23.9		26.7	26.7		28.5	28.5	28.5
Total Split (s)	24.6	24.6		11.9	36.5		28.5	28.5		28.5	28.5	28.5
Total Split (%)	37.8%	37.8%		18.3%	56.2%		43.8%	43.8%		43.8%	43.8%	43.8%
Maximum Green (s)	19.2	19.2		7.0	31.6		22.8	22.8		23.0	23.0	23.0
Yellow Time (s)	3.5	3.5		3.0	3.1		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	1.9	1.9		1.9	1.8		2.4	2.4		2.2	2.2	2.2
Lost Time Adjust (s)		-0.4			0.1			-0.7			-0.5	-0.5
Total Lost Time (s)		5.0			5.0			5.0			5.0	5.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		1.0	2.0		1.0	1.0		1.0	1.0	1.0
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	8.0	8.0			12.0		14.0	14.0		16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)		53.7			53.7			8.4			8.3	8.3
Actuated g/C Ratio		0.83			0.83			0.13			0.13	0.13
v/c Ratio		0.09			0.20			0.39			0.06	0.09
Control Delay		2.4			1.7			27.5			24.8	0.6
Queue Delay		0.0			0.0			0.0			0.0	0.0

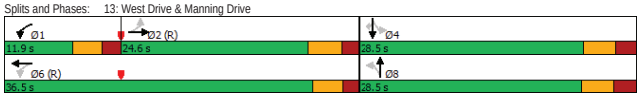
UNC DP TIA 2023 — Existing (2023) PM
13: West Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		2.4			1.7			27.5			24.8	0.6
LOS		A			A			C			C	A
Approach Delay		2.4			1.7			27.5			8.1	
Approach LOS		A			A			C			A	
Queue Length 50th (ft)		10			25			22			5	0
Queue Length 95th (ft)		22			21			55			18	0
Internal Link Dist (ft)		308			254			269			213	
Turn Bay Length (ft)												
Base Capacity (vph)		2686			2711			504			569	652
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.09			0.20			0.15			0.02	0.04

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.39
Intersection Signal Delay: 4.3 — Intersection LOS: A
Intersection Capacity Utilization 48.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 13: West Drive & Manning Drive



UNC DP TIA 2023 — Existing (2023) PM
14: East Drive/Hospital Entrance & Manning Drive — Lanes, Volumes, Timings

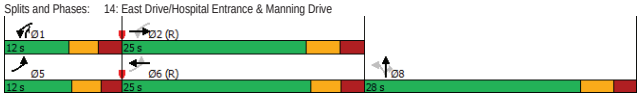
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	205	49	81	409	44	101	33	367	0	0	0
Future Volume (vph)	30	205	49	81	409	44	101	33	367	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		-4%			3%			-4%			0%	
Storage Length (ft)	150		0	100		0	100		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.94	0.96		0.87	0.99				0.95			
Frt		0.971			0.985				0.850			
Flt Protected	0.950			0.950				0.964				
Satd. Flow (prot)	1685	3143	0	1627	3162	0	0	1709	1507	0	0	0
Flt Permitted	0.467			0.579				0.964				
Satd. Flow (perm)	780	3143	0	867	3162	0	0	1709	1437	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		46			18				153			
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		382			469			315			391	
Travel Time (s)		7.4			9.1			8.6			10.7	
Confl. Peds. (#/hr)	124		109	109		124			40	40		
Confl. Bikes (#/hr)			3									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	33	228	54	90	454	49	112	37	408	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	282	0	90	503	0	0	149	408	0	0	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov			
Protected Phases	5	2		1	6			8	1			
Permitted Phases	6			2			8		8			
Detector Phase	5	2		1	6		8	8	1			
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		7.0	7.0	5.0			
Minimum Split (s)	12.4	25.0		12.4	24.6		27.8	27.8	12.4			
Total Split (s)	12.0	25.0		12.0	25.0		28.0	28.0	12.0			
Total Split (%)	18.5%	38.5%		18.5%	38.5%		43.1%	43.1%	18.5%			
Maximum Green (s)	6.9	19.0		6.6	19.4		22.2	22.2	6.6			
Yellow Time (s)	3.0	3.4		3.0	3.1		3.4	3.4	3.0			
All-Red Time (s)	2.1	2.6		2.4	2.5		2.4	2.4	2.4			
Lost Time Adjust (s)	-0.4	-0.9		-0.4	-0.6			-1.2	-0.4			
Total Lost Time (s)	4.7	5.1		5.0	5.0			4.6	5.0			
Lead/Lag	Lead	Lag		Lead	Lag				Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	1.0	1.0			
Recall Mode	None	C-Min		None	C-Min		None	None	None			
Walk Time (s)		7.0			7.0		7.0	7.0				
Flash Dont Walk (s)		12.0			12.0		15.0	15.0				
Pedestrian Calls (#/hr)		0			0		0	0				
Act Effct Green (s)	45.5	33.9		42.1	44.1			10.8	17.0			

UNC DP TIA 2023 — Existing (2023) PM
14: East Drive/Hospital Entrance & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.70	0.52		0.65	0.68			0.17	0.26			
v/c Ratio	0.05	0.17		0.14	0.23			0.52	0.82			
Control Delay	3.0	5.9		2.5	4.1			30.9	24.7			
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0			
Total Delay	3.0	5.9		2.5	4.1			30.9	24.7			
LOS	A	A		A	A			C	C			
Approach Delay		5.6			3.8			26.4				
Approach LOS		A			A			C				
Queue Length 50th (ft)	2	9		6	17			55	82			
Queue Length 95th (ft)	7	42		15	87			97	124			
Internal Link Dist (ft)		302			389			235			311	
Turn Bay Length (ft)	150			100								
Base Capacity (vph)	657	1661		667	2150			615	506			
Starvation Cap Reductn	0	0		0	0			0	0			
Spillback Cap Reductn	0	0		0	0			0	0			
Storage Cap Reductn	0	0		0	0			0	0			
Reduced v/c Ratio	0.05	0.17		0.13	0.23			0.24	0.81			

Intersection Summary
Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 12.8 — Intersection LOS: B
Intersection Capacity Utilization 50.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 14: East Drive/Hospital Entrance & Manning Drive



UNC DP TIA 2023 — Existing (2023) PM
15: Skipper Bowles Drive/Ridge Road & Manning Drive — Lanes, Volumes, Timings

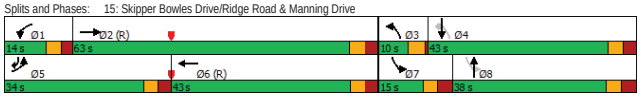
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	689	52	12	147	55	115	133	37	102	77	180
Future Volume (vph)	171	689	52	12	147	55	115	133	37	102	77	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	10	11	12	10	12	12	12	12	12
Grade (%)		-2%			6%			12%			2%	
Storage Length (ft)	100		0	100		0	0		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			0.99		1.00					0.98
Frt		0.989			0.959			0.967				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	3414	0	1602	3162	0	1553	1693	0	1752	1844	1567
Flt Permitted	0.950			0.950			0.683			0.377		
Satd. Flow (perm)	1663	3414	0	1602	3162	0	1113	1693	0	695	1844	1543
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			42			10				200
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		348			791			579			293	
Travel Time (s)		9.5			21.6			15.8			8.0	
Confl. Peds. (#/hr)	2					2	2					2
Confl. Bikes (#/hr)			2									2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	190	766	58	13	163	61	128	148	41	113	86	200
Shared Lane Traffic (%)												
Lane Group Flow (vph)	190	824	0	13	224	0	128	189	0	113	86	200
Turn Type	Prot	NA		Prot	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases							4			8		4
Detector Phase	5	2		1	6		3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		4.0	7.0		7.0	7.0	7.0
Minimum Split (s)	12.9	35.2		12.8	37.0		8.0	34.3		13.0	33.0	12.9
Total Split (s)	34.0	63.0		14.0	43.0		10.0	38.0		15.0	43.0	34.0
Total Split (%)	26.2%	48.5%		10.8%	33.1%		7.7%	29.2%		11.5%	33.1%	26.2%
Maximum Green (s)	28.4	56.8		8.6	37.0		6.0	31.7		9.0	37.0	28.4
Yellow Time (s)	3.0	3.3		3.0	3.0		3.5	3.0		3.0	3.1	3.0
All-Red Time (s)	2.6	2.9		2.4	3.0		0.5	3.3		3.0	2.9	2.6
Lost Time Adjust (s)	-0.9	-1.3		-0.8	-1.1		-1.2	-1.2		-0.9	-0.9	-0.9
Total Lost Time (s)	4.7	4.9		4.6	4.9		2.8	5.1		5.1	5.1	4.7
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	2.0	3.0		2.0	2.0		3.0	2.0		2.0	2.0	2.0
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			24.0			21.0			20.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	20.1	78.6		7.9	58.8		35.9	19.5		31.3	18.7	39.1

UNC DP TIA 2023 — Existing (2023) PM
15: Skipper Bowles Drive/Ridge Road & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.15	0.60		0.06	0.45		0.28	0.15		0.24	0.14	0.30
v/c Ratio	0.74	0.40		0.13	0.15		0.36	0.72		0.43	0.33	0.33
Control Delay	64.3	14.7		61.1	20.0		35.8	64.5		39.2	51.9	4.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	64.3	14.7		61.1	20.0		35.8	64.5		39.2	51.9	4.5
LOS	E	B		E	C		D	E		D	D	A
Approach Delay		24.0			22.3			52.9			24.6	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	144	148		11	46		81	146		73	66	0
Queue Length 95th (ft)	221	334		33	92		119	213		111	111	44
Internal Link Dist (ft)		268			711			499			213	
Turn Bay Length (ft)	100			100								100
Base Capacity (vph)	375	2066		115	1454		357	435		269	537	705
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.51	0.40		0.11	0.15		0.36	0.43		0.42	0.16	0.28

Intersection Summary
Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 112 (86%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 28.6 — Intersection LOS: C
Intersection Capacity Utilization 66.9% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 15: Skipper Bowles Drive/Ridge Road & Manning Drive



UNC DP TIA 2023 — Existing (2023) PM
16: Columbia Street & Westwood Drive/Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	6	416	7	81	19	340	98	81	691	9
Future Volume (vph)	1	0	6	416	7	81	19	340	98	81	691	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-1%			-3%			-3%			4%	
Storage Length (ft)	0		0	0		250	150		200	0		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.87			0.88	0.88			0.96	0.99	1.00	
Frt		0.882				0.850			0.850		0.998	
Flt Protected		0.994			0.953		0.950			0.950		
Satd. Flow (prot)	0	1430	0	0	1742	1554	1796	1891	1714	1676	1760	0
Flt Permitted		0.994			0.953		0.120			0.363		
Satd. Flow (perm)	0	1422	0	0	1525	1369	227	1891	1650	636	1760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		129				90			109		1	
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		283			749			309			956	
Travel Time (s)		6.4			20.4			8.4			26.1	
Confl. Peds. (#/hr)	38		47	47		38	66		8	8		6
Confl. Bikes (#/hr)			1			16						14
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1	0	7	462	8	90	21	378	109	90	768	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	470	90	21	378	109	90	778	0
Turn Type	Split	NA		Split	NA	pm+ov	D.Pm	NA	pm+ov	D.P+P	NA	
Protected Phases	4	4		3	3	1		2	3	1	6	
Permitted Phases						3	6		2	2		
Detector Phase	4	4		3	3	1	6	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	10.0	10.0	7.0	7.0	10.0	
Minimum Split (s)	28.3	28.3		33.4	33.4	11.9	16.9	30.9	33.4	11.9	16.9	
Total Split (s)	28.3	28.3		40.0	40.0	12.0	51.7	39.7	40.0	12.0	51.7	
Total Split (%)	23.6%	23.6%		33.3%	33.3%	10.0%	43.1%	33.1%	33.3%	10.0%	43.1%	
Maximum Green (s)	22.0	22.0		33.6	33.6	7.1	45.8	33.8	33.6	7.1	45.8	
Yellow Time (s)	3.3	3.3		3.5	3.5	3.1	3.6	3.6	3.5	3.1	3.6	
All-Red Time (s)	3.0	3.0		2.9	2.9	1.8	2.3	2.3	2.9	1.8	2.3	
Lost Time Adjust (s)		-1.3			-1.4	0.1	-0.9	-0.9	-1.4	0.1	-0.9	
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead		Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min	None	None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Flash Dont Walk (s)	18.0	18.0		23.0	23.0		7.0	21.0	23.0		7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	
Act Effct Green (s)		8.4			30.9	37.9	47.1	35.0	66.0	42.0	47.1	

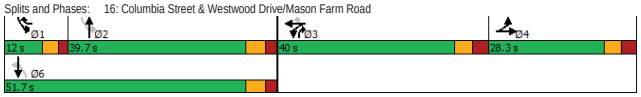
UNC DP TIA 2023 — Existing (2023) PM
16: Columbia Street & Westwood Drive/Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.09			0.34	0.42	0.52	0.39	0.73	0.46	0.52	
v/c Ratio		0.03			0.79	0.14	0.18	0.52	0.09	0.24	0.85	
Control Delay		0.3			38.3	3.2	19.7	26.1	0.9	15.0	31.3	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		0.3			38.3	3.2	19.7	26.1	0.9	15.0	31.3	
LOS		A			D	A	B	C	A	B	C	
Approach Delay		0.3			32.6			20.4			29.6	
Approach LOS		A			C			C			C	
Queue Length 50th (ft)		0			227	0	6	159	0	24	354	
Queue Length 95th (ft)		0			#450	21	29	311	14	66	#776	
Internal Link Dist (ft)		203			669			229			876	
Turn Bay Length (ft)						250	150		200			
Base Capacity (vph)		467			679	641	118	732	1332	377	916	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.02			0.69	0.14	0.18	0.52	0.08	0.24	0.85	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 90.4
Natural Cycle: 135
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 27.9 — Intersection LOS: C
Intersection Capacity Utilization 87.8% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 16: Columbia Street & Westwood Drive/Mason Farm Road



Existing (2023) PM.syn — VHB

UNC DP TIA 2023 — Existing (2023) PM
17: West Drive & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	156	8	4	430	47	0	0	0	23	0	11
Future Volume (vph)	9	156	8	4	430	47	0	0	0	23	0	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			4%			0%			1%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.98						0.88	
Frt		0.994			0.987						0.957	
Flt Protected		0.997									0.967	
Satd. Flow (prot)	0	1847	0	0	1770	0	0	0	0	0	1680	0
Flt Permitted		0.975			0.998						0.967	
Satd. Flow (perm)	0	1801	0	0	1763	0	0	0	0	0	1509	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			13						51	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		344			481			500			293	
Travel Time (s)		9.4			13.1			11.4			8.0	
Confl. Peds. (#/hr)	88		123	123		88	31		99	99		31
Confl. Bikes (#/hr)			3			2						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	173	9	4	478	52	0	0	0	26	0	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	192	0	0	534	0	0	0	0	0	38	0
Turn Type	Perm	NA		Perm	NA					Perm	NA	
Protected Phases		2			6						4	
Permitted Phases	2			6						4		
Detector Phase	2	2		6	6					4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0					7.0	7.0	
Minimum Split (s)	23.0	23.0		23.8	23.8					25.6	25.6	
Total Split (s)	34.4	34.4		34.4	34.4					25.6	25.6	
Total Split (%)	57.3%	57.3%		57.3%	57.3%					42.7%	42.7%	
Maximum Green (s)	29.4	29.4		28.6	28.6					20.0	20.0	
Yellow Time (s)	3.5	3.5		3.0	3.0					3.2	3.2	
All-Red Time (s)	1.5	1.5		2.8	2.8					2.4	2.4	
Lost Time Adjust (s)		0.0			-0.9						-0.2	
Total Lost Time (s)		5.0			4.9						5.4	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0					2.0	2.0	
Recall Mode	Min	Min		Min	Min					None	None	
Walk Time (s)	7.0	7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)	6.0	6.0		9.0	9.0					13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0					0	0	
Act Effct Green (s)		33.0			33.0						7.6	
Actuated g/C Ratio		0.86			0.86						0.20	
v/c Ratio		0.12			0.35						0.11	
Control Delay		2.5			3.4						6.6	
Queue Delay		0.0			0.0						0.0	

Existing (2023) PM.syn — VHB

UNC DP TIA 2023 — Existing (2023) PM
17: West Drive & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		2.5			3.4						6.6	
LOS		A			A						A	
Approach Delay		2.5			3.4						6.6	
Approach LOS		A			A						A	
Queue Length 50th (ft)		0			0						0	
Queue Length 95th (ft)		34			109						16	
Internal Link Dist (ft)		264			401			420			213	
Turn Bay Length (ft)												
Base Capacity (vph)		1498			1472						861	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.13			0.36						0.04	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 38.4
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.35
Intersection Signal Delay: 3.3 — Intersection LOS: A
Intersection Capacity Utilization 50.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 17: West Drive & Mason Farm Road



Existing (2023) PM.syn — VHB

UNC DP TIA 2023 — Existing (2023) PM
18: Mason Farm Road & East Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	210	88	92	207	11	67	3	26	0	0	0
Future Volume (vph)	17	210	88	92	207	11	67	3	26	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	50		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.91	0.92		0.87	0.99			0.93				
Frt		0.956			0.993			0.963				
Flt Protected	0.950			0.950				0.966				
Satd. Flow (prot)	1770	1636	0	1770	1836	0	0	1640	0	0	0	0
Flt Permitted	0.608			0.431				0.966				
Satd. Flow (perm)	1036	1636	0	699	1836	0	0	1569	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			3			19				
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		481			155			560			76	
Travel Time (s)		13.1			4.2			15.3			1.7	
Confl. Peds. (#/hr)	70		135	135		70	26		37	37		16
Confl. Bikes (#/hr)			7			2			1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	19	233	98	102	230	12	74	3	29	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	331	0	102	242	0	0	106	0	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA				
Protected Phases	5	2		1	6		8	8				
Permitted Phases	2			6								
Detector Phase	5	2		1	6		8	8				
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0				
Minimum Split (s)	29.1	29.3		29.8	19.3		24.3	24.3				
Total Split (s)	29.1	35.7		29.9	36.5		24.4	24.4				
Total Split (%)	32.3%	39.7%		33.2%	40.6%		27.1%	27.1%				
Maximum Green (s)	25.0	30.4		25.1	31.2		19.1	19.1				
Yellow Time (s)	3.0	3.2		3.0	3.2		3.0	3.0				
All-Red Time (s)	1.1	2.1		1.8	2.1		2.3	2.3				
Lost Time Adjust (s)	0.9	-0.2		0.4	-0.2			-0.4				
Total Lost Time (s)	5.0	5.1		5.2	5.1			4.9				
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	1.0				
Recall Mode	None	Min		None	Min		None	None				
Walk Time (s)	5.0	7.0		5.0	7.0		7.0	7.0				
Flash Dont Walk (s)	20.0	17.0		20.0	7.0		12.0	12.0				
Pedestrian Calls (#/hr)	0	0		0	0		0	0				
Act Effct Green (s)	22.9	19.6		26.3	26.7			8.2				
Actuated g/C Ratio	0.54	0.46		0.62	0.63			0.19				

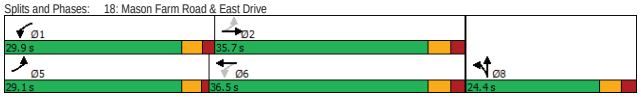
UNC DP TIA 2023 — Existing (2023) PM
18: Mason Farm Road & East Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.03	0.43		0.17	0.21			0.32				
Control Delay	4.2	13.1		4.8	7.1			17.3				
Queue Delay	0.0	0.0		0.0	0.0			0.0				
Total Delay	4.2	13.1		4.8	7.1			17.3				
LOS	A	B		A	A			B				
Approach Delay		12.7			6.4			17.3				
Approach LOS		B			A			B				
Queue Length 50th (ft)	2	61		9	22			19				
Queue Length 95th (ft)	7	131		25	92			58				
Internal Link Dist (ft)		401			75			480			1	
Turn Bay Length (ft)	50			100								
Base Capacity (vph)	1104	1228		1100	1398			792				
Starvation Cap Reductn	0	0		0	0			0				
Spillback Cap Reductn	0	0		0	0			0				
Storage Cap Reductn	0	0		0	0			0				
Reduced v/c Ratio	0.02	0.27		0.09	0.17			0.13				

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 42.2
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.43
Intersection Signal Delay: 10.6 — Intersection LOS: B
Intersection Capacity Utilization 53.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 18: Mason Farm Road & East Drive



UNC DP TIA 2023 — Existing (2023) PM
19: Mason Farm Road & Purefoy Road — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	24	38	11	68	236	46
Future Volume (vph)	24	38	11	68	236	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.918				0.978	
Flt Protected	0.981			0.993		
Satd. Flow (prot)	1678	0	0	1850	1822	0
Flt Permitted	0.981			0.993		
Satd. Flow (perm)	1678	0	0	1850	1822	0
Link Speed (mph)	25			30	30	
Link Distance (ft)	563			318	480	
Travel Time (s)	15.4			7.2	10.9	
Confl. Peds. (#/hr)	15	22	7			7
Confl. Bikes (#/hr)		2				15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	27	42	12	76	262	51
Shared Lane Traffic (%)						
Lane Group Flow (vph)	69	0	0	88	313	0
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 31.3% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
19: Mason Farm Road & Purefoy Road — HCM 2010 AWSC

Intersection

Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	24	38	11	68	236	46
Future Vol, veh/h	24	38	11	68	236	46
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	42	12	76	262	51
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.9	8	9.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	14%	39%	0%
Vol Thru, %	86%	0%	84%
Vol Right, %	0%	61%	16%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	79	62	282
LT Vol	11	24	0
Through Vol	68	0	236
RT Vol	0	38	46
Lane Flow Rate	88	69	313
Geometry Grp	1	1	1
Degree of Util (X)	0.108	0.086	0.35
Departure Headway (Hd)	4.43	4.505	4.023
Convergence, Y/N	Yes	Yes	Yes
Cap	813	799	884
Service Time	2.436	2.511	2.099
HCM Lane V/C Ratio	0.108	0.086	0.354
HCM Control Delay	8	7.9	9.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.4	0.3	1.6



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	813	12	45	184	11	190
Future Volume (vph)	813	12	45	184	11	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.998					0.850
Flt Protected				0.990	0.950	
Satd. Flow (prot)	3532	0	0	3504	1770	1583
Flt Permitted				0.990	0.950	
Satd. Flow (perm)	3532	0	0	3504	1770	1583
Link Speed (mph)	35			35	35	
Link Distance (ft)	336			902	340	
Travel Time (s)	6.5			17.6	6.6	
Confl. Peds. (#/hr)		16	16			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	903	13	50	204	12	211
Shared Lane Traffic (%)						
Lane Group Flow (vph)	916	0	0	254	12	211
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 42.6% ICU Level of Service A
Analysis Period (min) 15

Intersection

Int Delay, s/veh 3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	813	12	45	184	11	190
Future Vol, veh/h	813	12	45	184	11	190
Conflicting Peds, #/hr	0	16	16	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	903	13	50	204	12	211

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	932	0	1128	474
Stage 1	-	-	-	-	926	-
Stage 2	-	-	-	-	202	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	730	-	198	537
Stage 1	-	-	-	-	346	-
Stage 2	-	-	-	-	812	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	720	-	180	530
Mov Cap-2 Maneuver	-	-	-	-	180	-
Stage 1	-	-	-	-	342	-
Stage 2	-	-	-	-	749	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	16.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	180	530	-	-	720	-
HCM Lane V/C Ratio	0.068	0.398	-	-	0.069	-
HCM Control Delay (s)	26.5	16.2	-	-	10.4	0.3
HCM Lane LOS	D	C	-	-	B	A
HCM 95th %tile Q(veh)	0.2	1.9	-	-	0.2	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	42	22	355	40	11	1083
Future Volume (vph)	42	22	355	40	11	1083
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	250	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.954		0.986			
Flt Protected	0.968				0.950	
Satd. Flow (prot)	1720	0	1837	0	1770	1863
Flt Permitted	0.968				0.950	
Satd. Flow (perm)	1720	0	1837	0	1770	1863
Link Speed (mph)	25		25			25
Link Distance (ft)	654		109			397
Travel Time (s)	17.8		3.0			10.8
Confl. Peds. (#/hr)	12			3	3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	24	394	44	12	1203
Shared Lane Traffic (%)						
Lane Group Flow (vph)	71	0	438	0	12	1203
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 67.3% ICU Level of Service C
Analysis Period (min) 15

Intersection

Int Delay, s/veh 2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	42	22	355	40	11	1083
Future Vol, veh/h	42	22	355	40	11	1083
Conflicting Peds, #/hr	12	0	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	24	394	44	12	1203

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1658	419	0	0	441	0
Stage 1	419	-	-	-	-	-
Stage 2	1239	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	107	634	-	-	1119	-
Stage 1	664	-	-	-	-	-
Stage 2	273	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	105	632	-	-	1116	-
Mov Cap-2 Maneuver	105	-	-	-	-	-
Stage 1	663	-	-	-	-	-
Stage 2	267	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	50.5	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	147	1116	-
HCM Lane V/C Ratio	-	-	0.484	0.011	-
HCM Control Delay (s)	-	-	50.5	8.3	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	2.3	0	-

UNC DP TIA 2023 — Existing (2023) PM
22: Columbia Street & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	827	3	38	313	360	0	0	723	361
Future Volume (vph)	0	0	0	827	3	38	313	360	0	0	723	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			2%			-2%	
Storage Length (ft)	0		0	600		600	250		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor				0.99	0.99							0.95
Frt						0.850						0.850
Flt Protected				0.950	0.953		0.950					
Satd. Flow (prot)	0	0	0	1656	1661	1560	1752	3504	0	0	3575	1599
Flt Permitted				0.950	0.953		0.201					
Satd. Flow (perm)	0	0	0	1647	1652	1560	371	3504	0	0	3575	1519
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						72						329
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1226			1188			609			378	
Travel Time (s)		33.4			32.4			16.6			10.3	
Confl. Peds. (#/hr)			3	3			4		3	3		4
Confl. Bikes (#/hr)												10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	919	3	42	348	400	0	0	803	401
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	459	463	42	348	400	0	0	803	401
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	7.0	10.0			10.0	10.0
Minimum Split (s)				29.8	29.8	29.8	12.8	28.1			16.1	16.1
Total Split (s)				73.0	73.0	73.0	35.0	67.0			32.0	32.0
Total Split (%)				52.1%	52.1%	52.1%	25.0%	47.9%			22.9%	22.9%
Maximum Green (s)				67.2	67.2	67.2	29.2	60.9			25.9	25.9
Yellow Time (s)				3.7	3.7	3.7	3.0	4.0			4.0	4.0
All-Red Time (s)				2.1	2.1	2.1	2.8	2.1			2.1	2.1
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				5.8	5.8	5.8	5.8	6.1			6.1	6.1
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				1.0	1.0	1.0	1.0	3.0			3.0	3.0
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0		7.0				
Flash Dont Walk (s)				17.0	17.0	17.0		15.0				
Pedestrian Calls (#/hr)				0	0	0		0				
Act Effct Green (s)				46.1	46.1	46.1	82.3	82.0			47.0	47.0
Actuated g/C Ratio				0.33	0.33	0.33	0.59	0.59			0.34	0.34

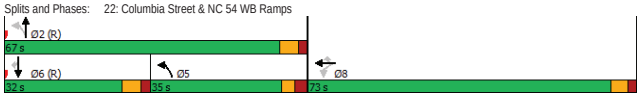
UNC DP TIA 2023 — Existing (2023) PM
22: Columbia Street & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio				0.85	0.85	0.07	0.69	0.20			0.67	0.55
Control Delay				57.7	58.1	1.6	34.2	10.3			44.8	11.7
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				57.7	58.1	1.6	34.2	10.3			44.8	11.7
LOS				E	E	A	C	B			D	B
Approach Delay					55.4			21.4			33.8	
Approach LOS					E			C			C	
Queue Length 50th (ft)				408	412	0	140	82			330	46
Queue Length 95th (ft)				483	488	7	312	182			#495	170
Internal Link Dist (ft)		1146			1108			529			298	
Turn Bay Length (ft)				600		600	250					
Base Capacity (vph)				790	792	786	506	2051			1199	728
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.58	0.58	0.05	0.69	0.20			0.67	0.55

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 137 (98%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 37.8 — Intersection LOS: D
Intersection Capacity Utilization 76.7% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 22: Columbia Street & NC 54 WB Ramps



Existing (2023) PM.syn VHB

UNC DP TIA 2023 — Existing (2023) PM
23: Columbia Street & NC 54 EB Ramps/Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	0	256	0	0	0	0	580	0	95	1517	0
Future Volume (vph)	108	0	256	0	0	0	0	580	0	95	1517	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			0%			3%			-6%	
Storage Length (ft)	250		250	0		0	0		0	250		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850									
Flt Protected	0.950	0.950								0.950		
Satd. Flow (prot)	1664	1664	1567	0	0	0	0	3486	0	1823	3645	0
Flt Permitted	0.950	0.950								0.361		
Satd. Flow (perm)	1664	1664	1567	0	0	0	0	3486	0	693	3645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			66									
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		975			270			219			609	
Travel Time (s)		22.2			6.1			6.0			16.6	
Confl. Peds. (#/hr)							7					7
Confl. Bikes (#/hr)									1			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	120	0	284	0	0	0	0	644	0	106	1686	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	60	60	284	0	0	0	0	644	0	106	1686	0
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	13.2	13.2	13.2					16.0		12.5	27.0	
Total Split (s)	40.0	40.0	40.0					80.0		20.0	100.0	
Total Split (%)	28.6%	28.6%	28.6%					57.1%		14.3%	71.4%	
Maximum Green (s)	33.8	33.8	33.8					74.0		14.5	94.0	
Yellow Time (s)	3.1	3.1	3.1					4.3		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.7		2.4	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2	6.2					6.0		5.5	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	2.0	2.0	2.0					3.0		1.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Walk Time (s)											7.0	
Flash Dont Walk (s)											14.0	
Pedestrian Calls (#/hr)											0	
Act Effct Green (s)	24.5	24.5	24.5					90.5		103.8	103.3	
Actuated g/C Ratio	0.18	0.18	0.18					0.65		0.74	0.74	

Existing (2023) PM.syn VHB

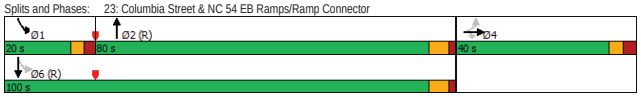
UNC DP TIA 2023 — Existing (2023) PM
23: Columbia Street & NC 54 EB Ramps/Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.21	0.21	0.87					0.29		0.19	0.63	
Control Delay	48.4	48.4	66.9					16.7		2.8	3.3	
Queue Delay	0.0	0.0	0.0					0.0		0.0	0.2	
Total Delay	48.4	48.4	66.9					16.7		2.8	3.5	
LOS	D	D	E					B		A	A	
Approach Delay		61.4						16.7			3.4	
Approach LOS		E						B			A	
Queue Length 50th (ft)	49	49	199					113		4	31	
Queue Length 95th (ft)	88	88	288					274		m19	116	
Internal Link Dist (ft)		895					190	139			529	
Turn Bay Length (ft)	250		250							250		
Base Capacity (vph)	401	401	428					2254		630	2688	
Starvation Cap Reductn	0	0	0					0		0	293	
Spillback Cap Reductn	0	0	0					0		0	0	
Storage Cap Reductn	0	0	0					0		0	0	
Reduced v/c Ratio	0.15	0.15	0.66					0.29		0.17	0.70	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 97 (69%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 14.7 — Intersection LOS: B
Intersection Capacity Utilization 76.7% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Columbia Street & NC 54 EB Ramps/Ramp Connector



Existing (2023) PM.syn VHB

UNC DP TIA 2023 — Existing (2023) PM
24: Fordham Blvd & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Volume (vph)	0	1460	1977	47	0	108
Future Volume (vph)	0	1460	1977	47	0	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.997			0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3529	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	3529	0	0	1611
Link Speed (mph)		45	45		30	
Link Distance (ft)		1661	919		168	
Travel Time (s)		25.2	13.9		3.8	
Confl. Peds. (#/hr)					1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1622	2197	52	0	120
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1622	2249	0	0	120
Sign Control		Free	Free		Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 69.5% — ICU Level of Service C
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
24: Fordham Blvd & Mason Farm Road — HCM 2010 TWSC

Intersection
Int Delay, s/veh 1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Vol, veh/h	0	1460	1977	47	0	108
Future Vol, veh/h	0	1460	1977	47	0	108
Conflicting Peds, #/hr	0	0	0	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1622	2197	52	0	120

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1125
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	199
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	199
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	47.3
HCM LOS			E

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	199
HCM Lane V/C Ratio	-	-	-	0.603
HCM Control Delay (s)	-	-	-	47.3
HCM Lane LOS	-	-	-	E
HCM 95th %tile Q(veh)	-	-	-	3.4

UNC DP TIA 2023 — Existing (2023) PM
25: Manning Drive & Fordham Blvd — Lanes, Volumes, Timings

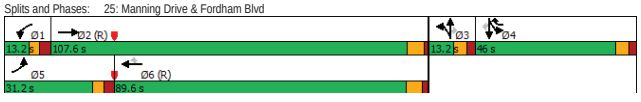
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↑	↑↑	↳	↰	↑↑	↱		↑	↱	↰↑	↑	↱
Traffic Volume (vph)	86	1475	1	14	1830	105	13	0	21	817	3	228
Future Volume (vph)	86	1475	1	14	1830	105	13	0	21	817	3	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			0%			0%			-4%	
Storage Length (ft)	350		0	150		900	0		75	500		400
Storage Lanes	2		0	1		1	0		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor		1.00		1.00		0.99		0.97				0.98
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950				0.950		0.950		
Satd. Flow (prot)	3519	3628	0	1770	3539	1583	0	1770	1583	3502	1900	1615
Flt Permitted	0.950			0.950				0.950		0.950		
Satd. Flow (perm)	3519	3628	0	1764	3539	1563	0	1723	1583	3502	1900	1584
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						117			133			237
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		455			1093			556			574	
Travel Time (s)		6.9			16.6			15.2			11.2	
Confl. Peds. (#/hr)			3	3			4					4
Confl. Bikes (#/hr)						3						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	96	1639	1	16	2033	117	14	0	23	908	3	253
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	1640	0	16	2033	117	0	14	23	908	3	253
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6	4	3	3		4	4	
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	7.0	12.0	7.0	7.0	7.0	12.0	12.0	12.0
Minimum Split (s)	31.2	18.1		13.2	18.3	31.2	13.2	13.2	13.2	31.2	31.2	31.2
Total Split (s)	31.2	107.6		13.2	89.6	46.0	13.2	13.2	13.2	46.0	46.0	46.0
Total Split (%)	17.3%	59.8%		7.3%	49.8%	25.6%	7.3%	7.3%	7.3%	25.6%	25.6%	25.6%
Maximum Green (s)	25.0	101.5		7.0	83.3	39.8	7.0	7.0	7.0	39.8	39.8	39.8
Yellow Time (s)	3.0	4.7		3.0	4.5	3.8	3.8	3.8	3.8	3.8	3.8	3.8
All-Red Time (s)	3.2	1.4		3.2	1.8	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.2	-1.1		-1.2	-1.3	-1.2		-1.2	-1.2	-1.2	-1.2	-1.2
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?		Yes				Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	6.0		1.0	1.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Gap (s)	3.0	3.0		2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	20.0		0.0	0.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Time To Reduce (s)	0.0	60.0		0.0	0.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Recall Mode	None	C-Max		None	C-Max	None	None	None	None	None	None	None
Walk Time (s)	7.0											
Flash Dont Walk (s)	18.0											

UNC DP TIA 2023 — Existing (2023) PM
25: Manning Drive & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)		4										
Act Effct Green (s)	12.6	107.9		8.2	98.2	141.8		8.2	8.2	43.6	43.6	43.6
Actuated g/C Ratio	0.07	0.60		0.05	0.55	0.79		0.05	0.05	0.24	0.24	0.24
v/c Ratio	0.39	0.75		0.20	1.05	0.09		0.17	0.12	1.07	0.01	0.45
Control Delay	83.0	30.1		88.8	75.1	0.7		87.8	1.2	113.1	54.0	10.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	83.0	30.1		88.8	75.1	0.7		87.8	1.2	113.1	54.0	10.5
LOS	F	C		F	E	A		F	A	F	D	B
Approach Delay		33.0			71.1			34.0			90.6	
Approach LOS		C			E			C			F	
Queue Length 50th (ft)	58	781		19	~1334	0		16	0	~641	3	15
Queue Length 95th (ft)	83	876		48	#1669	13		45	0	#779	13	100
Internal Link Dist (ft)		375			1013			476			494	
Turn Bay Length (ft)	350			150		900			75	500		400
Base Capacity (vph)	512	2174		80	1930	1261		80	199	848	460	563
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.19	0.75		0.20	1.05	0.09		0.17	0.12	1.07	0.01	0.45

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 62.4 — Intersection LOS: E
Intersection Capacity Utilization 88.9% — ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 25: Manning Drive & Fordham Blvd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	79	116	3	37	5	10	1	0	10	7	22
Future Volume (vph)	11	79	116	3	37	5	10	1	0	10	7	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	10	10	12	10	12	10	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.924			0.984						0.925	
Flt Protected		0.997			0.997			0.956			0.987	
Satd. Flow (prot)	0	1602	0	0	1706	0	0	1781	0	0	1701	0
Flt Permitted		0.997			0.997			0.956			0.987	
Satd. Flow (perm)	0	1602	0	0	1706	0	0	1781	0	0	1701	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1056			735			360			184	
Travel Time (s)		28.8			20.0			9.8			5.0	
Confl. Peds. (#/hr)	28					28	2					2
Confl. Bikes (#/hr)			4									3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	88	129	3	41	6	11	1	0	11	8	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	229	0	0	50	0	0	12	0	0	43	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 25.3% ICU Level of Service A
Analysis Period (min) 15

Intersection

Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	79	116	3	37	5	10	1	0	10	7	22
Future Vol, veh/h	11	79	116	3	37	5	10	1	0	10	7	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	88	129	3	41	6	11	1	0	11	8	24
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	7.5	7.8	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	91%	5%	7%	26%
Vol Thru, %	9%	38%	82%	18%
Vol Right, %	0%	56%	11%	56%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	11	206	45	39
LT Vol	10	11	3	10
Through Vol	1	79	37	7
RT Vol	0	116	5	22
Lane Flow Rate	12	229	50	43
Geometry Grp	1	1	1	1
Degree of Util (X)	0.016	0.238	0.058	0.05
Departure Headway (Hd)	4.736	3.742	4.152	4.134
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	760	954	855	851
Service Time	2.736	1.785	2.215	2.232
HCM Lane V/C Ratio	0.016	0.24	0.058	0.051
HCM Control Delay	7.8	8	7.5	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.9	0.2	0.2

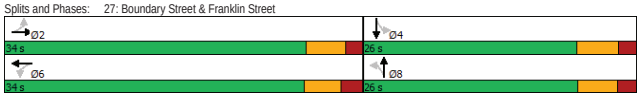
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	540	11	26	764	133	12	69	99	68	16	6
Future Volume (vph)	15	540	11	26	764	133	12	69	99	68	16	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	12	11	11	12
Grade (%)		-3%			1%			2%			-1%	
Storage Length (ft)	0		0	0		0	50		0	75		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.99	0.99			0.99	
Frt		0.997			0.978			0.912			0.958	
Flt Protected		0.999			0.999		0.950			0.950		
Satd. Flow (prot)	0	3577	0	0	3425	0	1694	1611	0	1754	1757	0
Flt Permitted		0.919			0.928		0.741			0.640		
Satd. Flow (perm)	0	3290	0	0	3181	0	1306	1611	0	1181	1757	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			44			110			7	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1100			226			551			371	
Travel Time (s)		30.0			6.2			15.0			10.1	
Confl. Peds. (#/hr)	10					10	12					12
Confl. Bikes (#/hr)			1			3			5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	17	600	12	29	849	148	13	77	110	76	18	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	629	0	0	1026	0	13	187	0	76	25	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.4	15.4		15.6	15.6		12.6	12.6		24.7	24.7	
Total Split (s)	34.0	34.0		34.0	34.0		26.0	26.0		26.0	26.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	28.6	28.6		28.4	28.4		20.4	20.4		20.3	20.3	
Yellow Time (s)	3.7	3.7		3.5	3.5		3.7	3.7		3.9	3.9	
All-Red Time (s)	1.7	1.7		2.1	2.1		1.9	1.9		1.8	1.8	
Lost Time Adjust (s)		-0.4			-0.6		-0.6	-0.6		-0.7	-0.7	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		1.0	1.0		1.0	1.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										12.0	12.0	
Pedestrian Calls (#/hr)										0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		23.7			23.7		8.6	8.6		8.6	8.6	
Actuated g/C Ratio		0.62			0.62		0.23	0.23		0.23	0.23	
v/c Ratio		0.31			0.51		0.04	0.42		0.29	0.06	
Control Delay		5.4			6.7		14.6	10.6		17.6	12.6	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		5.4			6.7		14.6	10.6		17.6	12.6	
LOS		A			A		B	B		B	B	
Approach Delay		5.4			6.7			10.8			16.4	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)		33			61		2	13		13	3	
Queue Length 95th (ft)		65			119		14	62		48	19	
Internal Link Dist (ft)		1020			146			471			291	
Turn Bay Length (ft)							50			75		
Base Capacity (vph)		2572			2496		739	959		668	997	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.24			0.41		0.02	0.19		0.11	0.03	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 38.2
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 7.2 Intersection LOS: A
Intersection Capacity Utilization 72.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 27: Boundary Street & Franklin Street



UNC DP TIA 2023 — Existing (2023) PM
28: Park Place & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	703	2	21	927	0	57
Future Volume (vph)	703	2	21	927	0	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	9	12
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt					0.865	
Flt Protected				0.999		
Satd. Flow (prot)	3539	0	0	3536	1450	0
Flt Permitted				0.999		
Satd. Flow (perm)	3539	0	0	3536	1450	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	461			1129	375	
Travel Time (s)	12.6			30.8	10.2	
Confl. Peds. (#/hr)		11	11			
Confl. Bikes (#/hr)		6				4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	781	2	23	1030	0	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	783	0	0	1053	63	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.8%		ICU Level of Service A	
Analysis Period (min) 15			

UNC DP TIA 2023 — Existing (2023) PM
28: Park Place & Franklin Street — HCM 2010 TWSC

Intersection

Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	703	2	21	927	0	57
Future Vol, veh/h	703	2	21	927	0	57
Conflicting Peds, #/hr	0	11	11	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	781	2	23	1030	0	63

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	794	0	1354	403
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	561	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	823	-	141	597
Stage 1	-	-	-	-	406	-
Stage 2	-	-	-	-	535	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	817	-	131	593
Mov Cap-2 Maneuver	-	-	-	-	131	-
Stage 1	-	-	-	-	403	-
Stage 2	-	-	-	-	500	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	593	-	-	817	-
HCM Lane V/C Ratio	0.107	-	-	0.029	-
HCM Control Delay (s)	11.8	-	-	9.5	0.3
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

UNC DP TIA 2023 — Existing (2023) PM
29: Battle Lane & Boundary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	63	33	0	0	139	102	1	85	22
Future Volume (vph)	0	0	0	63	33	0	0	139	102	1	85	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt								0.943			0.973	
Flt Protected					0.968							
Satd. Flow (prot)	0	0	0	0	1803	0	0	1757	0	0	1812	0
Flt Permitted					0.968							
Satd. Flow (perm)	0	0	0	0	1803	0	0	1757	0	0	1812	0
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		81			509			63			394	
Travel Time (s)		1.8			13.9			1.7			10.7	
Confl. Peds. (#/hr)			88			34	2		56	56		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	70	37	0	0	154	113	1	94	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	107	0	0	267	0	0	119	0
Sign Control		Stop			Stop			Yield			Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.9%		ICU Level of Service A	
Analysis Period (min) 15			

UNC DP TIA 2023 — Existing (2023) PM
30: Country Club Road & Battle Lane — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	91	398	402	241	148	0
Future Volume (vph)	91	398	402	241	148	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.949			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1768	0	1770	0
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1768	0	1770	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		90	508		63	
Travel Time (s)		2.5	13.9		1.7	
Confl. Peds. (#/hr)	34			56		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	101	442	447	268	164	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	101	442	715	0	164	0
Sign Control		Free	Free		Yield	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 60.7%		ICU Level of Service B	
Analysis Period (min) 15			

UNC DP TIA 2023 — Existing (2023) PM
31: Country Club Road & Paul Green Theater Drive/Gimghoul Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	2	59	11	2	9	20	581	5	7	497	19
Future Volume (vph)	28	2	59	11	2	9	20	581	5	7	497	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			2%			1%			1%	
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96			0.97		0.96	1.00			0.99	
Frt		0.910			0.944			0.999			0.995	
Flt Protected		0.985			0.976		0.950				0.999	
Satd. Flow (prot)	0	1668	0	0	1656	0	1761	1851	0	0	1832	0
Flt Permitted		0.886			0.791		0.472				0.991	
Satd. Flow (perm)	0	1484	0	0	1332	0	839	1851	0	0	1817	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66			10			1			5	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		153			324			421			824	
Travel Time (s)		4.2			8.8			11.5			22.5	
Confl. Peds. (#/hr)	16		9	9		16	43		6	6		43
Confl. Bikes (#/hr)						3						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	31	2	66	12	2	10	22	646	6	8	552	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	99	0	0	24	0	22	652	0	0	581	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2	2	
Detector Phase	8	8		4	4		6	6		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	21.0	21.0		18.6	18.6		15.1	15.1		15.1	15.1	
Total Split (s)	21.0	21.0		21.0	21.0		39.0	39.0		39.0	39.0	
Total Split (%)	35.0%	35.0%		35.0%	35.0%		65.0%	65.0%		65.0%	65.0%	
Maximum Green (s)	15.0	15.0		15.4	15.4		33.9	33.9		33.9	33.9	
Yellow Time (s)	3.5	3.5		3.1	3.1		3.1	3.1		3.1	3.1	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-0.6		-0.1	-0.1			-0.1	
Total Lost Time (s)		5.0			5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	11.0	11.0		9.0	9.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		8.6			8.5		25.5	25.5			25.5	
Actuated g/C Ratio		0.22			0.21		0.64	0.64			0.64	

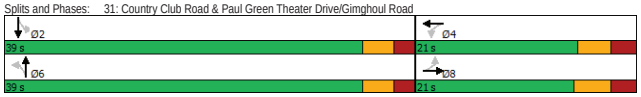
UNC DP TIA 2023 — Existing (2023) PM
31: Country Club Road & Paul Green Theater Drive/Gimghoul Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.27			0.08		0.04	0.55			0.50	
Control Delay		9.1			11.6		4.8	8.2			7.6	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		9.1			11.6		4.8	8.2			7.6	
LOS		A			B		A	A			A	
Approach Delay		9.1			11.6			8.1			7.6	
Approach LOS		A			B			A			A	
Queue Length 50th (ft)		5			2		2	84			70	
Queue Length 95th (ft)		37			17		9	178			149	
Internal Link Dist (ft)		73			244			341			744	
Turn Bay Length (ft)							50					
Base Capacity (vph)		654			558		718	1585			1557	
Starvation Cap Reductn		0			0		0	13			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.15			0.04		0.03	0.41			0.37	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 39.6
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 8.0 — Intersection LOS: A
Intersection Capacity Utilization 49.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 31: Country Club Road & Paul Green Theater Drive/Gimghoul Road



UNC DP TIA 2023 — Existing (2023) PM
32: Hibbard Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	542	9	17	507	38	21	2	39	27	21	60
Future Volume (vph)	27	542	9	17	507	38	21	2	39	27	21	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			2%			-5%			-2%	
Storage Length (ft)	150		0	75		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.81	0.99		0.76	0.96			0.75			0.86	
Frt		0.998			0.990			0.915			0.925	
Flt Protected	0.950			0.950				0.983			0.988	
Satd. Flow (prot)	1778	3517	0	1752	3323	0	0	1321	0	0	1610	0
Flt Permitted	0.415			0.420				0.718			0.887	
Satd. Flow (perm)	631	3517	0	591	3323	0	0	940	0	0	1331	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			8			43			51	
Link Speed (mph)		25			25			25			20	
Link Distance (ft)		469			330			188			294	
Travel Time (s)		12.8			9.0			5.1			10.0	
Confl. Peds. (#/hr)	259		155	155		259	59		354	354		59
Confl. Bikes (#/hr)			1			2						6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	30	602	10	19	563	42	23	2	43	30	23	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	612	0	19	605	0	0	68	0	0	120	0
Turn Type	D.P+P	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.3	18.5		22.5	22.5		29.3	29.3		29.3	29.3	
Total Split (s)	17.0	85.0		68.0	68.0		45.0	45.0		45.0	45.0	
Total Split (%)	13.1%	65.4%		52.3%	52.3%		34.6%	34.6%		34.6%	34.6%	
Maximum Green (s)	11.7	79.5		62.5	62.5		38.7	38.7		38.7	38.7	
Yellow Time (s)	3.0	3.2		3.2	3.2		3.5	3.5		3.0	3.0	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.8	2.8		3.3	3.3	
Lost Time Adjust (s)	-0.1	-0.3		-0.4	-0.4			-1.3			-1.3	
Total Lost Time (s)	5.2	5.2		5.1	5.1			5.0			5.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		6.0		10.0	10.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	103.6	106.7		99.4	99.4			13.1			13.1	
Actuated g/C Ratio	0.80	0.82		0.76	0.76			0.10			0.10	

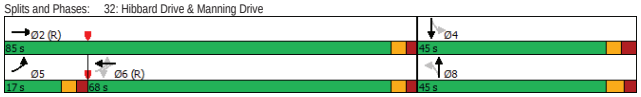
UNC DP TIA 2023 — Existing (2023) PM
32: Hibbard Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.05	0.21		0.04	0.24			0.51			0.67	
Control Delay	3.3	3.0		6.1	4.8			37.5			49.8	
Queue Delay	0.0	0.2		0.0	0.0			0.0			0.0	
Total Delay	3.3	3.3		6.1	4.8			37.5			49.8	
LOS	A	A		A	A			D			D	
Approach Delay		3.3			4.8			37.5			49.8	
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	3	51		3	77			20			56	
Queue Length 95th (ft)	m11	98		14	108			66			119	
Internal Link Dist (ft)		389			250			108			214	
Turn Bay Length (ft)	150			75								
Base Capacity (vph)	620	2886		451	2541			319			444	
Starvation Cap Reductn	0	1475		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.05	0.43		0.04	0.24			0.21			0.27	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 56 (43%), Referenced to phase 2:EBT and 6:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 9.4 — Intersection LOS: A
Intersection Capacity Utilization 50.1% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 32: Hibbard Drive & Manning Drive



UNC DP TIA 2023 — Existing (2023) PM
33: Paul Harden Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	745	17	23	418	27	33	7	144	20	15	12
Future Volume (vph)	15	745	17	23	418	27	33	7	144	20	15	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	12	10	10	12
Grade (%)		-2%			2%			8%			-11%	
Storage Length (ft)	200		0	0		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.89	1.00		0.98	0.98		0.71	0.67		0.76	0.87	
Frt		0.997			0.991			0.857			0.935	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3551	0	1752	3411	0	1586	961	0	1742	1486	0
Flt Permitted	0.471			0.316			0.738			0.339		
Satd. Flow (perm)	786	3551	0	570	3411	0	877	961	0	472	1486	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			7			160			13	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		433			267			379			301	
Travel Time (s)		11.8			7.3			10.3			8.2	
Confl. Peds. (#/hr)	72		38	38		72	185		290	290		185
Confl. Bikes (#/hr)			2			1			3			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	828	19	26	464	30	37	8	160	22	17	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	17	847	0	26	494	0	37	168	0	22	30	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.9	23.1		11.9	22.1		28.8	28.8		30.3	30.3	
Total Split (s)	25.0	67.0		25.0	67.0		38.0	38.0		38.0	38.0	
Total Split (%)	19.2%	51.5%		19.2%	51.5%		29.2%	29.2%		29.2%	29.2%	
Maximum Green (s)	20.1	61.9		20.1	61.9		32.2	32.2		31.7	31.7	
Yellow Time (s)	3.0	3.3		3.0	3.3		3.0	3.0		3.5	3.5	
All-Red Time (s)	1.9	1.8		1.9	1.8		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.2	-0.1		0.1	0.1		-0.4	-0.4		-0.9	-0.9	
Total Lost Time (s)	5.1	5.0		5.0	5.2		5.4	5.4		5.4	5.4	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			10.0		16.0	16.0		17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	105.6	100.6		104.8	102.8		11.8	11.8		11.8	11.8	

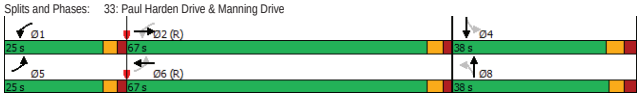
UNC DP TIA 2023 — Existing (2023) PM
33: Paul Harden Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.81	0.77		0.81	0.79		0.09	0.09		0.09	0.09	
v/c Ratio	0.02	0.31		0.05	0.18		0.47	0.72		0.52	0.20	
Control Delay	2.7	5.1		2.4	3.5		72.9	27.1		94.0	37.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.7	5.1		2.4	3.5		72.9	27.1		94.0	37.4	
LOS	A	A		A	A		E	C		F	D	
Approach Delay		5.1			3.4			35.4			61.3	
Approach LOS		A			A			D			E	
Queue Length 50th (ft)	2	107		2	22		30	6		18	14	
Queue Length 95th (ft)	8	134		9	84		64	81		47	42	
Internal Link Dist (ft)		353			187			299			221	
Turn Bay Length (ft)	200						75			100		
Base Capacity (vph)	804	2749		654	2698		219	360		118	382	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.02	0.31		0.04	0.18		0.17	0.47		0.19	0.08	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 88 (68%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 10.1 — Intersection LOS: B
Intersection Capacity Utilization 49.9% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 33: Paul Harden Drive & Manning Drive



UNC DP TIA 2023 — Existing (2023) PM
34: East Drive & Dogwood Deck Entrance/Jackson Circle — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	1	0	6	7	518	1	4	59	80
Future Volume (vph)	0	0	0	1	0	6	7	518	1	4	59	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	12	12	10	12	12
Storage Length (ft)	0		0	0		0	100		0	75		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.882						0.914	
Flt Protected					0.994		0.950			0.950		
Satd. Flow (prot)	0	0	0	0	1633	0	1652	1863	0	1652	1703	0
Flt Permitted					0.994		0.950			0.950		
Satd. Flow (perm)	0	0	0	0	1633	0	1652	1863	0	1652	1703	0
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		321			259			210			315	
Travel Time (s)		7.3			7.1			5.7			8.6	
Confl. Peds. (#/hr)	21		3	3		21	13					13
Confl. Bikes (#/hr)												3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1	0	7	8	576	1	4	66	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	8	0	8	577	0	4	155	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 42.4% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
34: East Drive & Dogwood Deck Entrance/Jackson Circle — HCM 2010 TWSC

Intersection

Int Delay, s/veh 0.3

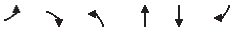
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	0	6	7	518	1	4	59	80
Future Vol, veh/h	0	0	0	1	0	6	7	518	1	4	59	80
Conflicting Peds, #/hr	21	0	3	3	0	21	13	0	0	0	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-2	62	144	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	1	0	7	8	576	1	4	66	89

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	715	769	598	168	0	0	577	0	0
Stage 1	593	593	-	-	-	-	-	-	-
Stage 2	122	176	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	397	332	502	1410	-	-	996	-	-
Stage 1	552	493	-	-	-	-	-	-	-
Stage 2	903	753	-	-	-	-	-	-	-
Platoon blocked, %						-		-	-
Mov Cap-1 Maneuver	392	0	493	1410	-	-	996	-	-
Mov Cap-2 Maneuver	392	0	-	-	-	-	-	-	-
Stage 1	549	0	-	-	-	-	-	-	-
Stage 2	898	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0.1	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1410	-	-	475	996	-	-
HCM Lane V/C Ratio	0.006	-	-	0.016	0.004	-	-
HCM Control Delay (s)	7.6	-	-	12.7	8.6	-	-
HCM Lane LOS	A	-	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	-	-

UNC DP TIA 2023 — Existing (2023) PM
35: East Drive & Dogwood Deck Exit — Lanes, Volumes, Timings



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	232	156	0	207	60	0
Future Volume (vph)	232	156	0	207	60	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1770	1583	0	1863	1863	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	1583	0	1863	1863	0
Link Speed (mph)	30			25	30	
Link Distance (ft)	134			176	210	
Travel Time (s)	3.0			4.8	4.8	
Confl. Peds. (#/hr)	2	3	15			15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	258	173	0	230	67	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	258	173	0	230	67	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.5%		ICU Level of Service A	
Analysis Period (min) 15			

UNC DP TIA 2023 — Existing (2023) PM
35: East Drive & Dogwood Deck Exit — HCM 2010 TWSC

Intersection

Int Delay, s/veh	6.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	232	156	0	207	60	0
Future Vol, veh/h	232	156	0	207	60	0
Conflicting Peds, #/hr	2	3	15	0	0	15
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	258	173	0	230	67	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	299	70	-	0	-	0
Stage 1	67	-	-	-	-	-
Stage 2	232	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	692	993	0	-	-	0
Stage 1	956	-	0	-	-	0
Stage 2	807	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	692	991	-	-	-	-
Mov Cap-2 Maneuver	692	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	807	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	692	991	-
HCM Lane V/C Ratio	-	0.373	0.175	-
HCM Control Delay (s)	-	13.3	9.4	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	1.7	0.6	-

UNC DP TIA 2023 — Existing (2023) PM
36: Mason Farm Road & Hibbard Drive — Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	164	1	0	74	34	3	3	10	129	0	37
Future Volume (vph)	16	164	1	0	74	34	3	3	10	129	0	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.957			0.913			0.970	
Flt Protected		0.996						0.991			0.963	
Satd. Flow (prot)	0	1792	0	0	1723	0	0	1573	0	0	1624	0
Flt Permitted		0.996						0.991			0.963	
Satd. Flow (perm)	0	1792	0	0	1723	0	0	1573	0	0	1624	0
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		221			213			480			560	
Travel Time (s)		6.0			5.8			10.9			15.3	
Confl. Peds. (#/hr)							33		73	73		33
Confl. Bikes (#/hr)						8			1			10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	18	182	1	0	82	38	3	3	11	143	0	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	201	0	0	120	0	0	17	0	0	184	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.6%		ICU Level of Service A	
Analysis Period (min) 15			

UNC DP TIA 2023 — Existing (2023) PM
36: Mason Farm Road & Hibbard Drive — HCM 2010 TWSC

Intersection

Int Delay, s/veh	13.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	164	1	0	74	34	3	3	10	129	0	37
Future Vol, veh/h	16	164	1	0	74	34	3	3	10	129	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0	33	0	73	73	0	33
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	182	1	0	82	38	3	3	11	143	0	41

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	415	433	54	486	448	82	74	0	0	87	0	0
Stage 1	340	340	-	88	88	-	-	-	-	-	-	-
Stage 2	75	93	-	398	360	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	548	516	1013	492	506	978	1526	-	-	1509	-	-
Stage 1	675	639	-	920	822	-	-	-	-	-	-	-
Stage 2	934	818	-	628	626	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	401	425	987	286	417	923	1488	-	-	1425	-	-
Mov Cap-2 Maneuver	401	425	-	286	417	-	-	-	-	-	-	-
Stage 1	657	559	-	867	774	-	-	-	-	-	-	-
Stage 2	799	771	-	379	548	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.9	14.4	1.4	6.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1488	-	-	424	504	1425	-	-
HCM Lane V/C Ratio	0.002	-	-	0.474	0.238	0.101	-	-
HCM Control Delay (s)	7.4	0	-	20.9	14.4	7.8	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.5	0.9	0.3	-	-

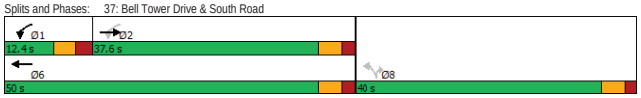
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	314	33	36	350	128	102
Future Volume (vph)	314	33	36	350	128	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	50		0	100
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.95		0.80		0.35	0.62
Frt	0.987					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1746	0	1770	1863	1770	1583
Flt Permitted			0.420		0.950	
Satd. Flow (perm)	1746	0	624	1863	620	987
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	7					113
Link Speed (mph)	25			25	30	
Link Distance (ft)	696			744	512	
Travel Time (s)	19.0			20.3	11.6	
Confl. Peds. (#/hr)		199	199		472	135
Confl. Bikes (#/hr)		16				10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	349	37	40	389	142	113
Shared Lane Traffic (%)						
Lane Group Flow (vph)	386	0	40	389	142	113
Turn Type	NA		D.P+P	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			2		8	8
Detector Phase	2		1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	7.0	7.0
Minimum Split (s)	22.4		12.4	15.4	22.5	22.5
Total Split (s)	37.6		12.4	50.0	40.0	40.0
Total Split (%)	41.8%		13.8%	55.6%	44.4%	44.4%
Maximum Green (s)	32.2		7.0	44.6	34.9	34.9
Yellow Time (s)	3.3		3.0	3.3	3.4	3.4
All-Red Time (s)	2.1		2.4	2.1	1.7	1.7
Lost Time Adjust (s)	-0.5		-0.4	-0.4	-0.1	-0.1
Total Lost Time (s)	4.9		5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?			Yes			
Vehicle Extension (s)	3.0		1.0	3.0	2.0	2.0
Recall Mode	Min		None	Min	None	None
Walk Time (s)	7.0				7.0	7.0
Flash Dont Walk (s)	10.0				10.0	10.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	23.6		25.6	27.0	18.9	18.9
Actuated g/C Ratio	0.41		0.45	0.47	0.33	0.33
v/c Ratio	0.53		0.09	0.44	0.70	0.28

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	19.7		10.7	13.2	37.6	6.0
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	19.7		10.7	13.2	37.6	6.0
LOS	B		B	B	D	A
Approach Delay	19.7			12.9	23.6	
Approach LOS	B			B	C	
Queue Length 50th (ft)	76		6	78	29	0
Queue Length 95th (ft)	268		27	203	133	33
Internal Link Dist (ft)	616			664	432	
Turn Bay Length (ft)			50			100
Base Capacity (vph)	1136		447	1514	423	709
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.34		0.09	0.26	0.34	0.16

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 57.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 17.9 — Intersection LOS: B
Intersection Capacity Utilization 51.6% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 37: Bell Tower Drive & South Road



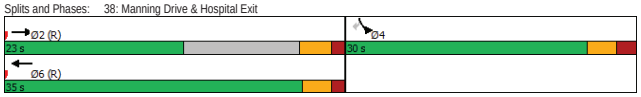
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	210	508	0	73	49
Future Volume (vph)	0	210	508	0	73	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					0.97	0.97
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3539	3539	0	1770	1583
Flt Permitted					0.950	
Satd. Flow (perm)	0	3539	3539	0	1711	1537
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						54
Link Speed (mph)		35	35		20	
Link Distance (ft)		334	382		292	
Travel Time (s)		6.5	7.4		10.0	
Confl. Peds. (#/hr)	165			165	44	23
Confl. Bikes (#/hr)				1		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	233	564	0	81	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	233	564	0	81	54
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		10.0	10.0		7.0	7.0
Minimum Split (s)		14.7	19.4		31.1	31.1
Total Split (s)		23.0	35.0		30.0	30.0
Total Split (%)		35.4%	53.8%		46.2%	46.2%
Maximum Green (s)		18.3	30.6		24.9	24.9
Yellow Time (s)		3.3	3.0		3.0	3.0
All-Red Time (s)		1.4	1.4		2.1	2.1
Lost Time Adjust (s)		0.3	0.6		-0.1	-0.1
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		2.0	2.0		2.0	2.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		19.0	19.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		50.2	50.2		8.2	8.2
Actuated g/C Ratio		0.77	0.77		0.13	0.13
v/c Ratio		0.09	0.21		0.36	0.22
Control Delay		2.9	2.4		30.2	10.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		2.9	2.4		30.2	10.5

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
LOS		A	A		C	B
Approach Delay		2.9	2.4		22.3	
Approach LOS		A	A		C	
Queue Length 50th (ft)		15	62		30	0
Queue Length 95th (ft)		34	20		64	27
Internal Link Dist (ft)		254	302		212	
Turn Bay Length (ft)						
Base Capacity (vph)		2732	2732		680	624
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.09	0.21		0.12	0.09

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 24 (37%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 5.4 — Intersection LOS: A
Intersection Capacity Utilization 36.7% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 38: Manning Drive & Hospital Exit



UNC DP TIA 2023 — Existing (2023) PM
39: Craige Deck & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	569	11	15	411	99	201
Future Volume (vph)	569	11	15	411	99	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.997					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3529	0	1770	3539	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3529	0	1770	3539	1770	1583
Link Speed (mph)	25			25	15	
Link Distance (ft)	330			433	367	
Travel Time (s)	9.0			11.8	16.7	
Confl. Peds. (#/hr)		46	46		3	
Confl. Bikes (#/hr)		6				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	632	12	17	457	110	223
Shared Lane Traffic (%)						
Lane Group Flow (vph)	644	0	17	457	110	223
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 35.3% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
39: Craige Deck & Manning Drive — HCM 2010 TWSC

Intersection
Int Delay, s/veh 4.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	569	11	15	411	99	201
Future Vol, veh/h	569	11	15	411	99	201
Conflicting Peds, #/hr	0	46	46	0	3	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	632	12	17	457	110	223

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	690	0	950	368
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	900	-	258	629
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	754	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	866	-	243	605
Mov Cap-2 Maneuver	-	-	-	-	243	-
Stage 1	-	-	-	-	444	-
Stage 2	-	-	-	-	737	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	20
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	243	605	-	-	866	-
HCM Lane V/C Ratio	0.453	0.369	-	-	0.019	-
HCM Control Delay (s)	31.5	14.4	-	-	9.2	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	2.2	1.7	-	-	0.1	-

UNC DP TIA 2023 — Existing (2023) PM
101: US 15/501 & Estes Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	5	359	5	6	9	254	1440	2	11	1219	105
Future Volume (vph)	196	5	359	5	6	9	254	1440	2	11	1219	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		0	150		0	250		0	220		225
Storage Lanes	0		2	0		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.94	0.98		0.96							0.99
Frt			0.850		0.941							0.850
Flt Protected		0.954			0.987		0.950			0.950		
Satd. Flow (prot)	0	1760	2760	0	1638	0	3400	3505	0	1752	3505	1568
Flt Permitted		0.954			0.987		0.950			0.950		
Satd. Flow (perm)	0	1658	2701	0	1638	0	3400	3505	0	1752	3505	1548
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			282		10							80
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		1824			872			1606			1920	
Travel Time (s)		41.5			19.8			24.3			29.1	
Confl. Peds. (#/hr)	21					21						
Confl. Bikes (#/hr)			1			2						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	218	6	399	6	7	10	282	1600	2	12	1354	117
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	224	399	0	23	0	282	1602	0	12	1354	117
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	3	3	5	4	4		5	2		1	6	3
Permitted Phases			3									6
Detector Phase	3	3	5	4	4		5	2		1	6	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.6	13.6	13.7	13.7	13.7		13.7	18.1		13.5	18.1	13.6
Total Split (s)	25.0	25.0	41.0	20.0	20.0		41.0	120.0		15.0	94.0	25.0
Total Split (%)	13.9%	13.9%	22.8%	11.1%	11.1%		22.8%	66.7%		8.3%	52.2%	13.9%
Maximum Green (s)	18.4	18.4	34.3	13.3	13.3		34.3	113.9		8.5	87.9	18.4
Yellow Time (s)	3.8	3.8	3.0	3.2	3.2		3.0	4.4		3.0	4.6	3.8
All-Red Time (s)	2.8	2.8	3.7	3.5	3.5		3.7	1.7		3.5	1.5	2.8
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.6	6.7		6.7		6.7	6.1		6.5	6.1	6.6
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	3.0	1.0	1.0		3.0	6.0		3.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)		18.4	38.9		7.2		20.6	134.5		7.6	113.2	131.1

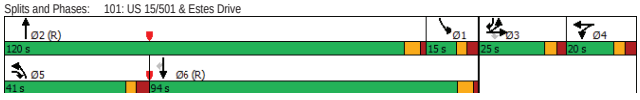
UNC DP TIA 2023 — Existing (2023) PM
101: US 15/501 & Estes Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.10	0.22		0.04		0.11	0.75		0.04	0.63	0.73
v/c Ratio		1.25	0.49		0.31		0.72	0.61		0.16	0.61	0.10
Control Delay		211.1	15.0		66.3		87.7	13.7		68.5	18.6	1.5
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		211.1	15.0		66.3		87.7	13.7		68.5	18.6	1.5
LOS		F	B		E		F	B		E	B	A
Approach Delay		85.5			66.3			24.8			17.7	
Approach LOS		F			E			C			B	
Queue Length 50th (ft)		~328	55		15		169	418		14	316	11
Queue Length 95th (ft)		#516	100		50		216	665		m23	271	2
Internal Link Dist (ft)		1744			792			1526			1840	
Turn Bay Length (ft)							250			220		225
Base Capacity (vph)		179	1000		130		647	2619		82	2204	1151
Starvation Cap Reductn		0	0		0		0	0		0	0	0
Spillback Cap Reductn		0	0		0		0	0		0	0	0
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		1.25	0.40		0.18		0.44	0.61		0.15	0.61	0.10

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 68 (38%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.25
Intersection Signal Delay: 31.8 — Intersection LOS: C
Intersection Capacity Utilization 79.5% — ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: US 15/501 & Estes Drive



UNC DP TIA 2023 — Existing (2023) PM
102: US 15/501 & Willow Drive — Lanes, Volumes, Timings

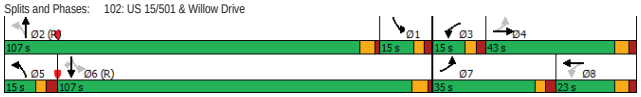
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	24	21	32	39	30	103	1451	81	41	1247	226
Future Volume (vph)	141	24	21	32	39	30	103	1451	81	41	1247	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	220		0	220		260
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.99		0.99	0.99							0.97
Frt		0.931			0.935			0.992				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1695	0	1752	1714	0	1752	3477	0	1752	3505	1568
Flt Permitted	0.405			0.724			0.114			0.087		
Satd. Flow (perm)	747	1695	0	1320	1714	0	210	3477	0	160	3505	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			17			5				179
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		1227			1197			1920			792	
Travel Time (s)		33.5			32.6			29.1			12.0	
Confl. Peds. (#/hr)			6	6			2					2
Confl. Bikes (#/hr)			4			1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	157	27	23	36	43	33	114	1612	90	46	1386	251
Shared Lane Traffic (%)												
Lane Group Flow (vph)	157	50	0	36	76	0	114	1702	0	46	1386	251
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	12.0
Minimum Split (s)	15.0	33.0		15.0	33.0		15.0	90.0		15.0	80.0	80.0
Total Split (s)	35.0	43.0		15.0	23.0		15.0	107.0		15.0	107.0	107.0
Total Split (%)	19.4%	23.9%		8.3%	12.8%		8.3%	59.4%		8.3%	59.4%	59.4%
Maximum Green (s)	28.7	36.6		9.1	16.6		8.9	100.9		9.4	100.9	100.9
Yellow Time (s)	3.0	3.9		3.0	3.9		3.0	4.6		3.0	4.6	4.6
All-Red Time (s)	3.3	2.5		2.9	2.5		3.1	1.5		2.6	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.4		5.9	6.4		6.1	6.1		5.6	6.1	6.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Walk Time (s)		4.0									5.0	5.0
Flash Dont Walk (s)		22.0									9.0	9.0
Pedestrian Calls (#/hr)		0									0	0
Act Effct Green (s)	34.9	22.4		19.3	10.9		118.1	118.1		115.3	114.8	114.8

UNC DP TIA 2023 — Existing (2023) PM
102: US 15/501 & Willow Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.19	0.12		0.11	0.06		0.66	0.66		0.64	0.64	0.64
v/c Ratio	0.61	0.22		0.23	0.64		0.53	0.75		0.25	0.62	0.24
Control Delay	72.1	43.0		58.2	86.4		21.6	18.2		42.7	31.6	13.1
Queue Delay	3.2	0.0		0.0	0.1		0.0	0.9		0.0	0.9	0.0
Total Delay	75.3	43.0		58.2	86.5		21.6	19.1		42.7	32.5	13.1
LOS	E	D		E	F		C	B		D	C	B
Approach Delay		67.5			77.4			19.3			29.9	
Approach LOS		E			E			B			C	
Queue Length 50th (ft)	164	31		35	69		41	797		21	510	38
Queue Length 95th (ft)	221	72		65	128		m56	m970		m66	942	240
Internal Link Dist (ft)		1147			1117			1840			712	
Turn Bay Length (ft)	200						220			220		260
Base Capacity (vph)	317	361		172	173		220	2282		185	2235	1032
Starvation Cap Reductn	0	0		0	0		0	0		0	526	0
Spillback Cap Reductn	87	0		0	3		0	301		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.68	0.14		0.21	0.45		0.52	0.86		0.25	0.81	0.24

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 65 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 28.3 — Intersection LOS: C
Intersection Capacity Utilization 79.4% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: US 15/501 & Willow Drive



UNC DP TIA 2023 — Existing (2023) PM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	104	80	217	61	77	137	209	1294	169	6	100	1124
Future Volume (vph)	104	80	217	61	77	137	209	1294	169	6	100	1124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	525		150	350		150	350		175		225	
Storage Lanes	1		1	2		1	1		1		1	
Taper Length (ft)	25			25			25				25	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt			0.850			0.850			0.850			
Flt Protected	0.950			0.950			0.950				0.950	
Satd. Flow (prot)	1752	1863	1568	3433	1863	1583	1752	3505	1583	0	1769	3505
Flt Permitted	0.950			0.950			0.138				0.118	
Satd. Flow (perm)	1752	1863	1568	3433	1863	1583	255	3505	1583	0	220	3505
Right Turn on Red			Yes			Yes			Yes			
Satd. Flow (RTOR)			61			138			99			
Link Speed (mph)		30			30			45				45
Link Distance (ft)		828			647			792				1376
Travel Time (s)		18.8			14.7			12.0				20.8
Peak Hour Factor	0.90	0.92	0.90	0.92	0.92	0.92	0.90	0.90	0.92	0.90	0.92	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	103%	100%	100%
Heavy Vehicles (%)	3%	2%	3%	2%	2%	2%	3%	3%	2%	3%	2%	3%
Adj. Flow (vph)	116	87	241	66	84	149	232	1438	184	7	109	1249
Shared Lane Traffic (%)												
Lane Group Flow (vph)	116	87	241	66	84	149	232	1438	184	0	116	1249
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	7	4	5	3	8	1!	5	2	3	1!	1	6
Permitted Phases			4			8	6		2	2	2	
Detector Phase	7	4	5	3	8	1	5	2	3	1	1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	12.0
Minimum Split (s)	13.4	43.5	13.3	13.6	40.5	13.4	13.3	42.5	13.6	13.4	13.4	36.5
Total Split (s)	24.0	50.4	33.0	14.2	40.6	19.8	33.0	95.6	14.2	19.8	19.8	82.4
Total Split (%)	13.3%	28.0%	18.3%	7.9%	22.6%	11.0%	18.3%	53.1%	7.9%	11.0%	11.0%	45.8%
Maximum Green (s)	17.6	43.9	26.7	7.6	34.1	13.4	26.7	89.1	7.6	13.4	13.4	75.9
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.5	3.0	3.0	3.0	4.5
All-Red Time (s)	3.4	2.7	3.3	3.6	2.7	3.4	3.3	2.0	3.6	3.4	3.4	2.0
Lost Time Adjust (s)	-1.4	-1.5	-1.3	-1.6	-1.5	-1.4	-1.3	-1.5	-1.6		-1.4	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?				Yes		Yes			Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	45.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	None	C-Min
Walk Time (s)		7.0			7.0			7.0				7.0
Flash Dont Walk (s)		30.0			27.0			29.0				23.0
Pedestrian Calls (#/hr)		0			0			0				0
Act Effct Green (s)	17.1	21.4	52.3	9.7	14.0	32.3	128.9	115.6	130.3		128.9	103.0

UNC DP TIA 2023 — Existing (2023) PM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

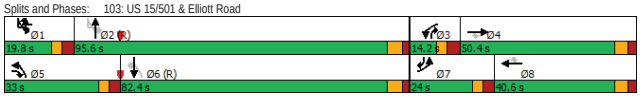
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	128
Future Volume (vph)	128
Ideal Flow (vphpl)	1900
Storage Length (ft)	100
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1568
Flt Permitted	
Satd. Flow (perm)	1568
Right Turn on Red	Yes
Satd. Flow (RTOR)	98
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Growth Factor	100%
Heavy Vehicles (%)	3%
Adj. Flow (vph)	142
Shared Lane Traffic (%)	
Lane Group Flow (vph)	142
Turn Type	pm+ov
Protected Phases	7
Permitted Phases	6
Detector Phase	7
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	13.4
Total Split (s)	24.0
Total Split (%)	13.3%
Maximum Green (s)	17.6
Yellow Time (s)	3.0
All-Red Time (s)	3.4
Lost Time Adjust (s)	-1.4
Total Lost Time (s)	5.0
Lead/Lag	Lead
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Minimum Gap (s)	2.0
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	None
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	125.1

UNC DP TIA 2023 — Existing (2023) PM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Actuated g/C Ratio	0.10	0.12	0.29	0.05	0.08	0.18	0.72	0.64	0.72		0.72	0.57
v/c Ratio	0.70	0.39	0.48	0.36	0.58	0.38	0.58	0.64	0.16		0.43	0.62
Control Delay	100.3	76.8	40.2	87.3	95.3	12.8	21.7	42.8	11.7		12.8	20.6
Queue Delay	0.0	0.0	0.3	4.1	0.0	0.0	0.0	4.6	0.0		0.0	0.1
Total Delay	100.3	76.8	40.5	91.4	95.3	12.8	21.7	47.4	11.7		12.8	20.7
LOS	F	E	D	F	F	B	C	D	B		B	C
Approach Delay		63.2			53.3			40.6				18.6
Approach LOS		E			D			D				B
Queue Length 50th (ft)	135	96	175	39	98	11	160	813	83		13	519
Queue Length 95th (ft)	208	153	240	68	158	75	271	852	m144		m30	784
Internal Link Dist (ft)		748			567			712				1296
Turn Bay Length (ft)	525		150	350		150	350		175		225	
Base Capacity (vph)	191	469	525	190	368	415	428	2250	1175		293	2006
Starvation Cap Reductn	0	0	0	0	0	0	0	728	0		0	0
Spillback Cap Reductn	0	0	45	72	0	0	0	0	0		0	140
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.61	0.19	0.50	0.56	0.23	0.36	0.54	0.94	0.16		0.40	0.67

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 35.9 — Intersection LOS: D
Intersection Capacity Utilization 72.6% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 103: US 15/501 & Elliott Road



UNC DP TIA 2023 — Existing (2023) PM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	SBR
Actuated g/C Ratio	0.70
v/c Ratio	0.13
Control Delay	4.3
Queue Delay	0.0
Total Delay	4.3
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	m113
Internal Link Dist (ft)	
Turn Bay Length (ft)	100
Base Capacity (vph)	1140
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.12

Intersection Summary

UNC DP TIA 2023 — Existing (2023) PM
104: US 15/501 & Eastgate/Ephesus Church Road — Lanes, Volumes, Timings

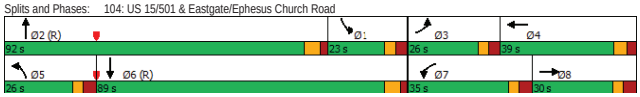
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	49	118	240	74	24	177	1093	218	59	891	25
Future Volume (vph)	116	49	118	240	74	24	177	1093	218	59	891	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	260		200	220		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	0.99				0.99		1.00		0.98	1.00	1.00	
Frt		0.894			0.963				0.850		0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1649	0	3400	1763	0	1752	3505	1568	1752	3489	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1726	1649	0	3400	1763	0	1751	3505	1536	1751	3489	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		56			8				227		2	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		448			1242			1376			811	
Travel Time (s)		12.2			33.9			20.8			12.3	
Confl. Peds. (#/hr)	10					10	1		1	1		1
Confl. Bikes (#/hr)						2						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	129	54	131	267	82	27	197	1214	242	66	990	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	129	185	0	267	109	0	197	1214	242	66	1018	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Free	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									Free			
Detector Phase	3	8		7	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	20.0	36.9		33.8	37.7		20.0	80.0		18.0	68.0	
Total Split (s)	26.0	30.0		35.0	39.0		26.0	92.0		23.0	89.0	
Total Split (%)	14.4%	16.7%		19.4%	21.7%		14.4%	51.1%		12.8%	49.4%	
Maximum Green (s)	19.6	23.1		28.2	32.3		19.2	85.2		16.3	82.3	
Yellow Time (s)	3.0	3.0		3.0	3.8		3.0	4.5		3.0	4.5	
All-Red Time (s)	3.4	3.9		3.8	2.9		3.8	2.3		3.7	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.9		6.8	6.7		6.8	6.8		6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.0	2.0		4.0	6.0		2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	60.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	

UNC DP TIA 2023 — Existing (2023) PM
104: US 15/501 & Eastgate/Ephesus Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		23.0			24.0			17.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	16.6	19.6		19.4	23.0		27.4	97.5	180.0	16.3	86.5	
Actuated g/C Ratio	0.09	0.11		0.11	0.13		0.15	0.54	1.00	0.09	0.48	
v/c Ratio	0.80	0.81		0.73	0.47		0.74	0.64	0.16	0.42	0.61	
Control Delay	112.6	79.1		89.4	72.7		84.3	45.7	0.2	87.7	38.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	112.6	79.1		89.4	72.7		84.3	45.7	0.2	87.7	38.3	
LOS	F	E		F	E		F	D	A	F	D	
Approach Delay		92.9			84.6			43.6			41.3	
Approach LOS		F			F			D			D	
Queue Length 50th (ft)	151	153		160	113		229	550	0	72	468	
Queue Length 95th (ft)	#233	240		207	173		#432	860	0	m127	603	
Internal Link Dist (ft)		368			1162			1296			731	
Turn Bay Length (ft)				200			260		200	220		
Base Capacity (vph)	190	267		532	322		266	1899	1536	158	1677	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.68	0.69		0.50	0.34		0.74	0.64	0.16	0.42	0.61	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 102 (57%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 51.9 — Intersection LOS: D
Intersection Capacity Utilization 76.1% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: US 15/501 & Eastgate/Ephesus Church Road

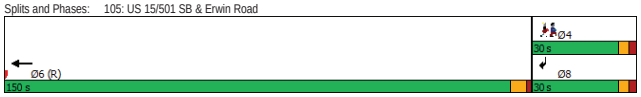


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Lane Configurations							
Traffic Volume (vph)	0	0	1483	442	0	387	
Future Volume (vph)	0	0	1483	442	0	387	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0			0	0	300	
Storage Lanes	0			1	0	1	
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.88	
Ped Bike Factor							
Frt				0.850		0.850	
Flt Protected							
Satd. Flow (prot)	0	0	5036	1568	0	2760	
Flt Permitted							
Satd. Flow (perm)	0	0	5036	1568	0	2760	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				179		122	
Link Speed (mph)		45	45		35		
Link Distance (ft)		777	779		938		
Travel Time (s)		11.8	11.8		18.3		
Confl. Peds. (#/hr)					4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	
Adj. Flow (vph)	0	0	1648	491	0	430	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	1648	491	0	430	
Turn Type			NA	Free		Prot	
Protected Phases			6			8	4
Permitted Phases				Free			
Detector Phase			6			8	
Switch Phase							
Minimum Initial (s)			12.0			7.0	7.0
Minimum Split (s)			117.0			27.4	15.0
Total Split (s)			150.0			30.0	30.0
Total Split (%)			83.3%			16.7%	17%
Maximum Green (s)			143.8			24.6	24.6
Yellow Time (s)			4.5			3.0	3.0
All-Red Time (s)			1.7			2.4	2.4
Lost Time Adjust (s)			0.0			0.0	
Total Lost Time (s)			6.2			5.4	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)			6.0			0.2	1.0
Minimum Gap (s)			2.0			2.0	2.0
Time Before Reduce (s)			15.0			0.0	0.0
Time To Reduce (s)			45.0			0.0	0.0
Recall Mode			C-Max			None	None
Walk Time (s)						7.0	
Flash Dont Walk (s)						15.0	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Pedestrian Calls (#/hr)						0	
Act Effct Green (s)			145.9	180.0		22.5	
Actuated g/C Ratio			0.81	1.00		0.12	
v/c Ratio			0.40	0.31		0.95	
Control Delay			6.6	0.4		86.8	
Queue Delay			0.2	0.0		0.0	
Total Delay			6.8	0.4		86.8	
LOS			A	A		F	
Approach Delay			5.4		86.8		
Approach LOS			A		F		
Queue Length 50th (ft)			174	0		211	
Queue Length 95th (ft)			296	0		#319	
Internal Link Dist (ft)		697	699		858		
Turn Bay Length (ft)						300	
Base Capacity (vph)			4081	1568		482	
Starvation Cap Reductn			1244	0		0	
Spillback Cap Reductn			0	0		0	
Storage Cap Reductn			0	0		0	
Reduced v/c Ratio			0.58	0.31		0.89	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 13 (7%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 19.0 Intersection LOS: B
Intersection Capacity Utilization 52.8% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 105: US 15/501 SB & Erwin Road

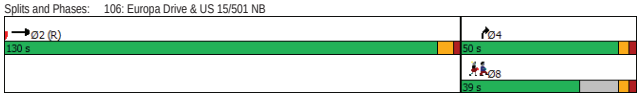


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations							
Traffic Volume (vph)	2194	81	0	0	0	249	
Future Volume (vph)	2194	81	0	0	0	249	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		250	0		0	0	
Storage Lanes		1	0		0	2	
Taper Length (ft)			25		25		
Lane Util. Factor	0.86	1.00	1.00	1.00	1.00	0.88	
Ped Bike Factor							
Frt		0.850				0.850	
Flt Protected							
Satd. Flow (prot)	6408	1583	0	0	0	2787	
Flt Permitted							
Satd. Flow (perm)	6408	1583	0	0	0	2787	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		28				14	
Link Speed (mph)	45			45	25		
Link Distance (ft)	764			605	662		
Travel Time (s)	11.6			9.2	18.1		
Confl. Peds. (#/hr)					4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	2438	90	0	0	0	277	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	2438	90	0	0	0	277	
Turn Type	NA	Free				Prot	
Protected Phases	2					4	8
Permitted Phases		Free					
Detector Phase	2					4	
Switch Phase							
Minimum Initial (s)	12.0					7.0	7.0
Minimum Split (s)	126.0					26.0	28.3
Total Split (s)	130.0					50.0	39.0
Total Split (%)	72.2%					27.8%	22%
Maximum Green (s)	123.2					44.7	33.7
Yellow Time (s)	4.5					3.0	3.0
All-Red Time (s)	2.3					2.3	2.3
Lost Time Adjust (s)	0.0					0.0	
Total Lost Time (s)	6.8					5.3	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	6.0					1.0	0.2
Minimum Gap (s)	2.0					2.0	2.0
Time Before Reduce (s)	15.0					0.0	0.0
Time To Reduce (s)	45.0					0.0	0.0
Recall Mode	C-Max					None	None
Walk Time (s)							7.0
Flash Dont Walk (s)							16.0
Pedestrian Calls (#/hr)							2
Act Effct Green (s)	147.2	180.0				20.7	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Actuated g/C Ratio	0.82	1.00				0.12	
v/c Ratio	0.47	0.06				0.83	
Control Delay	5.2	0.0				94.6	
Queue Delay	0.2	0.0				0.0	
Total Delay	5.3	0.0				94.6	
LOS	A	A				F	
Approach Delay	5.1				94.6		
Approach LOS	A				F		
Queue Length 50th (ft)	161	0				176	
Queue Length 95th (ft)	244	m0				229	
Internal Link Dist (ft)	684			525	582		
Turn Bay Length (ft)		250					
Base Capacity (vph)	5240	1583				702	
Starvation Cap Reductn	1385	0				0	
Spillback Cap Reductn	0	0				0	
Storage Cap Reductn	0	0				0	
Reduced v/c Ratio	0.63	0.06				0.39	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 65 (36%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 14.0 Intersection LOS: B
Intersection Capacity Utilization 51.0% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Europa Drive & US 15/501 NB



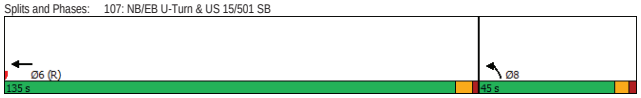
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1547	337	0
Future Volume (vph)	0	0	0	1547	337	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Right Turn on Red		Yes			Yes	Yes
Satd. Flow (RTOR)					86	
Link Speed (mph)	45			45	35	
Link Distance (ft)	779			295	205	
Travel Time (s)	11.8			4.5	4.0	
Confl. Bikes (#/hr)		3				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1719	374	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1719	374	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				12.0	7.0	
Minimum Split (s)				18.7	13.5	
Total Split (s)				135.0	45.0	
Total Split (%)				75.0%	25.0%	
Maximum Green (s)				128.3	38.5	
Yellow Time (s)				4.7	4.0	
All-Red Time (s)				2.0	2.5	
Lost Time Adjust (s)				-1.7	-1.5	
Total Lost Time (s)				5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				6.0	5.0	
Minimum Gap (s)				3.0	0.2	
Time Before Reduce (s)				15.0	0.0	
Time To Reduce (s)				45.0	0.0	
Recall Mode				C-Min	None	
Act Effct Green (s)				145.7	24.3	
Actuated g/C Ratio				0.81	0.14	
v/c Ratio				0.60	0.70	
Control Delay				12.5	66.1	
Queue Delay				0.3	0.0	
Total Delay				12.8	66.1	
LOS				B	E	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach Delay				12.8	66.1	
Approach LOS				B	E	
Queue Length 50th (ft)				625	173	
Queue Length 95th (ft)				m568	201	
Internal Link Dist (ft)	699			215	125	
Turn Bay Length (ft)						
Base Capacity (vph)				2863	829	
Starvation Cap Reductn				487	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.72	0.45	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 16 (9%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 22.3 — Intersection LOS: C
Intersection Capacity Utilization 109.4% — ICU Level of Service H
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: NB/EB U-Turn & US 15/501 SB



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2191	0	0	0	0	0	0	0	58	95	0
Future Volume (vph)	0	2191	0	0	0	0	0	0	0	58	95	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected										0.950		
Satd. Flow (prot)	0	3539	0	0	0	0	0	0	0	3433	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	3539	0	0	0	0	0	0	0	3433	1863	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										34		
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1186			764			262			186	
Travel Time (s)		18.0			11.6			6.0			3.6	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.92	0.92	0.90	0.90	0.92	0.92	0.92	0.90	0.92	0.90
Adj. Flow (vph)	0	2434	0	0	0	0	0	0	0	64	103	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2434	0	0	0	0	0	0	0	64	103	0
Turn Type		NA								Split	NA	
Protected Phases		2								4	4	
Permitted Phases												
Detector Phase		2								4	4	
Switch Phase												
Minimum Initial (s)		12.0								7.0	7.0	
Minimum Split (s)		150.0								30.0	30.0	
Total Split (s)		150.0								30.0	30.0	
Total Split (%)		83.3%								16.7%	16.7%	
Maximum Green (s)		143.8								24.0	24.0	
Yellow Time (s)		4.7								4.0	4.0	
All-Red Time (s)		1.5								2.0	2.0	
Lost Time Adjust (s)		-1.2								-1.0	0.0	
Total Lost Time (s)		5.0								5.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0								1.0	1.0	
Minimum Gap (s)		2.0								2.0	2.0	
Time Before Reduce (s)		15.0								0.0	0.0	
Time To Reduce (s)		45.0								0.0	0.0	
Recall Mode		C-Max								None	None	
Act Effct Green (s)		155.6								14.4	13.4	
Actuated g/C Ratio		0.86								0.08	0.07	
v/c Ratio		0.80								0.21	0.75	
Control Delay		8.8								37.2	107.8	
Queue Delay		0.0								0.0	0.0	
Total Delay		8.8								37.2	107.8	
LOS		A								D	F	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		8.8									80.7	
Approach LOS		A									F	
Queue Length 50th (ft)		238								17	123	
Queue Length 95th (ft)		290								m39	m184	
Internal Link Dist (ft)		1106			684			182			106	
Turn Bay Length (ft)												
Base Capacity (vph)		3059								506	248	
Starvation Cap Reductn		0								0	0	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.80								0.13	0.42	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 70 (39%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 13.5 — Intersection LOS: B
Intersection Capacity Utilization 75.6% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 108: US 15/501 NB & SB/WB U-Turn



UNC DP TIA 2023 — Existing (2023) PM
109: Old Durham-CH Road/Sage Road & US 15/501 — Lanes, Volumes, Timings

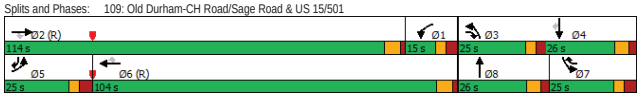
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	362	1462	233	83	1232	240	199	176	28	185	168	114
Future Volume (vph)	362	1462	233	83	1232	240	199	176	28	185	168	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	240		100	220		200	100		0	150		100
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.98				0.99	1.00				0.98
Frt			0.850			0.850		0.980				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3505	1568	1752	3505	1568	1752	1804	0	3400	1845	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	3505	1536	1752	3505	1568	1737	1804	0	3400	1845	1539
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			96			59		4				90
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		829			1831			1573			1089	
Travel Time (s)		12.6			27.7			30.6			21.2	
Confl. Peds. (#/hr)							4					4
Confl. Bikes (#/hr)			1						1			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	402	1624	259	92	1369	267	221	196	31	206	187	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	402	1624	259	92	1369	267	221	227	0	206	187	127
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	25.0	89.0	25.0	20.0	65.0	25.0	25.0	25.0		25.0	25.0	25.0
Total Split (s)	25.0	114.0	25.0	15.0	104.0	25.0	25.0	26.0		25.0	26.0	25.0
Total Split (%)	13.9%	63.3%	13.9%	8.3%	57.8%	13.9%	13.9%	14.4%		13.9%	14.4%	13.9%
Maximum Green (s)	18.1	108.3	19.1	8.7	97.9	18.3	19.1	19.4		18.3	19.6	18.1
Yellow Time (s)	3.0	4.4	3.0	3.0	4.5	3.0	3.0	4.1		3.0	4.1	3.0
All-Red Time (s)	3.9	1.3	2.9	3.3	1.6	3.7	2.9	2.5		3.7	2.3	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.9	5.7	5.9	6.3	6.1	6.7	5.9	6.6		6.7	6.4	6.9
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	4.0	1.0	6.0	1.0	4.0	4.0		1.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	15.0	0.0	0.0	15.0	0.0	0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	45.0	0.0	0.0	45.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	18.5	108.7	127.6	8.7	97.9	115.2	19.1	19.4		17.9	19.2	37.2

UNC DP TIA 2023 — Existing (2023) PM
109: Old Durham-CH Road/Sage Road & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.10	0.60	0.71	0.05	0.54	0.64	0.11	0.11		0.10	0.11	0.21
v/c Ratio	1.15	0.77	0.23	1.10	0.72	0.26	1.19	1.15		0.61	0.95	0.32
Control Delay	157.5	31.4	4.1	178.1	24.0	4.8	191.8	174.2		85.9	131.2	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	157.5	31.4	4.1	178.1	24.0	4.8	191.8	174.2		85.9	131.2	20.4
LOS	F	C	A	F	C	A	F	F		F	F	C
Approach Delay		50.5			29.3			182.9			86.2	
Approach LOS		D			C			F			F	
Queue Length 50th (ft)	~294	768	50	~121	324	43	~313	~309		122	223	34
Queue Length 95th (ft)	#409	776	65	m#252	616	143	#499	#500		170	#388	97
Internal Link Dist (ft)		749			1751			1493			1009	
Turn Bay Length (ft)	240		100	220		200	100			150		100
Base Capacity (vph)	349	2116	1119	84	1906	1028	185	198		345	200	392
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.15	0.77	0.23	1.10	0.72	0.26	1.19	1.15		0.60	0.94	0.32

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 32 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 160
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.19
Intersection Signal Delay: 58.8 — Intersection LOS: E
Intersection Capacity Utilization 86.4% — ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 109: Old Durham-CH Road/Sage Road & US 15/501



UNC DP TIA 2023 — Existing (2023) PM
110: BCBS/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

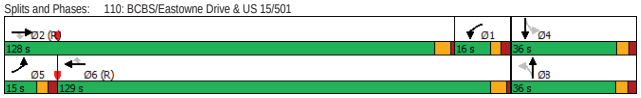
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	1664	15	90	1469	48	6	27	82	121	26	93
Future Volume (vph)	31	1664	15	90	1469	48	6	27	82	121	26	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220		100	220		250	100		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98			0.98						
Frt			0.850			0.850		0.887			0.883	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1636	0	1752	1629	0
Flt Permitted	0.950			0.950			0.511			0.550		
Satd. Flow (perm)	1752	3505	1536	1752	3505	1536	943	1636	0	1015	1629	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			54		73			85	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		1831			1555			278			606	
Travel Time (s)		27.7			23.6			7.6			16.5	
Confl. Bikes (#/hr)			1			1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	34	1849	17	100	1632	53	7	30	91	134	29	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	1849	17	100	1632	53	7	121	0	134	132	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	19.0	127.0	127.0	17.0	108.0	108.0	36.0	36.0		36.0	36.0	
Total Split (s)	15.0	128.0	128.0	16.0	129.0	129.0	36.0	36.0		36.0	36.0	
Total Split (%)	8.3%	71.1%	71.1%	8.9%	71.7%	71.7%	20.0%	20.0%		20.0%	20.0%	
Maximum Green (s)	9.2	122.3	122.3	10.2	123.1	123.1	29.9	29.9		30.1	30.1	
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.3	3.3		3.6	3.6	
All-Red Time (s)	2.8	1.1	1.1	2.8	1.3	1.3	2.8	2.8		2.3	2.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.8	5.7	5.7	5.8	5.9	5.9	6.1	6.1		5.9	5.9	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	6.0	1.0	6.0	6.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	50.0	50.0	0.0	50.0	50.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										23.0	23.0	

UNC DP TIA 2023 — Existing (2023) PM
110: BCBS/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)										2	2	
Act Effct Green (s)	7.7	126.1	126.1	10.2	130.9	130.9	26.1	26.1		26.3	26.3	
Actuated g/C Ratio	0.04	0.70	0.70	0.06	0.73	0.73	0.14	0.14		0.15	0.15	
v/c Ratio	0.45	0.75	0.02	1.01	0.64	0.05	0.05	0.40		0.91	0.43	
Control Delay	120.6	5.8	0.1	142.7	8.3	2.3	64.7	32.1		126.9	29.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	120.6	5.8	0.1	142.7	8.3	2.3	64.7	32.1		126.9	29.8	
LOS	F	A	A	F	A	A	E	C		F	C	
Approach Delay		7.8			15.7			33.9			78.7	
Approach LOS		A			B			C			E	
Queue Length 50th (ft)	43	106	0	~121	147	0	7	50		156	49	
Queue Length 95th (ft)	m56	m161	m0	m#209	281	m10	24	119		#274	121	
Internal Link Dist (ft)		1751			1475			198			526	
Turn Bay Length (ft)	220		100	220		250	100					
Base Capacity (vph)	89	2455	1092	99	2549	1132	156	332		169	343	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.38	0.75	0.02	1.01	0.64	0.05	0.04	0.36		0.79	0.38	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 16 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.01
Intersection Signal Delay: 16.7 — Intersection LOS: B
Intersection Capacity Utilization 79.7% — ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 110: BCBS/Eastowne Drive & US 15/501



UNC DP TIA 2023 — Existing (2023) PM
111: Lakeview Drive/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1863	9	80	1572	115	11	23	98	226	16	10
Future Volume (vph)	1	1863	9	80	1572	115	11	23	98	226	16	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		125	0		0	150		0	200		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00							1.00	
Frt		0.999				0.850		0.879			0.943	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	5030	0	1752	3505	1568	1752	1621	0	1752	1731	0
Flt Permitted	0.950			0.950			0.738			0.597		
Satd. Flow (perm)	1752	5030	0	1751	3505	1568	1361	1621	0	1101	1731	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				65		106			11	
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		1555			959			495			676	
Travel Time (s)		23.6			14.5			9.6			18.4	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	1	2070	10	89	1747	128	12	26	109	251	18	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	2080	0	89	1747	128	12	135	0	251	29	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	92.0		30.0	80.0	80.0	30.0	30.0		30.0	30.0	
Total Split (s)	15.0	100.0		15.0	100.0	100.0	65.0	65.0		65.0	65.0	
Total Split (%)	8.3%	55.6%		8.3%	55.6%	55.6%	36.1%	36.1%		36.1%	36.1%	
Maximum Green (s)	9.4	94.5		9.2	94.5	94.5	58.8	58.8		58.9	58.9	
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	3.2	3.2		3.1	3.1	
All-Red Time (s)	2.6	1.0		2.8	1.0	1.0	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.5		5.8	5.5	5.5	6.2	6.2		6.1	6.1	
Lead/Lag	Lead	Lead		Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0		1.0	6.0	6.0	1.0	1.0		2.0	2.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	45.0		0.0	45.0	45.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	7.0	109.5		9.2	122.0	122.0	43.8	43.8		43.9	43.9	

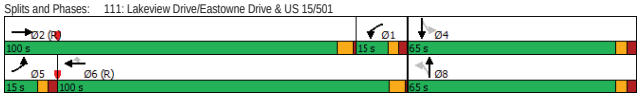
UNC DP TIA 2023 — Existing (2023) PM
111: Lakeview Drive/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.04	0.61		0.05	0.68	0.68	0.24	0.24		0.24	0.24	
v/c Ratio	0.01	0.68		1.00	0.74	0.12	0.04	0.28		0.94	0.07	
Control Delay	118.0	16.0		176.0	23.5	7.1	46.9	14.3		106.4	33.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	118.0	16.0		176.0	23.5	7.1	46.9	14.3		106.4	33.0	
LOS	F	B		F	C	A	D	B		F	C	
Approach Delay		16.0			29.4			17.0			98.8	
Approach LOS		B			C			B			F	
Queue Length 50th (ft)	1	327		107	634	23	11	27		293	16	
Queue Length 95th (ft)	m1	455		#238	1080	71	28	80		384	43	
Internal Link Dist (ft)		1475			879			415			596	
Turn Bay Length (ft)	150						150			200		
Base Capacity (vph)	91	3060		89	2375	1083	444	600		360	573	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.01	0.68		1.00	0.74	0.12	0.03	0.23		0.70	0.05	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 45 (25%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 27.1 — Intersection LOS: C
Intersection Capacity Utilization 88.6% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 111: Lakeview Drive/Eastowne Drive & US 15/501



UNC DP TIA 2023 — Existing (2023) PM
201: Hamilton Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	2000	46	56	1610	37	143	14	85	117	14	29
Future Volume (vph)	24	2000	46	56	1610	37	143	14	85	117	14	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-4%			2%			-2%	
Storage Length (ft)	200		0	200		0	0		150	100		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.99		0.96	0.98	0.99	
Frt		0.997			0.997				0.850		0.900	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	5016	0	1805	5167	0	1752	1844	1567	1787	1669	0
Flt Permitted	0.092			0.042			0.726			0.747		
Satd. Flow (perm)	170	5016	0	80	5167	0	1327	1844	1510	1371	1669	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		4			4							
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		895			935			499			486	
Travel Time (s)		13.6			14.2			9.7			9.5	
Confl. Peds. (#/hr)	4		2	2		4	7		19	19		7
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	27	2222	51	62	1789	41	159	16	94	130	16	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	2273	0	62	1830	0	159	16	94	130	48	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	6			2			8		8	4		
Detector Phase	5	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	12.6	28.7		12.4	25.9		41.0	41.0	12.4	39.6	39.6	
Total Split (s)	20.0	89.0		20.0	89.0		41.0	41.0	20.0	41.0	41.0	
Total Split (%)	13.3%	59.3%		13.3%	59.3%		27.3%	27.3%	13.3%	27.3%	27.3%	
Maximum Green (s)	14.4	83.3		14.6	83.3		34.7	34.7	14.6	34.4	34.4	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.7	3.7	3.0	3.2	3.2	
All-Red Time (s)	2.6	1.7		2.4	1.7		2.6	2.6	2.4	3.4	3.4	
Lost Time Adjust (s)	-0.6	-0.6		-0.4	-0.9		-1.4	-1.4	-0.4	-1.5	-1.5	
Total Lost Time (s)	5.0	5.1		5.0	4.8		4.9	4.9	5.0	5.1	5.1	
Lead/Lag	Lead	Lead		Lag	Lag				Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		2.0	3.0		1.0	1.0	2.0	1.0	1.0	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		16.0			13.0		27.0	27.0		26.0	26.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	114.2	100.7		112.2	109.8		22.9	22.9	34.2	22.7	22.7	
Actuated g/C Ratio	0.76	0.67		0.75	0.73		0.15	0.15	0.23	0.15	0.15	

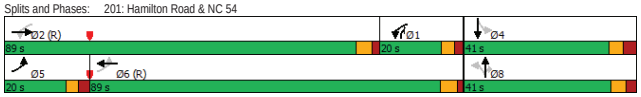
UNC DP TIA 2023 — Existing (2023) PM
201: Hamilton Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.13	0.67		0.33	0.48		0.79	0.06	0.27	0.63	0.19	
Control Delay	6.2	17.4		26.4	6.5		85.9	50.9	43.1	71.9	54.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	6.2	17.4		26.4	6.5		85.9	50.9	43.1	71.9	54.6	
LOS	A	B		C	A		F	D	D	E	D	
Approach Delay		17.3			7.1			68.9			67.2	
Approach LOS		B			A			E			E	
Queue Length 50th (ft)	5	457		12	194		152	14	73	121	42	
Queue Length 95th (ft)	16	647		56	139		223	34	110	183	78	
Internal Link Dist (ft)		815			855			419			406	
Turn Bay Length (ft)	200			200					150	100		
Base Capacity (vph)	290	3368		234	3783		319	443	380	328	399	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.09	0.67		0.26	0.48		0.50	0.04	0.25	0.40	0.12	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 142 (95%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 18.1 — Intersection LOS: B
Intersection Capacity Utilization 75.7% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 201: Hamilton Road & NC 54



UNC DP TIA 2023 — Existing (2023) PM
202: Finley Golf Course Road/Burning Tree Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	2348	20	184	1556	24	38	11	137	33	14	34
Future Volume (vph)	52	2348	20	184	1556	24	38	11	137	33	14	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	12	12	12	10	10	10
Storage Length (ft)	200		0	100		0	460		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.999			0.998				0.850		0.944	
Flt Protected	0.950			0.950				0.963			0.980	
Satd. Flow (prot)	1770	5078	0	1770	4904	0	0	1794	1583	0	1595	0
Flt Permitted	0.108			0.038				0.617			0.843	
Satd. Flow (perm)	201	5078	0	71	4904	0	0	1143	1583	0	1372	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			2				66		24	
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		651			853			632			471	
Travel Time (s)		9.9			12.9			12.3			9.2	
Confl. Peds. (#/hr)	2		7	7		2	7					7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	58	2609	22	204	1729	27	42	12	152	37	16	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	2631	0	204	1756	0	0	54	152	0	91	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	6			2			8		8	4		
Detector Phase	5	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	12.9	31.2		12.9	29.2		47.2	47.2	12.9	45.3	45.3	
Total Split (s)	20.0	82.0		20.0	82.0		48.0	48.0	20.0	48.0	48.0	
Total Split (%)	13.3%	54.7%		13.3%	54.7%		32.0%	32.0%	13.3%	32.0%	32.0%	
Maximum Green (s)	14.1	75.8		14.1	75.8		41.8	41.8	14.1	41.7	41.7	
Yellow Time (s)	3.0	4.9		3.0	4.9		3.7	3.7	3.0	3.2	3.2	
All-Red Time (s)	2.9	1.3		2.9	1.3		2.5	2.5	2.9	3.1	3.1	
Lost Time Adjust (s)	-0.9	-1.2		-0.9	-1.2			-1.2	-0.9		-1.3	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lead		Lag	Lag				Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0	2.0	2.0	2.0	
Minimum Gap (s)	0.2	3.0		0.2	3.0		0.2	0.2	0.2	0.2	0.2	
Time Before Reduce (s)	0.0	20.0		0.0	20.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	40.0		0.0	40.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		7.0			7.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		18.0			16.0		34.0	34.0		32.0	32.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	

Existing (2023) PM.syn — VHB

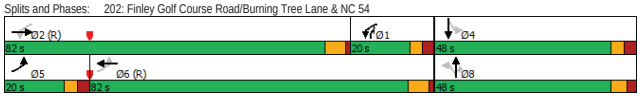
UNC DP TIA 2023 — Existing (2023) PM
202: Finley Golf Course Road/Burning Tree Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	122.7	107.1		121.7	116.2			13.3	32.9		13.3	
Actuated g/C Ratio	0.82	0.71		0.81	0.77			0.09	0.22		0.09	
v/c Ratio	0.23	0.73		0.91	0.46			0.53	0.38		0.64	
Control Delay	3.2	8.0		91.5	7.2			83.3	29.5		67.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	3.2	8.0		91.5	7.2			83.3	29.5		67.3	
LOS	A	A		F	A			F	C		E	
Approach Delay		7.8			15.9			43.6			67.3	
Approach LOS		A			B			D			E	
Queue Length 50th (ft)	2	145		147	207			52	70		64	
Queue Length 95th (ft)	7	229		#306	290			97	132		122	
Internal Link Dist (ft)		571			773			552			391	
Turn Bay Length (ft)	200			100								
Base Capacity (vph)	326	3624		227	3799			327	392		410	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.18	0.73		0.90	0.46			0.17	0.39		0.22	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 145 (97%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 13.6 — Intersection LOS: B
Intersection Capacity Utilization 84.1% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 202: Finley Golf Course Road/Burning Tree Lane & NC 54



Existing (2023) PM.syn — VHB

UNC DP TIA 2023 — Existing (2023) PM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	2055	14	7	1879	12	42	11	42	28	1	133
Future Volume (vph)	156	2055	14	7	1879	12	42	11	42	28	1	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	250		250	0		125	0		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.87			0.95						
Frt			0.850			0.850		0.881			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1641	0	1770	1585	0
Flt Permitted	0.058			0.057			0.289			0.700		
Satd. Flow (perm)	108	5085	1382	106	5085	1511	538	1641	0	1304	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			65			129		47			148	
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		853			1936			433			831	
Travel Time (s)		12.9			29.3			11.8			16.2	
Confl. Peds. (#/hr)	25		26	26		25						
Confl. Bikes (#/hr)						3						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	173	2283	16	8	2088	13	47	12	47	31	1	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	173	2283	16	8	2088	13	47	59	0	31	149	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6		2	2		6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.3	27.3	27.3	13.3	18.3	18.3	13.8	13.8		14.3	14.3	
Total Split (s)	24.0	100.0	100.0	20.0	96.0	96.0	30.0	30.0		30.0	30.0	
Total Split (%)	13.6%	56.5%	56.5%	11.3%	54.2%	54.2%	16.9%	16.9%		16.9%	16.9%	
Maximum Green (s)	17.7	93.7	93.7	13.7	89.7	89.7	23.2	23.2		22.7	22.7	
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.0	3.0		3.5	3.5	
All-Red Time (s)	3.3	1.6	1.6	3.3	1.6	1.6	3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.8	-1.8		-2.3	-2.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag					Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	6.0	1.0	6.0	6.0	2.0	2.0		2.0	2.0	
Minimum Gap (s)	0.2	3.0	3.0	0.2	3.0	3.0	0.2	0.2		0.2	0.2	
Time Before Reduce (s)	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	40.0	40.0	0.0	40.0	40.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		14.0	14.0									
Pedestrian Calls (#/hr)		0	0									

Existing (2023) PM.syn — VHB

UNC DP TIA 2023 — Existing (2023) PM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	27.0
Total Split (s)	27.0
Total Split (%)	15%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0

Existing (2023) PM.syn — VHB

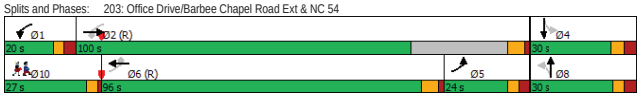
UNC DP TIA 2023 — Existing (2023) PM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	145.2	144.9	144.9	148.2	122.4	122.4	16.8	16.8		16.8	16.8	
Actuated g/C Ratio	0.82	0.82	0.82	0.84	0.69	0.69	0.09	0.09		0.09	0.09	
v/c Ratio	0.57	0.55	0.01	0.05	0.59	0.01	0.94	0.30		0.25	0.53	
Control Delay	49.3	7.1	0.0	3.6	15.6	0.0	185.2	26.9		76.6	16.4	
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	49.3	7.6	0.0	3.6	15.6	0.0	185.2	26.9		76.6	16.4	
LOS	D	A	A	A	B	A	F	C		E	B	
Approach Delay		10.5			15.5			97.1			26.8	
Approach LOS		B			B			F			C	
Queue Length 50th (ft)	97	216	0	1	406	0	55	13		34	1	
Queue Length 95th (ft)	196	479	0	5	516	0	#120	60		69	73	
Internal Link Dist (ft)		773			1856			353			751	
Turn Bay Length (ft)	250		250	250		250						
Base Capacity (vph)	303	4163	1143	231	3516	1084	75	272		184	350	
Starvation Cap Reductn	0	1225	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.57	0.78	0.01	0.03	0.59	0.01	0.63	0.22		0.17	0.43	

Intersection Summary

Area Type: Other
Cycle Length: 177
Actuated Cycle Length: 177
Offset: 139 (79%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 15.1 — Intersection LOS: B
Intersection Capacity Utilization 76.3% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 203: Office Drive/Barbee Chapel Road Ext & NC 54



UNC DP TIA 2023 — Existing (2023) PM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	Ø10
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — Existing (2023) PM
204: Friday Center Lane/Meadowmont Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	2040	37	31	1496	94	94	16	328	115	25	149
Future Volume (vph)	98	2040	37	31	1496	94	94	16	328	115	25	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	12	12	12	12	12	12	12	12	12
Storage Length (ft)	250		250	250		250	0		400	225		0
Storage Lanes	2		1	2		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	1.00	0.97	1.00	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	0.99	0.99	0.99	1.00		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.966		0.950		
Satd. Flow (prot)	3433	5085	1478	3433	5085	1583	1681	1709	1583	3433	1863	1583
Flt Permitted	0.950			0.950			0.950	0.966		0.950		
Satd. Flow (perm)	3430	5085	1444	3430	5085	1556	1668	1700	1562	3425	1863	1555
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			84			101			79			154
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1936			1043			1237			723	
Travel Time (s)		29.3			15.8			24.1			14.1	
Confl. Peds. (#/hr)	4		7	7		4	5		1	1		5
Confl. Bikes (#/hr)									1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	109	2267	41	34	1662	104	104	18	364	128	28	166
Shared Lane Traffic (%)							42%					
Lane Group Flow (vph)	109	2267	41	34	1662	104	60	62	364	128	28	166
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2	4	1	6	3	4	4	1	3	3	5
Permitted Phases			2			6			4			3
Detector Phase	5	2	4	1	6	3	4	4	1	3	3	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.2	34.6	14.1	14.1	38.5	14.3	14.1	14.1	14.1	14.3	14.3	14.2
Total Split (s)	25.0	68.0	32.0	28.0	71.0	22.0	32.0	32.0	28.0	22.0	22.0	25.0
Total Split (%)	16.7%	45.3%	21.3%	18.7%	47.3%	14.7%	21.3%	21.3%	18.7%	14.7%	14.7%	16.7%
Maximum Green (s)	17.8	61.4	24.9	20.9	64.5	14.7	24.9	24.9	20.9	14.7	14.7	17.8
Yellow Time (s)	3.2	4.6	3.7	3.1	4.4	4.0	3.7	3.7	3.1	4.0	4.0	3.2
All-Red Time (s)	4.0	2.0	3.4	4.0	2.1	3.3	3.4	3.4	4.0	3.3	3.3	4.0
Lost Time Adjust (s)	-2.2	-1.6	-2.1	-2.1	-1.5	-2.3	-2.1	-2.1	-2.1	-2.3	-2.3	-2.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Time Before Reduce (s)	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	C-Min	None	None	C-Min	Min	None	None	None	Min	Min	Min
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		21.0			25.0							

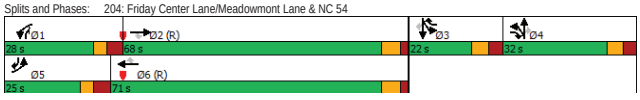
UNC DP TIA 2023 — Existing (2023) PM
204: Friday Center Lane/Meadowmont Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	10.7	84.9	96.3	22.1	96.3	107.8	11.5	11.5	33.6	11.5	11.5	22.3
Actuated g/C Ratio	0.07	0.57	0.64	0.15	0.64	0.72	0.08	0.08	0.22	0.08	0.08	0.15
v/c Ratio	0.44	0.79	0.04	0.07	0.51	0.09	0.47	0.48	0.88	0.48	0.20	0.46
Control Delay	72.3	29.6	0.1	61.7	8.0	0.2	77.7	77.9	63.7	72.3	67.2	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.3	29.6	0.1	61.7	8.0	0.2	77.7	77.9	63.7	72.3	67.2	10.8
LOS	E	C	A	E	A	A	E	E	E	E	E	B
Approach Delay		31.1			8.5			67.2			40.2	
Approach LOS		C			A			E			D	
Queue Length 50th (ft)	53	612	0	17	115	0	61	62	267	63	26	9
Queue Length 95th (ft)	85	#852	0	m27	180	m1	110	113	351	96	60	60
Internal Link Dist (ft)		1856			963			1157			643	
Turn Bay Length (ft)	250		250	250		250			400	225		
Base Capacity (vph)	457	2876	1104	572	3263	1202	302	307	443	389	211	452
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.79	0.04	0.06	0.51	0.09	0.20	0.20	0.82	0.33	0.13	0.37

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 70 (47%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 27.1 — Intersection LOS: C
Intersection Capacity Utilization 78.2% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 204: Friday Center Lane/Meadowmont Lane & NC 54



UNC DP TIA 2023 — Existing (2023) PM
205: Barbee Chapel Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1787	635	123	1514	155	286	77	55	101	87	24
Future Volume (vph)	10	1787	635	123	1514	155	286	77	55	101	87	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		275	325		80	250		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Ped Bike Factor			0.96			0.98	1.00	1.00			1.00	
Frt			0.850			0.850		0.960			0.970	
Flt Protected	0.950			0.950			0.950	0.982		0.950	0.996	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1681	1668	0	1681	1705	0
Flt Permitted	0.084			0.058			0.950	0.982		0.950	0.996	
Satd. Flow (perm)	156	5085	1525	108	5085	1546	1679	1668	0	1681	1705	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			285			80		11			7	
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		1043			982			1263			745	
Travel Time (s)		15.8			14.9			19.1			14.5	
Confl. Peds. (#/hr)	1		4	4		1	1					1
Confl. Bikes (#/hr)			3									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	1986	706	137	1682	172	318	86	61	112	97	27
Shared Lane Traffic (%)							26%			10%		
Lane Group Flow (vph)	11	1986	706	137	1682	172	235	230	0	101	135	0
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	Split	NA		Split	NA	
Protected Phases	5	2	4	1	6	3	4	4		3	3	
Permitted Phases	6		2	2		6						
Detector Phase	5	2	4	1	6	3	4	4		3	3	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.8	26.5	14.2	14.0	28.5	14.2	14.2	14.2		14.2	14.2	
Total Split (s)	20.0	74.0	36.0	20.0	74.0	20.0	36.0	36.0		20.0	20.0	
Total Split (%)	13.3%	49.3%	24.0%	13.3%	49.3%	13.3%	24.0%	24.0%		13.3%	13.3%	
Maximum Green (s)	13.2	66.5	28.8	13.0	66.5	12.8	28.8	28.8		12.8	12.8	
Yellow Time (s)	3.0	4.8	4.3	3.0	4.8	3.9	4.3	4.3		3.9	3.9	
All-Red Time (s)	3.8	2.7	2.9	4.0	2.7	3.3	2.9	2.9		3.3	3.3	
Lost Time Adjust (s)	-1.8	-2.5	-2.2	-2.0	-2.5	-2.2	-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0	3.0	2.0	6.0	2.0	3.0	3.0		2.0	2.0	
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2		0.2	0.2	
Time Before Reduce (s)	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min	None	None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		12.0			14.0							
Pedestrian Calls (#/hr)		0			0							

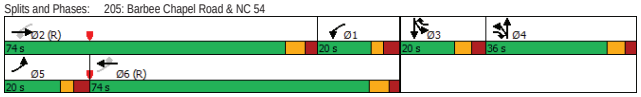
UNC DP TIA 2023 — Existing (2023) PM
205: Barbee Chapel Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	89.7	73.1	101.6	86.7	86.2	101.0	28.4	28.4		14.9	14.9	
Actuated g/C Ratio	0.60	0.49	0.68	0.58	0.57	0.67	0.19	0.19		0.10	0.10	
v/c Ratio	0.06	0.80	0.62	0.65	0.58	0.16	0.74	0.71		0.61	0.77	
Control Delay	6.6	23.0	6.8	62.5	22.7	5.3	71.4	66.3		80.6	89.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.6	23.0	6.8	62.5	22.7	5.3	71.4	66.3		80.6	89.7	
LOS	A	C	A	E	C	A	E	E		F	F	
Approach Delay		18.7			24.0			68.9			85.8	
Approach LOS		B			C			E			F	
Queue Length 50th (ft)	2	361	65	78	360	24	225	209		100	129	
Queue Length 95th (ft)	m2	363	237	153	493	65	330	311		171	#245	
Internal Link Dist (ft)		963			902			1183			665	
Turn Bay Length (ft)	275		275	325		80	250					
Base Capacity (vph)	256	2479	1150	229	2921	1076	347	353		173	181	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.04	0.80	0.61	0.60	0.58	0.16	0.68	0.65		0.58	0.75	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 76 (51%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 27.9 — Intersection LOS: C
Intersection Capacity Utilization 75.5% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 205: Barbee Chapel Road & NC 54



UNC DP TIA 2023 — Existing (2023) PM
208: Environ Way/Rogerson Dr & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2183	48	63	1704	0	0	0	84	0	0	2
Future Volume (vph)	0	2183	48	63	1704	0	0	0	84	0	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-4%			0%			0%	
Storage Length (ft)	0		100	250		0	0		0	0		0
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.98
Frt			0.850						0.865			0.865
Flt Protected				0.950								
Satd. Flow (prot)	0	5085	1583	1805	5187	0	0	0	1611	0	0	1611
Flt Permitted				0.050								
Satd. Flow (perm)	0	5085	1583	95	5187	0	0	0	1611	0	0	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			67						350			67
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		935			651			374			582	
Travel Time (s)		14.2			9.9			8.5			13.2	
Confl. Peds. (#/hr)	1		14	14		1	2		2	2		2
Confl. Bikes (#/hr)						2						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2426	53	70	1893	0	0	0	93	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2426	53	70	1893	0	0	0	93	0	0	2
Turn Type		NA	Prot	D.P+P	NA				custom			Perm
Protected Phases		2	2	1	6							
Permitted Phases				2								4
Detector Phase		2	2	1	6							4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0							7.0
Minimum Split (s)		30.6	30.6	31.6	16.6							22.6
Total Split (s)		96.0	96.0	25.0	121.0							29.0
Total Split (%)		64.0%	64.0%	16.7%	80.7%							19.3%
Maximum Green (s)		89.4	89.4	19.4	114.4							22.4
Yellow Time (s)		4.0	4.0	3.0	4.0							4.0
All-Red Time (s)		2.6	2.6	2.6	2.6							2.6
Lost Time Adjust (s)		-1.6	-1.6	-0.6	-1.6							-1.6
Total Lost Time (s)		5.0	5.0	5.0	5.0							5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		2.0	2.0	2.0	2.0							2.0
Recall Mode		C-Max	C-Max	None	C-Min							None
Walk Time (s)		7.0	7.0	7.0								7.0
Flash Dont Walk (s)		17.0	17.0	19.0								9.0
Pedestrian Calls (#/hr)		0	0	0								0
Act Effct Green (s)		132.4	132.4	138.3	146.3				0.0			8.6
Actuated g/C Ratio		0.88	0.88	0.92	0.98				0.00			0.06

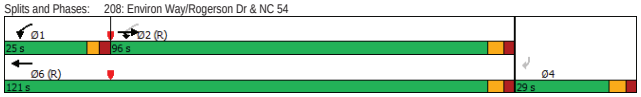
UNC DP TIA 2023 — Existing (2023) PM
208: Environ Way/Rogerson Dr & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.54	0.04	0.38	0.37				0.27			0.01
Control Delay		1.3	0.0	25.3	0.4				1.8			0.0
Queue Delay		0.1	0.0	0.0	0.0				0.0			0.0
Total Delay		1.3	0.0	25.3	0.4				1.8			0.0
LOS		A	A	C	A				A			A
Approach Delay		1.3			1.3			1.8				
Approach LOS		A			A			A				
Queue Length 50th (ft)		48	0	8	0				0			0
Queue Length 95th (ft)		67	m0	56	44				0			0
Internal Link Dist (ft)		855			571			294			502	
Turn Bay Length (ft)			100	250								
Base Capacity (vph)		4487	1405	317	5058				350			309
Starvation Cap Reductn		510	0	0	72				0			0
Spillback Cap Reductn		0	0	0	0				0			0
Storage Cap Reductn		0	0	0	0				0			0
Reduced v/c Ratio		0.61	0.04	0.22	0.38				0.27			0.01

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 135 (90%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 1.3 — Intersection LOS: A
Intersection Capacity Utilization 56.4% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 208: Environ Way/Rogerson Dr & NC 54



UNC DP TIA 2023 — Existing (2023) PM
301: Columbia Street & Culbreth Road/Mt Carmel Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	82	49	22	82	385	40	760	5	454	1259	165
Future Volume (vph)	102	82	49	22	82	385	40	760	5	454	1259	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	200		115	380		415	100		95	491		207
Storage Lanes	1		1	0		2	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950				0.990		0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	0	1918	2898	1787	3575	1599	1752	3504	1567
Flt Permitted	0.950				0.218		0.192			0.205		
Satd. Flow (perm)	1743	1835	1560	0	422	2898	361	3575	1599	378	3504	1567
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			118			428			120			183
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		950			859			2346			550	
Travel Time (s)		18.5			16.7			45.7			10.7	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)												3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	113	91	54	24	91	428	44	844	6	504	1399	183
Shared Lane Traffic (%)												
Lane Group Flow (vph)	113	91	54	0	115	428	44	844	6	504	1399	183
Turn Type	custom	NA	Perm	Perm	NA	Prot	Perm	NA	Perm	pm+pt	NA	Prot
Protected Phases	4	4			3	3		2		1	6	6
Permitted Phases	4		4	3			2		2	6		
Detector Phase	4	4	4	3	3	3	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	12.0	7.0	12.0	12.0
Minimum Split (s)	13.4	13.4	13.4	13.9	13.9	13.9	18.2	18.2	18.2	12.1	25.2	25.2
Total Split (s)	19.0	19.0	19.0	18.0	18.0	18.0	55.0	55.0	55.0	48.0	103.0	103.0
Total Split (%)	13.6%	13.6%	13.6%	12.9%	12.9%	12.9%	39.3%	39.3%	39.3%	34.3%	73.6%	73.6%
Maximum Green (s)	12.6	12.6	12.6	11.1	11.1	11.1	48.8	48.8	48.8	42.9	97.5	97.5
Yellow Time (s)	4.2	4.2	4.2	4.5	4.5	4.5	4.7	4.7	4.7	3.0	4.3	4.3
All-Red Time (s)	2.2	2.2	2.2	2.4	2.4	2.4	1.5	1.5	1.5	2.1	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4		6.9	6.9	6.2	6.2	6.2	5.1	5.5	5.5
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	6.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	15.0	0.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0	45.0	0.0	45.0	45.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)											7.0	7.0
Flash Dont Walk (s)											12.0	12.0

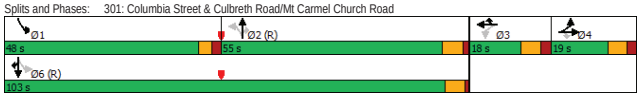
Existing (2023) PM.syn — VHB

UNC DP TIA 2023 — Existing (2023) PM
301: Columbia Street & Culbreth Road/Mt Carmel Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)											0	0
Act Effct Green (s)	11.8	11.8	11.8		11.1	11.1	59.7	59.7	59.7	98.7	98.3	98.3
Actuated g/C Ratio	0.08	0.08	0.08		0.08	0.08	0.43	0.43	0.43	0.70	0.70	0.70
v/c Ratio	0.77	0.59	0.23		3.48	0.69	0.29	0.55	0.01	0.86	0.57	0.16
Control Delay	94.8	77.5	2.2		1207.6	11.6	54.6	45.0	0.0	33.2	5.3	0.3
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Total Delay	94.8	77.5	2.2		1207.6	11.6	54.6	45.0	0.0	33.2	5.5	0.3
LOS	F	E	A		F	B	D	D	A	C	A	A
Approach Delay		69.3			264.9			45.2			11.7	
Approach LOS		E			F			D			B	
Queue Length 50th (ft)	102	81	0		~186	0	26	306	0	188	126	0
Queue Length 95th (ft)	#196	142	0		#316	56	85	494	m0	325	121	0
Internal Link Dist (ft)		870			779			2266			470	
Turn Bay Length (ft)	200		115			415	100		95	491		207
Base Capacity (vph)	156	165	247		33	623	153	1523	750	687	2460	1154
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	299	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.55	0.22		3.48	0.69	0.29	0.55	0.01	0.73	0.65	0.16

Intersection Summary
Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 138 (99%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 3.48
Intersection Signal Delay: 59.9 — Intersection LOS: E
Intersection Capacity Utilization 73.5% — ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 301: Columbia Street & Culbreth Road/Mt Carmel Church Road



Existing (2023) PM.syn — VHB

UNC DP TIA 2023 — Existing (2023) PM
302: Columbia Street & Arlen Park Drive/Bennett Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	13	3	78	15	4	12	658	99	49	1173	100
Future Volume (vph)	70	13	3	78	15	4	12	658	99	49	1173	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	350		350	350		350
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00							0.98			
Frt		0.974			0.971				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1810	0	1770	1809	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.744			0.746			0.950			0.950		
Satd. Flow (perm)	1386	1810	0	1390	1809	0	1770	3539	1551	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			4				110			111
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		358			1313			2727			2346	
Travel Time (s)		9.8			25.6			53.1			45.7	
Confl. Bikes (#/hr)			1						1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	14	3	87	17	4	13	731	110	54	1303	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	17	0	87	21	0	13	731	110	54	1303	111
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	36.6	36.6		14.1	14.1		13.6	20.6	20.6	12.9	24.6	24.6
Total Split (s)	30.0	30.0		30.0	30.0		20.0	90.0	90.0	20.0	90.0	90.0
Total Split (%)	21.4%	21.4%		21.4%	21.4%		14.3%	64.3%	64.3%	14.3%	64.3%	64.3%
Maximum Green (s)	23.4	23.4		22.9	22.9		13.4	83.4	83.4	14.1	83.4	83.4
Yellow Time (s)	3.2	3.2		3.8	3.8		3.0	4.6	4.6	3.0	4.6	4.6
All-Red Time (s)	3.4	3.4		3.3	3.3		3.6	2.0	2.0	2.9	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		7.1	7.1		6.6	6.6	6.6	5.9	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		1.0	1.0		2.0	6.0	6.0	1.0	6.0	6.0
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	25.0	25.0	0.0	25.0	25.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	55.0	55.0	0.0	55.0	55.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	4.0	4.0									7.0	7.0
Flash Dont Walk (s)	26.0	26.0									10.0	10.0
Pedestrian Calls (#/hr)	0	0									0	0
Act Effct Green (s)	12.9	12.9		12.4	12.4		7.1	102.1	102.1	8.5	108.4	108.4

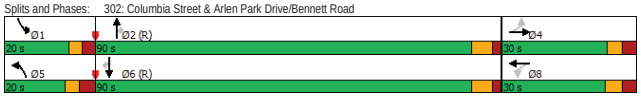
Existing (2023) PM.syn — VHB

UNC DP TIA 2023 — Existing (2023) PM
302: Columbia Street & Arlen Park Drive/Bennett Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.05	0.73	0.73	0.06	0.77	0.77
v/c Ratio	0.61	0.10		0.71	0.13		0.15	0.28	0.09	0.50	0.48	0.09
Control Delay	80.4	49.7		90.6	49.9		64.0	9.0	3.4	98.4	1.8	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.4	49.7		90.6	49.9		64.0	9.0	3.4	98.4	1.8	0.2
LOS	F	D		F	D		E	A	A	F	A	A
Approach Delay		74.9			82.7			9.1			5.2	
Approach LOS		E			F			A			A	
Queue Length 50th (ft)	70	12		79	15		12	121	0	52	14	0
Queue Length 95th (ft)	122	35		134	40		m28	184	m11	m87	m96	m0
Internal Link Dist (ft)		278			1233			2647			2266	
Turn Bay Length (ft)	150			150			350		350	350		350
Base Capacity (vph)	231	305		227	299		169	2580	1160	178	2740	1250
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.06		0.38	0.07		0.08	0.28	0.09	0.30	0.48	0.09

Intersection Summary
Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 12 (9%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 12.5 — Intersection LOS: B
Intersection Capacity Utilization 63.1% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 302: Columbia Street & Arlen Park Drive/Bennett Road



Existing (2023) PM.syn — VHB

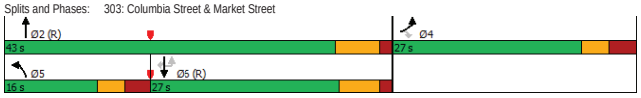
Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	306	116	112	442	9	1004	248
Future Volume (vph)	306	116	112	442	9	1004	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0	350		250		350
Storage Lanes	1	1	1		1		1
Taper Length (ft)	25		25		25		
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor		0.99					
Frt		0.850					0.850
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1770	1583	1770	3539	1770	3539	1583
Flt Permitted	0.950		0.950		0.473		
Satd. Flow (perm)	1770	1563	1770	3539	881	3539	1583
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		129					276
Link Speed (mph)	25			35		35	
Link Distance (ft)	416			1017		2727	
Travel Time (s)	11.3			19.8		53.1	
Confl. Bikes (#/hr)		1					
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	340	129	124	491	10	1116	276
Shared Lane Traffic (%)							
Lane Group Flow (vph)	340	129	124	491	10	1116	276
Turn Type	Prot	Perm	Prot	NA	Perm	NA	Perm
Protected Phases	4		5	2		6	
Permitted Phases		4			6		6
Detector Phase	4	4	5	2	6	6	6
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	12.0
Minimum Split (s)	13.1	13.1	12.8	20.4	20.0	20.0	20.0
Total Split (s)	27.0	27.0	16.0	43.0	27.0	27.0	27.0
Total Split (%)	38.6%	38.6%	22.9%	61.4%	38.6%	38.6%	38.6%
Maximum Green (s)	20.9	20.9	10.2	36.6	21.0	21.0	21.0
Yellow Time (s)	3.0	3.0	3.0	5.0	4.6	4.6	4.6
All-Red Time (s)	3.1	3.1	2.8	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	5.8	6.4	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	1.0	6.0	6.0	6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	40.0	45.0	45.0	45.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	17.6	17.6	8.5	39.9	28.5	28.5	28.5
Actuated g/C Ratio	0.25	0.25	0.12	0.57	0.41	0.41	0.41
v/c Ratio	0.76	0.26	0.58	0.24	0.03	0.77	0.34
Control Delay	35.6	5.5	40.0	8.5	13.3	26.3	5.9

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	5.5	40.0	8.5	13.3	26.3	5.9
LOS	D	A	D	A	B	C	A
Approach Delay	27.3			14.9		22.2	
Approach LOS	C			B		C	
Queue Length 50th (ft)	133	0	52	52	3	305	41
Queue Length 95th (ft)	210	35	99	84	m7	#530	100
Internal Link Dist (ft)	336			937		2647	
Turn Bay Length (ft)	150		350		250		350
Base Capacity (vph)	528	557	257	2015	359	1442	809
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.23	0.48	0.24	0.03	0.77	0.34

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 7 (10%), Referenced to phase 2:NBT and 6:SBTU, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 21.3 Intersection LOS: C
Intersection Capacity Utilization 65.8% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 303: Columbia Street & Market Street



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	184	24	11	137	33	14
Future Volume (vph)	184	24	11	137	33	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.984		0.875			
Flt Protected	0.958					0.966
Satd. Flow (prot)	1756	0	1630	0	0	1799
Flt Permitted	0.958					0.966
Satd. Flow (perm)	1756	0	1630	0	0	1799
Link Speed (mph)	25		25			25
Link Distance (ft)	398		535			551
Travel Time (s)	10.9		14.6			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	204	27	12	152	37	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	231	0	164	0	0	53
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 34.0% ICU Level of Service A
Analysis Period (min) 15

Intersection

Int Delay, s/veh 6.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	184	24	11	137	33	14
Future Vol, veh/h	184	24	11	137	33	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	204	27	12	152	37	16

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	178	88	0	0	164	0
Stage 1	88	-	-	-	-	-
Stage 2	90	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	812	970	-	-	1414	-
Stage 1	935	-	-	-	-	-
Stage 2	934	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	791	970	-	-	1414	-
Mov Cap-2 Maneuver	791	-	-	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	910	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	5.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 808	1414	-
HCM Lane V/C Ratio	-	- 0.286	0.026	-
HCM Control Delay (s)	-	- 11.2	7.6	0
HCM Lane LOS	-	- B	A	A
HCM 95th %tile Q(veh)	-	- 1.2	0.1	-

UNC DP TIA 2023 — Existing (2023) PM
307: Country Club Road & Boundary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	489	402	0	0	55
Future Volume (vph)	0	489	402	0	0	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	0	1611
Link Speed (mph)		25	25		30	
Link Distance (ft)		312	90		81	
Travel Time (s)		8.5	2.5		1.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	543	447	0	0	61
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	543	447	0	0	61
Sign Control		Free	Free		Yield	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 31.2% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
313: Ridge Road & Country Club Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2040	37	31	1496	94	328
Future Volume (vph)	2040	37	31	1496	94	328
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998				0.895	
Flt Protected				0.999	0.989	
Satd. Flow (prot)	1859	0	0	1861	1649	0
Flt Permitted				0.999	0.989	
Satd. Flow (perm)	1859	0	0	1861	1649	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	215			564	517	
Travel Time (s)	4.2			11.0	10.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2267	41	34	1662	104	364
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2308	0	0	1696	468	0
Sign Control	Free			Free	Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 141.7% — ICU Level of Service H
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
313: Ridge Road & Country Club Road — HCM 2010 TWSC

Intersection
Int Delay, s/veh 411.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2040	37	31	1496	94	328
Future Vol, veh/h	2040	37	31	1496	94	328
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2267	41	34	1662	104	364

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2308	0	4018	2288
Stage 1	-	-	-	-	2288	-
Stage 2	-	-	-	-	1730	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	217	-	~ 3	~ 50
Stage 1	-	-	-	-	~ 82	-
Stage 2	-	-	-	-	157	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	217	-	0	~ 50
Mov Cap-2 Maneuver	-	-	-	-	0	-
Stage 1	-	-	-	-	~ 82	-
Stage 2	-	-	-	-	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	$ 3925.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	50	-	-	217	-
HCM Lane V/C Ratio	9.378	-	-	0.159	-
HCM Control Delay (s)	$ 3925.9	-	-	24.7	0
HCM Lane LOS	F	-	-	C	A
HCM 95th %tile Q(veh)	55.5	-	-	0.6	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

UNC DP TIA 2023 — Existing (2023) PM
325: Columbia Street & Pittsboro Street — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	635	286	77	87	24
Future Volume (vph)	10	635	286	77	87	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			0%	4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.971	
Flt Protected	0.950			0.962		
Satd. Flow (prot)	0	1611	0	1792	1773	0
Flt Permitted	0.950			0.962		
Satd. Flow (perm)	0	1611	0	1792	1773	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	384			956	267	
Travel Time (s)	8.7			26.1	7.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	706	318	86	97	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	706	0	404	124	0
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization Err% — ICU Level of Service H
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
329: Pittsboro Street & Manning Drive — Lanes, Volumes, Timings

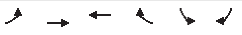


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	63	0	0	84	0	0
Future Volume (vph)	63	0	0	84	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850			
Flt Protected	0.950					
Satd. Flow (prot)	0	0	0	0	1770	1770
Flt Permitted	0.950					
Satd. Flow (perm)	0	0	0	0	1770	1770
Link Speed (mph)	25		30			25
Link Distance (ft)	218		384			1147
Travel Time (s)	5.9		8.7			31.3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	70	0	0	93	0	0
Shared Lane Traffic (%)					0%	
Lane Group Flow (vph)	70	0	93	0	0	0
Sign Control	Free		Free			Free

Intersection Summary

Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization Err%		ICU Level of Service H
Analysis Period (min) 15		

UNC DP TIA 2023 — Existing (2023) PM
350: Fordham Blvd & Oteys Road — Lanes, Volumes, Timings



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	102	82	82	385	454	165
Future Volume (vph)	102	82	82	385	454	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	10	10
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt			0.876			0.865
Flt Protected		0.973			0.950	
Satd. Flow (prot)	0	3444	3100	0	0	1504
Flt Permitted		0.973			0.950	
Satd. Flow (perm)	0	3444	3100	0	0	1504
Link Speed (mph)		45	45		25	
Link Distance (ft)		2437	1661		324	
Travel Time (s)		36.9	25.2		8.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	113	91	91	428	504	183
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	204	519	0	504	183
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization Err%		ICU Level of Service H
Analysis Period (min) 15		

UNC DP TIA 2023 — Existing (2023) PM
350: Fordham Blvd & Oteys Road — HCM 2010 TWSC

Intersection

Int Delay, s/veh	6.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	102	82	82	385	454	165
Future Vol, veh/h	102	82	82	385	454	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	113	91	91	428	504	183

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	519	0	-	0	577	260
Stage 1	-	-	-	-	305	-
Stage 2	-	-	-	-	272	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1043	-	-	-	~ 447	739
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	749	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1043	-	-	-	~ 396	739
Mov Cap-2 Maneuver	-	-	-	-	~ 396	-
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	749	-

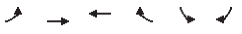
Approach	EB	WB	SB
HCM Control Delay, s	4.9	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1043	-	-	-	739
HCM Lane V/C Ratio	0.109	-	-	-	0.248
HCM Control Delay (s)	8.9	-	-	-	11.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.4	-	-	-	1

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

UNC DP TIA 2023 — Existing (2023) PM
357: Fordham Blvd & NC 54 WB Ramps — Lanes, Volumes, Timings



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	70	13	15	4	49	100
Future Volume (vph)	70	13	15	4	49	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt			0.971			0.865
Flt Protected		0.959			0.950	
Satd. Flow (prot)	0	3394	3437	0	0	1611
Flt Permitted		0.959			0.950	
Satd. Flow (perm)	0	3394	3437	0	0	1611
Link Speed (mph)		45	45		25	
Link Distance (ft)		1088	445		1226	
Travel Time (s)		16.5	6.7		33.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	14	17	4	54	111
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	92	21	0	54	111
Sign Control		Free	Free		Yield	

Intersection Summary

Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization Err%		ICU Level of Service H
Analysis Period (min) 15		

UNC DP TIA 2023 — Existing (2023) PM
358: NC 54 EB Ramps & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	116	0	0	112	0
Future Volume (vph)	0	116	0	0	112	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.850					
Flt Protected					0.950	
Satd. Flow (prot)	3008	0	0	3539	0	0
Flt Permitted					0.950	
Satd. Flow (perm)	3008	0	0	3539	0	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	445			1758	975	
Travel Time (s)	6.7			26.6	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	129	0	0	124	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	129	0	0	0	124	0
Sign Control	Free			Free	Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 76.5% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
359: Columbia Street & NC 54 EB Ramps — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	614	732	0	2007
Future Volume (vph)	0	0	614	732	0	2007
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt			0.918			
Flt Protected						
Satd. Flow (prot)	0	0	3249	0	0	3539
Flt Permitted						
Satd. Flow (perm)	0	0	3249	0	0	3539
Link Speed (mph)	35		25			25
Link Distance (ft)	424		550			219
Travel Time (s)	8.3		15.0			6.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	682	813	0	2230
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1495	0	0	2230
Sign Control	Free		Free			Free

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 58.8% — ICU Level of Service B
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
360: NC 54 EB Ramps & Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	70	0	0	732	0	0
Future Volume (vph)	70	0	0	732	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	1863	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	1863	0	0
Link Speed (mph)	30			35	30	
Link Distance (ft)	270			424	706	
Travel Time (s)	6.1			8.3	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	0	0	813	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	78	0	0	813	0	0
Sign Control	Free			Yield	Free	

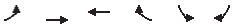
Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.1% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
361: NC 54 EB Ramps & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	730	0	0	1336	0	802
Future Volume (vph)	730	0	0	1336	0	802
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1611
Link Speed (mph)	45			45	30	
Link Distance (ft)	1758			301	706	
Travel Time (s)	26.6			4.6	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	811	0	0	1484	0	891
Shared Lane Traffic (%)						
Lane Group Flow (vph)	811	0	0	1484	0	891
Sign Control	Free			Free	Yield	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 76.5% — ICU Level of Service D
Analysis Period (min) 15

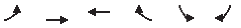
UNC DP TIA 2023 — Existing (2023) PM
362: Fordham Blvd & NC 54 WB Ramps — Lanes, Volumes, Timings



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1532	1336	1069	0	0
Future Volume (vph)	0	1532	1336	1069	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			250	0	0
Storage Lanes	0			1	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3539	3539	1583	0	0
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	1583	0	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		301	2437		1188	
Travel Time (s)		4.6	36.9		32.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1702	1484	1188	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1702	1484	1188	0	0
Sign Control		Free	Free		Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 69.5% — ICU Level of Service C
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
1051: US 15/501 NB & NB/EB U-Turn — Lanes, Volumes, Timings



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	351	2138	0	0	0	0
Future Volume (vph)	351	2138	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	3400	3505	0	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3400	3505	0	0	0	0
Link Speed (mph)		30	45		30	
Link Distance (ft)		605	492		205	
Travel Time (s)		13.8	7.5		4.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	390	2376	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	390	2376	0	0	0	0
Sign Control		Free	Free		Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 109.4% — ICU Level of Service H
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
1052: SB/WB U-Turn & US 15/501 SB — Lanes, Volumes, Timings



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	61	2075	0	0
Future Volume (vph)	0	0	61	2075	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	250		0	0
Storage Lanes		0	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00
Frt						
Flt Protected			0.950			
Satd. Flow (prot)	0	0	3433	3539	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	3433	3539	0	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	1322			777	186	
Travel Time (s)	20.0			11.8	4.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	68	2306	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	68	2306	0	0
Sign Control	Free			Free	Free	

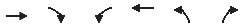
Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 75.6% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — Existing (2023) PM
5001: US 15/501/US 15/501 SB & US 15/501 NB — Lanes, Volumes, Timings



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	0	1406	0	1147	0	0
Future Volume (vph)	0	1406	0	1147	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	0	2787	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	0	2787	0	3539	0	0
Link Speed (mph)	45			45	45	
Link Distance (ft)	811			1322	1186	
Travel Time (s)	12.3			20.0	18.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1562	0	1274	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1562	0	1274	0	0
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 52.5% — ICU Level of Service A
Analysis Period (min) 15



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1662	0	2138
Future Volume (vph)	0	0	0	1662	0	2138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.88
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	0	2787
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	0	2787
Link Speed (mph)	45			45	45	
Link Distance (ft)	295			829	492	
Travel Time (s)	4.5			12.6	7.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1847	0	2376
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1847	0	2376
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 78.1% ICU Level of Service D
Analysis Period (min) 15

INTERSECTION LEVEL OF SERVICE WORKSHEETS
NO-BUILD (2030) AM

UNC DP TIA 2023 — No-Build (2030) AM
1: Columbia Street & Rosemary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	1	76	18	5	6	83	333	33	25	461	107
Future Volume (vph)	96	1	76	18	5	6	83	333	33	25	461	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	0		0	0		0	125		0	0		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			50			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.98	0.98		0.99	0.98		0.96	0.98		0.92		0.87
Frt		0.852			0.919			0.986				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1433	1393	0	1486	1410	0	1433	2885	0	1433	2867	1378
Flt Permitted	0.749			0.702			0.406			0.482		
Satd. Flow (perm)	1103	1393	0	1088	1410	0	586	2885	0	669	2867	1198
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		84			7			11				119
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		783			945			370			503	
Travel Time (s)		21.4			25.8			10.1			13.7	
Confl. Peds. (#/hr)	19		8	8		19	32		49	49		32
Confl. Bikes (#/hr)			5									4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	107	1	84	20	6	7	92	370	37	28	512	119
Shared Lane Traffic (%)												
Lane Group Flow (vph)	107	85	0	20	13	0	92	407	0	28	512	119
Turn Type	D.P+P	NA		D.Pm	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		4	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.8	31.0		31.0	32.0		12.8	22.8		12.1	21.8	12.8
Total Split (s)	16.0	48.0		48.0	32.0		16.0	49.0		13.0	46.0	16.0
Total Split (%)	14.5%	43.6%		43.6%	29.1%		14.5%	44.5%		11.8%	41.8%	14.5%
Maximum Green (s)	10.2	42.0		42.0	26.0		10.2	43.2		7.9	40.2	10.2
Yellow Time (s)	3.0	3.2		3.2	3.2		3.0	3.3		3.0	3.3	3.0
All-Red Time (s)	2.8	2.8		2.8	2.8		2.8	2.5		2.1	2.5	2.8
Lost Time Adjust (s)	-0.8	-0.8		-1.0	-1.0		-0.8	-0.8		0.1	0.1	-0.8
Total Lost Time (s)	5.0	5.2		5.0	5.0		5.0	5.0		5.2	5.9	5.0
Lead/Lag	Lag				Lead		Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Recall Mode	None	Ped		Ped	Ped		None	C-Max		None	C-Max	None
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)		18.0		18.0	19.0			10.0			9.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	34.8	39.6		39.8	27.0		56.2	52.9		56.9	46.5	55.2
Actuated g/C Ratio	0.32	0.36		0.36	0.25		0.51	0.48		0.52	0.42	0.50

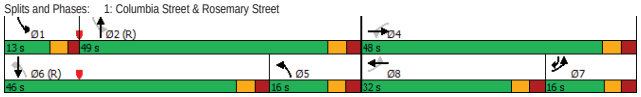
UNC DP TIA 2023 — No-Build (2030) AM
1: Columbia Street & Rosemary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.29	0.15		0.05	0.04		0.24	0.29		0.07	0.42	0.18
Control Delay	27.6	6.1		23.4	22.7		10.2	12.1		12.2	24.7	3.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	27.6	6.1		23.4	22.7		10.2	12.1		12.2	24.7	3.2
LOS	C	A		C	C		B	B		B	C	A
Approach Delay		18.0			23.1			11.8			20.3	
Approach LOS		B			C			B			C	
Queue Length 50th (ft)	52	0		9	3		14	57		9	138	0
Queue Length 95th (ft)	94	33		26	19		m30	80		23	187	28
Internal Link Dist (ft)		703			865			290			423	
Turn Bay Length (ft)							125					
Base Capacity (vph)	414	593		425	351		383	1393		403	1211	709
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.26	0.14		0.05	0.04		0.24	0.29		0.07	0.42	0.17

Intersection Summary

Area Type: CBD
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 84 (76%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.42
Intersection Signal Delay: 17.0 — Intersection LOS: B
Intersection Capacity Utilization 54.9% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Columbia Street & Rosemary Street



UNC DP TIA 2023 — No-Build (2030) AM
2: Columbia Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	275	36	75	336	116	33	283	85	100	423	53
Future Volume (vph)	54	275	36	75	336	116	33	283	85	100	423	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	0		0	250		0	600		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.90	0.99		0.93	0.95		0.97	0.94		0.87	0.99	
Frt		0.983			0.961			0.965			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1433	3085	0	1486	2700	0	1433	2707	0	1433	2796	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1289	3085	0	1378	2700	0	1394	2707	0	1241	2796	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			45			33			13	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		795			952			972			370	
Travel Time (s)		21.7			26.0			26.5			10.1	
Confl. Peds. (#/hr)	135		79	79		135	38		158	158		38
Confl. Bikes (#/hr)			1			6			1			4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	60	306	40	83	373	129	37	314	94	111	470	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	346	0	83	502	0	37	408	0	111	529	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.4	28.2		12.9	28.2		12.9	27.9		12.9	27.7	
Total Split (s)	17.0	36.0		20.0	39.0		13.0	31.0		23.0	41.0	
Total Split (%)	15.5%	32.7%		18.2%	35.5%		11.8%	28.2%		20.9%	37.3%	
Maximum Green (s)	11.6	29.8		14.1	32.8		7.1	25.1		17.1	35.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.3		3.0	3.1	
All-Red Time (s)	2.4	3.2		2.9	3.2		2.9	2.6		2.9	2.6	
Lost Time Adjust (s)	-0.4	-1.2		-0.9	-1.2		-0.9	-0.9		-0.9	-0.7	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	Ped		None	Ped	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	9.1	44.6		11.6	47.0		8.0	23.5		12.9	33.5	
Actuated g/C Ratio	0.08	0.41		0.11	0.43		0.07	0.21		0.12	0.30	

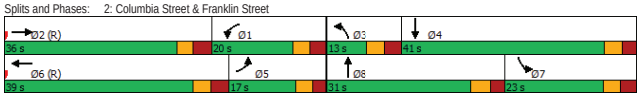
UNC DP TIA 2023 — No-Build (2030) AM
2: Columbia Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.51	0.28		0.53	0.43		0.36	0.67		0.66	0.61	
Control Delay	63.0	24.4		62.1	22.7		22.4	11.3		45.4	19.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	63.0	24.4		62.1	22.7		22.4	11.3		45.4	19.2	
LOS	E	C		E	C		C	B		D	B	
Approach Delay		30.1			28.3			12.2			23.8	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)	42	83		61	100		11	137		77	178	
Queue Length 95th (ft)	84	143		m107	214		m19	m150		132	221	
Internal Link Dist (ft)		715			872			892			290	
Turn Bay Length (ft)				250			600			125		
Base Capacity (vph)	156	1258		202	1178		105	665		234	935	
Starvation Cap Reductn	0	0		0	0		0	0		0	14	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.38	0.28		0.41	0.43		0.35	0.61		0.47	0.57	

Intersection Summary

Area Type: CBD
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 16 (15%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 23.8 — Intersection LOS: C
Intersection Capacity Utilization 65.3% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Columbia Street & Franklin Street



UNC DP TIA 2023 — No-Build (2030) AM
3: Raleigh Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	304	108	61	413	138	127	185	37	46	301	26
Future Volume (vph)	14	304	108	61	413	138	127	185	37	46	301	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	10	9	10	11	12	12	12	10	10	10
Storage Length (ft)	100		0	100		0	0		0	150		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.98		0.98	0.98			0.99		0.99	1.00	
Frt		0.961			0.962			0.986			0.988	
Flt Protected	0.950			0.950				0.982		0.950		
Satd. Flow (prot)	1433	2710	0	1433	2804	0	0	1618	0	1486	1541	0
Flt Permitted	0.373			0.480				0.699		0.514		
Satd. Flow (perm)	552	2710	0	709	2804	0	0	1146	0	797	1541	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		97			89			16			9	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1179			1100			994			364	
Travel Time (s)		32.2			30.0			27.1			9.9	
Confl. Peds. (#/hr)	19		15	15		19	29		17	17		29
Confl. Bikes (#/hr)			2			7			1			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	16	338	120	68	459	153	141	206	41	51	334	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	458	0	68	612	0	0	388	0	51	363	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		D.Pm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		6	6		7	4		4	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	19.8	19.8		19.8	19.8		8.0	20.0		20.0	20.0	
Total Split (s)	23.0	23.0		23.0	23.0		8.0	32.0		32.0	24.0	
Total Split (%)	41.8%	41.8%		41.8%	41.8%		14.5%	58.2%		58.2%	43.6%	
Maximum Green (s)	18.2	18.2		18.2	18.2		4.0	28.0		28.0	20.0	
Yellow Time (s)	3.3	3.3		3.1	3.1		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.7	1.7		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	-0.1	-0.1		-0.1	-0.1			-0.6		-1.2	-1.2	
Total Lost Time (s)	4.7	4.7		4.7	4.7			3.4		2.8	2.8	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)	4.0	4.0		4.0	4.0			5.0		5.0	5.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)	22.1	22.1		22.1	22.1			24.8		25.4	25.4	
Actuated g/C Ratio	0.40	0.40		0.40	0.40			0.45		0.46	0.46	

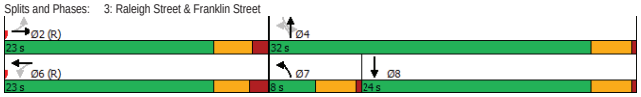
UNC DP TIA 2023 — No-Build (2030) AM
3: Raleigh Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.07	0.40		0.24	0.52			0.74		0.14	0.51	
Control Delay	9.1	8.5		12.3	10.7			20.5		7.9	12.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	9.1	8.5		12.3	10.7			20.5		7.9	12.0	
LOS	A	A		B	B			C		A	B	
Approach Delay		8.5			10.8			20.5			11.5	
Approach LOS		A			B			C			B	
Queue Length 50th (ft)	3	38		8	24			84		8	68	
Queue Length 95th (ft)	m9	56		21	43			164		22	117	
Internal Link Dist (ft)		1099			1020			914			284	
Turn Bay Length (ft)	100			100						150		
Base Capacity (vph)	223	1153		286	1186			606		425	742	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.07	0.40		0.24	0.52			0.64		0.12	0.49	

Intersection Summary

Area Type: CBD
Cycle Length: 55
Actuated Cycle Length: 55
Offset: 16 (29%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 12.3 — Intersection LOS: B
Intersection Capacity Utilization 81.7% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Raleigh Street & Franklin Street



UNC DP TIA 2023 — No-Build (2030) AM
4: Merritt Mill Road & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lane Configurations							
Traffic Volume (vph)	53	36	149	345	139	87	
Future Volume (vph)	53	36	149	345	139	87	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	14	15	15	9	12	
Storage Length (ft)	0	250		0	25		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	0.93	0.91	0.97		1.00		
Frt		0.850	0.906				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1699	1520	1616	0	1433	1676	
Flt Permitted	0.950				0.325		
Satd. Flow (perm)	1581	1387	1616	0	490	1676	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		40	154				
Link Speed (mph)	25		25			25	
Link Distance (ft)	1645		945			1064	
Travel Time (s)	44.9		25.8			29.0	
Confl. Peds. (#/hr)	12	22		1	1		
Confl. Bikes (#/hr)		2		22			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	59	40	166	383	154	97	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	59	40	549	0	154	97	
Turn Type	Prot	pm+ov	NA		D.P+P	NA	
Protected Phases	3	1	2		1	6	4
Permitted Phases		3			2		
Detector Phase	3	1	2		1	6	
Switch Phase							
Minimum Initial (s)	7.0	7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.1	11.6	14.9		11.6	14.9	25.0
Total Split (s)	12.1	12.0	30.9		12.0	42.9	25.0
Total Split (%)	15.1%	15.0%	38.6%		15.0%	53.6%	31%
Maximum Green (s)	7.0	7.4	26.0		7.4	38.0	22.0
Yellow Time (s)	3.0	3.0	3.1		3.0	3.1	3.0
All-Red Time (s)	2.1	1.6	1.8		1.6	1.8	0.0
Lost Time Adjust (s)	0.1	0.4	0.1		0.4	0.4	
Total Lost Time (s)	5.2	5.0	5.0		5.0	5.3	
Lead/Lag	Lead	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Vehicle Extension (s)	1.0	2.0	3.0		2.0	3.0	0.2
Recall Mode	None	None	Min		None	Min	None
Walk Time (s)							7.0
Flash Dont Walk (s)							15.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	7.2	10.9	22.1		29.2	36.9	
Actuated g/C Ratio	0.16	0.24	0.48		0.63	0.80	

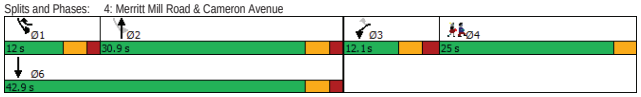
UNC DP TIA 2023 — No-Build (2030) AM
4: Merritt Mill Road & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
v/c Ratio	0.22	0.11	0.64		0.34	0.07	
Control Delay	22.6	5.7	11.6		5.4	2.9	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	22.6	5.7	11.6		5.4	2.9	
LOS	C	A	B		A	A	
Approach Delay	15.8		11.6			4.4	
Approach LOS	B		B			A	
Queue Length 50th (ft)	15	0	87		13	8	
Queue Length 95th (ft)	46	16	180		28	19	
Internal Link Dist (ft)	1565		865			984	
Turn Bay Length (ft)		250			25		
Base Capacity (vph)	266	385	1016		463	1352	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.22	0.10	0.54		0.33	0.07	

Intersection Summary

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 46.1
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 10.1 — Intersection LOS: B
Intersection Capacity Utilization 59.4% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Merritt Mill Road & Cameron Avenue



UNC DP TIA 2023 — No-Build (2030) AM
5: Pittsboro Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø4
Lane Configurations								
Traffic Volume (vph)	144	149	507	185	0	0		
Future Volume (vph)	144	149	507	185	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	12	11	12	12	12		
Storage Length (ft)		0	0		0	0		
Storage Lanes		0	2		0	0		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00		
Ped Bike Factor	0.96		1.00					
Frt	0.931							
Flt Protected			0.950					
Satd. Flow (prot)	1500	0	2987	1676	0	0		
Flt Permitted			0.950					
Satd. Flow (perm)	1500	0	2977	1676	0	0		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)	96							
Link Speed (mph)	25			25	25			
Link Distance (ft)	1117			376	564			
Travel Time (s)	30.5			10.3	15.4			
Confl. Peds. (#/hr)		2	2		31			
Confl. Bikes (#/hr)		81						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Adj. Flow (vph)	160	166	563	206	0	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	326	0	563	206	0	0		
Turn Type	NA		Prot	NA				
Protected Phases	2		1 4	6			1	4
Permitted Phases								
Detector Phase	2		1 4	6				
Switch Phase								
Minimum Initial (s)	10.0			10.0			7.0	7.0
Minimum Split (s)	16.2			15.0			12.1	20.0
Total Split (s)	21.0			35.0			14.0	20.0
Total Split (%)	38.2%			63.6%			25%	36%
Maximum Green (s)	15.8			30.0			8.9	16.0
Yellow Time (s)	3.1			3.3			3.0	3.0
All-Red Time (s)	2.1			1.7			2.1	1.0
Lost Time Adjust (s)	-0.2			0.0				
Total Lost Time (s)	5.0			5.0				
Lead/Lag	Lead						Lag	
Lead-Lag Optimize?								
Vehicle Extension (s)	1.0			1.0			4.0	0.2
Recall Mode	Min			C-Min			C-Max	None
Walk Time (s)	7.0							7.0
Flash Dont Walk (s)	4.0							9.0
Pedestrian Calls (#/hr)	0							0
Act Effct Green (s)	13.5		31.5	38.6				
Actuated g/C Ratio	0.25		0.57	0.70				

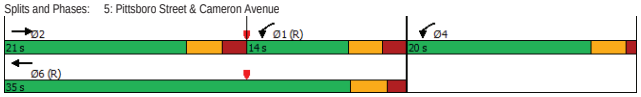
UNC DP TIA 2023 — No-Build (2030) AM
5: Pittsboro Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø4
v/c Ratio	0.74		0.33	0.18				
Control Delay	23.4		3.7	2.6				
Queue Delay	0.0		0.0	0.0				
Total Delay	23.4		3.7	2.6				
LOS	C		A	A				
Approach Delay	23.4			3.4				
Approach LOS	C			A				
Queue Length 50th (ft)	69		32	8				
Queue Length 95th (ft)	124		m50	m56				
Internal Link Dist (ft)	1037			296	484			
Turn Bay Length (ft)								
Base Capacity (vph)	519		2174	1175				
Starvation Cap Reductn	0		0	0				
Spillback Cap Reductn	0		0	0				
Storage Cap Reductn	0		0	0				
Reduced v/c Ratio	0.63		0.26	0.18				

Intersection Summary

Area Type: CBD
Cycle Length: 55
Actuated Cycle Length: 55
Offset: 20 (36%), Referenced to phase 1:WBL and 6:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 9.3 — Intersection LOS: A
Intersection Capacity Utilization 43.1% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Pittsboro Street & Cameron Avenue



No-Build (2030) AM.syn — VHB

UNC DP TIA 2023 — No-Build (2030) AM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	88	0	0	125	37	107	362	30	77	0	503
Future Volume (vph)	20	88	0	0	125	37	107	362	30	77	0	503
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	10	10	10	11	11	12
Storage Length (ft)	110		0	0		0	0		0	300		0
Storage Lanes	1		0	0		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.95	1.00	1.00	0.88
Ped Bike Factor	0.92				0.97		0.91	0.96		0.71		0.88
Frt					0.969			0.989				0.850
Flt Protected	0.950						0.950	0.999		0.950		
Satd. Flow (prot)	1540	1676	0	0	1580	0	1353	2699	0	1540	0	2508
Flt Permitted	0.449						0.950	0.999		0.950		
Satd. Flow (perm)	671	1676	0	0	1580	0	1230	2692	0	1090	0	2207
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)					13			6				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		376			2112			887			972	
Travel Time (s)		10.3			57.6			24.2			26.5	
Confl. Peds. (#/hr)	80		194	194		80	33		156	156		33
Confl. Bikes (#/hr)			58			2			2			7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	22	98	0	0	139	41	119	402	33	86	0	559
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	22	98	0	0	180	0	107	447	0	86	0	559
Turn Type	Perm	NA			NA		Split	NA		Prot		Prot
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Detector Phase	4	4			8		2	2		1		1
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		7.0	7.0		7.0		7.0
Minimum Split (s)	27.1	27.1			30.2		23.2	23.2		25.6		25.6
Total Split (s)	30.2	30.2			30.2		23.7	23.7		28.1		28.1
Total Split (%)	27.5%	27.5%			27.5%		21.5%	21.5%		25.5%		25.5%
Maximum Green (s)	24.1	24.1			24.0		17.5	17.5		22.5		22.5
Yellow Time (s)	3.1	3.1			3.2		3.1	3.1		3.0		3.0
All-Red Time (s)	3.0	3.0			3.0		3.1	3.1		2.6		2.6
Lost Time Adjust (s)	-1.2	-1.2			-1.2		-1.2	-1.2		-0.6		-0.6
Total Lost Time (s)	4.9	4.9			5.0		5.0	5.0		5.0		5.0
Lead/Lag							Lag	Lag		Lead		Lead
Lead-Lag Optimize?							Yes	Yes		Yes		Yes
Vehicle Extension (s)	2.0	2.0			2.0		4.0	4.0		4.0		4.0
Recall Mode	Min	Min			Min		C-Max	C-Max		None		None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0		7.0
Flash Dont Walk (s)	10.0	10.0			17.0		5.0	5.0		13.0		13.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0		0
Act Effct Green (s)	17.5	17.5			17.4		18.8	18.8		30.8		30.8
Actuated g/C Ratio	0.16	0.16			0.16		0.17	0.17		0.28		0.28

No-Build (2030) AM.syn — VHB

UNC DP TIA 2023 — No-Build (2030) AM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	25%
Maximum Green (s)	24.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	0.2
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	

No-Build (2030) AM.syn — VHB

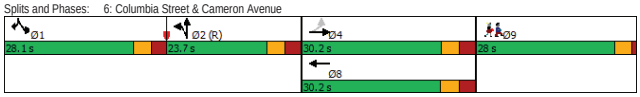
UNC DP TIA 2023 — No-Build (2030) AM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.21	0.37			0.69		0.46	0.96		0.20		0.80
Control Delay	32.0	33.0			53.8		44.3	74.7		14.1		27.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		0.0
Total Delay	32.0	33.0			53.8		44.3	74.7		14.1		27.3
LOS	C	C			D		D	E		B		C
Approach Delay		32.9			53.8			68.8			25.5	
Approach LOS		C			D			E			C	
Queue Length 50th (ft)	10	45			113		76	173		17		63
Queue Length 95th (ft)	m15	m66			176		113	#265		m38		#343
Internal Link Dist (ft)		296			2032			807			892	
Turn Bay Length (ft)	110									300		
Base Capacity (vph)	154	385			371		231	465		431		702
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		0
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.14	0.25			0.49		0.46	0.96		0.20		0.80

Intersection Summary

Area Type: CBD
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 32 (29%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 45.5 — Intersection LOS: D
Intersection Capacity Utilization 66.0% — ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Columbia Street & Cameron Avenue



UNC DP TIA 2023 — No-Build (2030) AM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	Ø9
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — No-Build (2030) AM
7: Raleigh Street & Cameron Avenue/Country Club Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	61	30	32	165	275	33	42	12	276	155	50
Future Volume (vph)	18	61	30	32	165	275	33	42	12	276	155	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	9	11	11	10	10	10	10	12	12
Storage Length (ft)	0		0	100		0	100		0	75		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			100			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96		0.94	0.92		0.88	0.94		0.82	0.96	
Frt		0.963			0.906			0.967			0.963	
Flt Protected		0.992		0.950			0.950			0.950		
Satd. Flow (prot)	0	1545	0	1433	1351	0	1486	1428	0	1486	1542	0
Flt Permitted		0.898		0.628			0.616			0.450		
Satd. Flow (perm)	0	1387	0	890	1351	0	853	1428	0	580	1542	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					124			13			20	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2112			312			770			994	
Travel Time (s)		57.6			8.5			21.0			27.1	
Confl. Peds. (#/hr)	37		34	34		37	52		77	77		52
Confl. Bikes (#/hr)			12			6			8			7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	20	68	33	36	183	306	37	47	13	307	172	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	121	0	36	489	0	37	60	0	307	228	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.1	21.1		12.6	21.6		12.3	21.3		11.9	19.1	
Total Split (s)	29.0	29.0		12.6	41.6		12.3	21.4		22.0	31.1	
Total Split (%)	34.1%	34.1%		14.8%	48.9%		14.5%	25.2%		25.9%	36.6%	
Maximum Green (s)	22.9	22.9		7.0	36.0		7.0	16.1		17.1	26.0	
Yellow Time (s)	3.3	3.3		3.0	3.1		3.0	3.1		3.0	3.1	
All-Red Time (s)	2.8	2.8		2.6	2.5		2.3	2.2		1.9	2.0	
Lost Time Adjust (s)		-1.1		-0.6	-0.6		-0.3	-0.3		0.1	-0.1	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)	7.0	7.0			7.0			7.0			7.0	
Flash Dont Walk (s)	8.0	8.0			8.0			7.0			7.0	
Pedestrian Calls (#/hr)	0	0			0			0			0	
Act Effct Green (s)		37.8		45.4	45.4		14.7	8.9		29.6	22.2	
Actuated g/C Ratio		0.44		0.53	0.53		0.17	0.10		0.35	0.26	

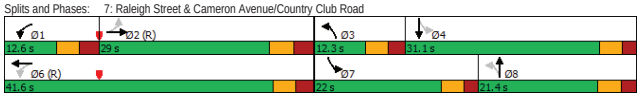
UNC DP TIA 2023 — No-Build (2030) AM
7: Raleigh Street & Cameron Avenue/Country Club Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.20		0.07	0.63		0.18	0.37		0.78	0.55	
Control Delay		20.4		12.5	16.2		20.2	31.2		36.5	29.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		20.4		12.5	16.2		20.2	31.2		36.5	29.8	
LOS		C		B	B		C	C		D	C	
Approach Delay		20.4			16.0			27.0			33.7	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)		44		9	133		9	24		128	100	
Queue Length 95th (ft)		92		26	270		28	42		#212	166	
Internal Link Dist (ft)		2032			232			690			914	
Turn Bay Length (ft)				100			100			75		
Base Capacity (vph)		616		524	780		202	286		406	505	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.20		0.07	0.63		0.18	0.21		0.76	0.45	

Intersection Summary

Area Type: CBD
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 12 (14%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 24.6 — Intersection LOS: C
Intersection Capacity Utilization 69.2% — ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Raleigh Street & Cameron Avenue/Country Club Road



UNC DP TIA 2023 — No-Build (2030) AM
8: Pittsboro Street & McCauley Street/South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	112	25	176	56	0	0	0	0	94	501	9
Future Volume (vph)	0	112	25	176	56	0	0	0	0	94	501	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			50			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor		0.98		0.92							0.97	
Frt		0.975									0.998	
Flt Protected				0.950							0.992	
Satd. Flow (prot)	0	1435	0	1593	1676	0	0	0	0	0	3145	0
Flt Permitted				0.660							0.992	
Satd. Flow (perm)	0	1435	0	1016	1676	0	0	0	0	0	3068	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25									3	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1050			519			1147			237	
Travel Time (s)		28.6			14.2			31.3			6.5	
Confl. Peds. (#/hr)	85		80	80		85	75		86	86		75
Confl. Bikes (#/hr)			48			1						32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)		0	0									
Adj. Flow (vph)	0	124	28	196	62	0	0	0	0	104	557	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	152	0	196	62	0	0	0	0	0	671	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		22.8		23.6	23.6					23.3	23.3	
Total Split (s)		27.0		27.0	27.0					28.0	28.0	
Total Split (%)		49.1%		49.1%	49.1%					50.9%	50.9%	
Maximum Green (s)		22.2		21.4	21.4					22.7	22.7	
Yellow Time (s)		3.3		3.0	3.0					3.3	3.3	
All-Red Time (s)		1.5		2.6	2.6					2.0	2.0	
Lost Time Adjust (s)		-0.3		-0.3	-0.3						-0.1	
Total Lost Time (s)		4.5		5.3	5.3						5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		Ped		Ped	Ped					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		6.0		7.0	7.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		17.9		17.1	17.1						27.4	
Actuated g/C Ratio		0.33		0.31	0.31						0.50	

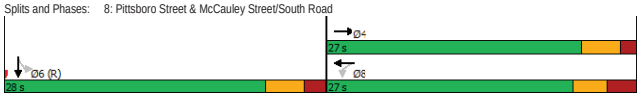
UNC DP TIA 2023 — No-Build (2030) AM
8: Pittsboro Street & McCauley Street/South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.31		0.62	0.12						0.44	
Control Delay		12.5		19.4	7.4						4.7	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		12.5		19.4	7.4						4.7	
LOS		B		B	A						A	
Approach Delay		12.5			16.5						4.7	
Approach LOS		B			B						A	
Queue Length 50th (ft)		31		68	18						27	
Queue Length 95th (ft)		58		126	m8						65	
Internal Link Dist (ft)		970			439			1067			157	
Turn Bay Length (ft)				100								
Base Capacity (vph)		601		400	661						1528	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.25		0.49	0.09						0.44	

Intersection Summary

Area Type: CBD
Cycle Length: 55
Actuated Cycle Length: 55
Offset: 32 (58%), Referenced to phase 6:SBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 8.6 — Intersection LOS: A
Intersection Capacity Utilization 53.0% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Pittsboro Street & McCauley Street/South Road



UNC DP TIA 2023 — No-Build (2030) AM
9: Columbia Street & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	250	0	0	260	105	63	378	226	0	0	0
Future Volume (vph)	22	250	0	0	260	105	63	378	226	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	13	13	12	11	11	11	11	11
Storage Length (ft)	75		0	0		125	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.95				1.00	0.91		0.91				
Frt					0.994	0.850		0.949				
Flt Protected	0.950							0.995				
Satd. Flow (prot)	1593	1788	0	0	1630	1399	0	3822	0	0	0	0
Flt Permitted	0.950							0.995				
Satd. Flow (perm)	1512	1788	0	0	1630	1276	0	3795	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4	169		230				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		519			696			500			887	
Travel Time (s)		14.2			19.0			13.6			24.2	
Confl. Peds. (#/hr)	79		131	131		79	56		176	176		56
Confl. Bikes (#/hr)			20			1			8			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	24	278	0	0	289	117	70	420	251	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	24	278	0	0	301	105	0	741	0	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA				
Protected Phases	7	4			8			2				
Permitted Phases						8	2					
Detector Phase	7	4			8	8	2	2				
Switch Phase												
Minimum Initial (s)	4.0	7.0			7.0	7.0	10.0	10.0				
Minimum Split (s)	8.0	12.6			20.0	20.0	26.9	26.9				
Total Split (s)	8.0	28.0			20.0	20.0	27.0	27.0				
Total Split (%)	14.5%	50.9%			36.4%	36.4%	49.1%	49.1%				
Maximum Green (s)	4.0	22.4			17.0	17.0	21.1	21.1				
Yellow Time (s)	3.5	3.5			3.0	3.0	3.4	3.4				
All-Red Time (s)	0.5	2.1			0.0	0.0	2.5	2.5				
Lost Time Adjust (s)	-0.6	-0.6			-0.5	-0.5		-0.9				
Total Lost Time (s)	3.4	5.0			2.5	2.5		5.0				
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	2.0			0.2	0.2	2.0	2.0				
Recall Mode	None	None			None	None	C-Min	C-Min				
Walk Time (s)					7.0	7.0	7.0	7.0				
Flash Dont Walk (s)					10.0	10.0	14.0	14.0				
Pedestrian Calls (#/hr)					0	0	0	0				
Act Effct Green (s)	6.5	15.0			15.6	15.6		30.0				
Actuated g/C Ratio	0.12	0.27			0.28	0.28		0.55				

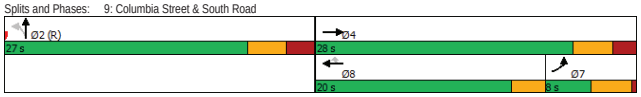
UNC DP TIA 2023 — No-Build (2030) AM
9: Columbia Street & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.13	0.57			0.65	0.22		0.34				
Control Delay	23.3	21.3			23.5	2.0		6.4				
Queue Delay	0.0	0.0			0.0	0.0		0.0				
Total Delay	23.3	21.3			23.5	2.0		6.4				
LOS	C	C			C	A		A				
Approach Delay		21.5			18.0			6.4				
Approach LOS		C			B			A				
Queue Length 50th (ft)	8	94			87	0		26				
Queue Length 95th (ft)	m20	84			148	10		74				
Internal Link Dist (ft)		439			616			420			807	
Turn Bay Length (ft)	75					125						
Base Capacity (vph)	189	767			534	530		2213				
Starvation Cap Reductn	0	0			0	0		0				
Spillback Cap Reductn	0	0			0	0		0				
Storage Cap Reductn	0	0			0	0		0				
Reduced v/c Ratio	0.13	0.36			0.56	0.20		0.33				

Intersection Summary

Area Type: CBD
Cycle Length: 55
Actuated Cycle Length: 55
Offset: 17 (31%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 12.8 — Intersection LOS: B
Intersection Capacity Utilization 53.0% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Columbia Street & South Road



UNC DP TIA 2023 — No-Build (2030) AM
10: South Road & Raleigh Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	58	220	349	25	47	119
Future Volume (vph)	58	220	349	25	47	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	11	11
Storage Length (ft)	225			190	75	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93			0.85	0.79	0.47
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	1676	1621	1378	1540	1378
Flt Permitted	0.505				0.950	
Satd. Flow (perm)	791	1676	1621	1168	1216	653
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				28		132
Link Speed (mph)		25	25		25	
Link Distance (ft)		516	1148		454	
Travel Time (s)		14.1	31.3		12.4	
Confl. Peds. (#/hr)	72			72	94	243
Confl. Bikes (#/hr)				3		14
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	64	244	388	28	52	132
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	244	388	28	52	132
Turn Type	D.P+P	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	6			6		4
Detector Phase	5	2	6	6	4	5
Switch Phase						
Minimum Initial (s)	7.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	12.6	15.8	28.8	28.8	24.8	12.6
Total Split (s)	15.0	60.0	45.0	45.0	25.0	15.0
Total Split (%)	17.6%	70.6%	52.9%	52.9%	29.4%	17.6%
Maximum Green (s)	9.4	54.2	39.2	39.2	19.2	9.4
Yellow Time (s)	3.0	3.2	3.2	3.2	3.0	3.0
All-Red Time (s)	2.6	2.6	2.6	2.6	2.8	2.6
Lost Time Adjust (s)	-0.6	-0.7	-0.8	-0.8	-0.6	-0.6
Total Lost Time (s)	5.0	5.1	5.0	5.0	5.2	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Vehicle Extension (s)	1.0	3.0	1.0	1.0	2.0	1.0
Recall Mode	None	C-Min	Min	Min	None	None
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			16.0	16.0	12.0	
Pedestrian Calls (#/hr)			0	0	0	
Act Effct Green (s)	66.2	73.2	58.6	58.6	8.7	13.4
Actuated g/C Ratio	0.78	0.86	0.69	0.69	0.10	0.16

UNC DP TIA 2023 — No-Build (2030) AM
10: South Road & Raleigh Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.09	0.17	0.35	0.03	0.33	0.47
Control Delay	1.7	1.5	7.8	2.8	36.7	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.7	1.5	7.8	2.8	36.7	8.2
LOS	A	A	A	A	D	A
Approach Delay		1.6	7.5		16.2	
Approach LOS		A	A		B	
Queue Length 50th (ft)	9	46	88	0	12	0
Queue Length 95th (ft)	m3	10	156	10	m42	6
Internal Link Dist (ft)		436	1068		374	
Turn Bay Length (ft)	225			190	75	
Base Capacity (vph)	732	1443	1118	814	358	313
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.17	0.35	0.03	0.15	0.42

Intersection Summary

Area Type: CBD
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 43 (51%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 7.2 — Intersection LOS: A
Intersection Capacity Utilization 54.7% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: South Road & Raleigh Street



UNC DP TIA 2023 — No-Build (2030) AM
11: Country Club Road & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	180	33	469	400	497	20	42	40	282	168	12
Future Volume (vph)	5	180	33	469	400	497	20	42	40	282	168	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	14	12	12	14	12	15	12	11	16	12
Storage Length (ft)	0		0	200		0	0		0	75		0
Storage Lanes	1		0	1		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor	0.95	0.99		0.99		0.91		0.99	0.99		1.00	
Frt		0.977				0.850			0.850		0.992	
Flt Protected	0.950			0.950				0.984		0.950	0.989	
Satd. Flow (prot)	1711	3440	0	1770	1863	1689	0	2016	1583	1625	1963	0
Flt Permitted	0.506			0.532				0.984		0.950	0.989	
Satd. Flow (perm)	865	3440	0	984	1863	1541	0	2002	1561	1625	1963	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				453			92		2	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		362			1042			215			421	
Travel Time (s)		9.9			28.4			4.2			11.5	
Confl. Peds. (#/hr)	39		5	5		39	30					30
Confl. Bikes (#/hr)			1			5			3			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	200	37	521	444	552	22	47	44	313	187	13
Shared Lane Traffic (%)										19%		
Lane Group Flow (vph)	6	237	0	521	444	552	0	69	44	254	259	0
Turn Type	Perm	NA		pm+pt	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases		2		1	6	4	3	3	1	4	4	
Permitted Phases	2			6		6		3	3			
Detector Phase	2	2		1	6	4	3	3	1	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	33.1	33.1		12.1	31.1	42.0	13.6	13.6	12.1	42.0	42.0	
Total Split (s)	33.4	33.4		31.0	64.4	42.0	13.6	13.6	31.0	42.0	42.0	
Total Split (%)	27.8%	27.8%		25.8%	53.7%	35.0%	11.3%	11.3%	25.8%	35.0%	35.0%	
Maximum Green (s)	27.3	27.3		25.9	58.3	35.0	7.0	7.0	25.9	35.0	35.0	
Yellow Time (s)	3.7	3.7		3.0	3.7	3.1	3.3	3.3	3.0	3.1	3.1	
All-Red Time (s)	2.4	2.4		2.1	2.4	3.9	3.3	3.3	2.1	3.9	3.9	
Lost Time Adjust (s)	-0.7	-0.7		-0.1	-0.6	-1.7		-1.3	-0.1	-1.7	-1.7	
Total Lost Time (s)	5.4	5.4		5.0	5.5	5.3		5.3	5.0	5.3	5.3	
Lead/Lag	Lag	Lag		Lead		Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?						Yes				Yes	Yes	
Vehicle Extension (s)	3.0	3.0		1.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	
Recall Mode	C-Min	C-Min		None	C-Min	None	None	None	None	None	None	
Walk Time (s)	7.0	7.0			7.0	7.0				7.0	7.0	
Flash Dont Walk (s)	20.0	20.0			18.0	28.0				28.0	28.0	
Pedestrian Calls (#/hr)	0	0			0	0				0	0	
Act Effct Green (s)	42.6	42.6		73.0	72.5	97.3		9.6	33.2	24.6	24.6	
Actuated g/C Ratio	0.36	0.36		0.61	0.60	0.81		0.08	0.28	0.20	0.20	

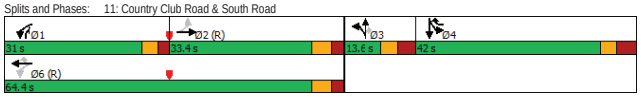
UNC DP TIA 2023 — No-Build (2030) AM
11: Country Club Road & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.02	0.19		0.68	0.39	0.40		0.43	0.09	0.77	0.64	
Control Delay	39.8	31.6		21.0	16.1	1.4		60.7	0.3	57.9	48.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.1	0.2	
Total Delay	39.8	31.6		21.0	16.1	1.4		60.7	0.3	58.0	48.8	
LOS	D	C		C	B	A		E	A	E	D	
Approach Delay		31.8			12.4			37.2			53.3	
Approach LOS		C			B			D			D	
Queue Length 50th (ft)	3	64		223	178	10		52	0	195	193	
Queue Length 95th (ft)	17	126		395	317	32		98	1	241	217	
Internal Link Dist (ft)		282			962			135			341	
Turn Bay Length (ft)				200						75		
Base Capacity (vph)	322	1292		790	1126	1425		160	555	496	601	
Starvation Cap Reductn	0	0		0	0	0		0	0	12	44	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.02	0.18		0.66	0.39	0.39		0.43	0.08	0.52	0.46	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 4 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 24.4 — Intersection LOS: C
Intersection Capacity Utilization 87.1% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 11: Country Club Road & South Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	346	0	59	0	151	0	444	192	0	0	0
Future Volume (vph)	81	346	0	59	0	151	0	444	192	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			4%			-4%			0%	
Storage Length (ft)	100		0	0		0	100		150	0		0
Storage Lanes	1		0	1		2	1		1	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.86			0.90		0.80			0.98			
Frt						0.850			0.850			
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1778	3557	0	1734	0	2731	0	3610	1615	0	0	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1535	3557	0	1557	0	2178	0	3610	1575	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	198					184			142			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		218			284			267			526	
Travel Time (s)		5.9			7.7			7.3			14.3	
Confl. Peds. (#/hr)	40		87	87		40	14		10	10		14
Confl. Bikes (#/hr)			15						6			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	90	384	0	66	0	168	0	493	213	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	384	0	66	0	168	0	493	213	0	0	0
Turn Type	Prot	NA		Prot		Perm		NA	pm+ov			
Protected Phases	7	4		3				2	3			
Permitted Phases						3		2	2			
Detector Phase	7	4		3		3		2	3			
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0		7.0		10.0	7.0			
Minimum Split (s)	11.9	25.6		12.9		12.9		30.0	12.9			
Total Split (s)	12.0	34.0		13.6		13.6		32.4	13.6			
Total Split (%)	15.0%	42.5%		17.0%		17.0%		40.5%	17.0%			
Maximum Green (s)	7.1	28.4		7.7		7.7		26.4	7.7			
Yellow Time (s)	3.0	3.2		3.0		3.0		3.4	3.0			
All-Red Time (s)	1.9	2.4		2.9		2.9		2.6	2.9			
Lost Time Adjust (s)	0.1	-0.6		-0.9		-0.9		-1.0	-0.9			
Total Lost Time (s)	5.0	5.0		5.0		5.0		5.0	5.0			
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	1.0	1.0		1.0		1.0		3.0	1.0			
Recall Mode	None	None		None		None		Min	None			
Walk Time (s)		4.0						4.0				
Flash Dont Walk (s)		16.0						20.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	7.0	13.7		8.1		8.1		13.7	21.8			
Actuated g/C Ratio	0.14	0.27		0.16		0.16		0.27	0.43			

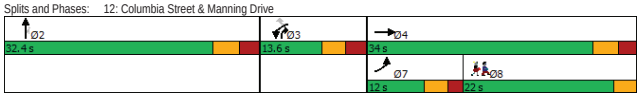
Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	28%
Maximum Green (s)	19.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.22	0.40		0.24		0.33		0.51	0.28			
Control Delay	1.2	16.8		22.8		5.8		18.0	3.8			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	1.2	16.8		22.8		5.8		18.0	3.8			
LOS	A	B		C		A		B	A			
Approach Delay		13.8			10.6			13.7				
Approach LOS		B			B			B				
Queue Length 50th (ft)	0	47		18		0		67	10			
Queue Length 95th (ft)	0	88		50		21		106	35			
Internal Link Dist (ft)		138			204			187			446	
Turn Bay Length (ft)	100								150			
Base Capacity (vph)	418	2059		297		526		1974	782			
Starvation Cap Reductn	0	0		0		0		0	0			
Spillback Cap Reductn	0	0		0		0		0	0			
Storage Cap Reductn	0	0		0		0		0	0			
Reduced v/c Ratio	0.22	0.19		0.22		0.32		0.25	0.27			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 50.6
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 13.2 — Intersection LOS: B
Intersection Capacity Utilization 49.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 12: Columbia Street & Manning Drive



Lane Group	Ø8
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — No-Build (2030) AM
13: West Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	373	110	97	186	13	14	12	7	8	9	16
Future Volume (vph)	27	373	110	97	186	13	14	12	7	8	9	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			3%			0%			-3%	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.93			0.97			0.98			0.96	0.99
Frt		0.968			0.994			0.971				0.850
Flt Protected		0.997			0.984			0.979			0.977	
Satd. Flow (prot)	0	3246	0	0	3407	0	0	1734	0	0	1847	1607
Flt Permitted		0.924			0.686			0.851			0.831	
Satd. Flow (perm)	0	3008	0	0	2296	0	0	1507	0	0	1511	1587
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		53			9			8				88
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		388			334			349			293	
Travel Time (s)		7.6			6.5			9.5			8.0	
Confl. Peds. (#/hr)			107	107					66	66		
Confl. Bikes (#/hr)			7			2			1			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	30	414	122	108	207	14	16	13	8	9	10	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	566	0	0	329	0	0	37	0	0	19	18
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		4.0	4.0		7.0	7.0	7.0
Minimum Split (s)	20.4	20.4		11.9	23.9		26.7	26.7		28.5	28.5	28.5
Total Split (s)	48.1	48.1		11.9	60.0		30.0	30.0		30.0	30.0	30.0
Total Split (%)	53.4%	53.4%		13.2%	66.7%		33.3%	33.3%		33.3%	33.3%	33.3%
Maximum Green (s)	42.7	42.7		7.0	55.1		24.3	24.3		24.5	24.5	24.5
Yellow Time (s)	3.5	3.5		3.0	3.1		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	1.9	1.9		1.9	1.8		2.4	2.4		2.2	2.2	2.2
Lost Time Adjust (s)		-0.4			0.1			-0.7			-0.5	-0.5
Total Lost Time (s)		5.0			5.0			5.0			5.0	5.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		1.0	2.0		1.0	1.0		1.0	1.0	1.0
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	8.0	8.0			12.0		14.0	14.0		16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)		79.3			79.3			6.6			7.7	7.7
Actuated g/C Ratio		0.88			0.88			0.07			0.09	0.09
v/c Ratio		0.21			0.16			0.32			0.15	0.08
Control Delay		1.6			0.7			39.6			40.8	0.8
Queue Delay		0.0			0.0			0.0			0.0	0.0

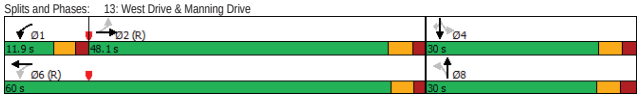
UNC DP TIA 2023 — No-Build (2030) AM
13: West Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		1.6			0.7			39.6			40.8	0.8
LOS		A			A			D			D	A
Approach Delay		1.6			0.7			39.6			21.3	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)		25			2			16			10	0
Queue Length 95th (ft)		40			12			46			32	0
Internal Link Dist (ft)		308			254			269			213	
Turn Bay Length (ft)												
Base Capacity (vph)		2656			2024			424			419	504
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.21			0.16			0.09			0.05	0.04

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 76 (84%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.32
Intersection Signal Delay: 3.5 — Intersection LOS: A
Intersection Capacity Utilization 53.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 13: West Drive & Manning Drive



UNC DP TIA 2023 — No-Build (2030) AM
14: East Drive/Hospital Entrance & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	287	142	216	209	55	49	22	201	0	0	0
Future Volume (vph)	68	287	142	216	209	55	49	22	201	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		-4%			3%			-4%			0%	
Storage Length (ft)	150		0	100		0	100		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.92	0.93		0.91	0.97				0.89			
Frt		0.950			0.969				0.850			
Flt Protected	0.950			0.950				0.967				
Satd. Flow (prot)	1685	2965	0	1627	3064	0	0	1715	1507	0	0	0
Flt Permitted	0.573			0.473				0.967				
Satd. Flow (perm)	932	2965	0	737	3064	0	0	1715	1339	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		100			48				144			
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		382			469			315			391	
Travel Time (s)		7.4			9.1			8.6			10.7	
Confl. Peds. (#/hr)	88		85	85		88			83	83		
Confl. Bikes (#/hr)			6			1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	319	158	240	232	61	54	24	223	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	477	0	240	293	0	0	78	223	0	0	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov			
Protected Phases	5	2		1	6			8	1			
Permitted Phases	6			2			8		8			
Detector Phase	5	2		1	6		8	8	1			
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		7.0	7.0	5.0			
Minimum Split (s)	12.4	25.0		12.4	24.6		27.8	27.8	12.4			
Total Split (s)	14.0	34.0		26.0	46.0		30.0	30.0	26.0			
Total Split (%)	15.6%	37.8%		28.9%	51.1%		33.3%	33.3%	28.9%			
Maximum Green (s)	8.9	28.0		20.6	40.4		24.2	24.2	20.6			
Yellow Time (s)	3.0	3.4		3.0	3.1		3.4	3.4	3.0			
All-Red Time (s)	2.1	2.6		2.4	2.5		2.4	2.4	2.4			
Lost Time Adjust (s)	-0.4	-0.9		-0.4	-0.6			-1.2	-0.4			
Total Lost Time (s)	4.7	5.1		5.0	5.0			4.6	5.0			
Lead/Lag	Lead	Lag		Lead	Lag				Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	1.0	1.0			
Recall Mode	None	C-Min		None	C-Min		None	None	None			
Walk Time (s)		7.0			7.0		7.0	7.0				
Flash Dont Walk (s)		12.0			12.0		15.0	15.0				
Pedestrian Calls (#/hr)		0			0		0	0				
Act Effct Green (s)	69.9	55.1		68.4	66.2			9.6	20.8			

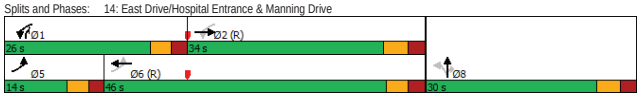
UNC DP TIA 2023 — No-Build (2030) AM
14: East Drive/Hospital Entrance & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.78	0.61		0.76	0.74			0.11	0.23			
v/c Ratio	0.10	0.26		0.35	0.13			0.43	0.50			
Control Delay	2.2	6.1		4.1	1.7			44.6	12.3			
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0			
Total Delay	2.2	6.1		4.1	1.7			44.6	12.3			
LOS	A	A		A	A			D	B			
Approach Delay		5.5			2.8			20.7				
Approach LOS		A			A			C				
Queue Length 50th (ft)	5	32		15	0			43	33			
Queue Length 95th (ft)	14	74		21	8			83	76			
Internal Link Dist (ft)		302			389			235			311	
Turn Bay Length (ft)	150			100								
Base Capacity (vph)	833	1854		802	2265			484	563			
Starvation Cap Reductn	0	0		0	0			0	0			
Spillback Cap Reductn	0	0		0	0			0	0			
Storage Cap Reductn	0	0		0	0			0	0			
Reduced v/c Ratio	0.09	0.26		0.30	0.13			0.16	0.40			

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 76 (84%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.50
Intersection Signal Delay: 7.8 — Intersection LOS: A
Intersection Capacity Utilization 57.6% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 14: East Drive/Hospital Entrance & Manning Drive



UNC DP TIA 2023 — No-Build (2030) AM
15: Skipper Bowles Drive/Ridge Road & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	229	57	8	490	69	9	40	5	33	147	304
Future Volume (vph)	81	229	57	8	490	69	9	40	5	33	147	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	10	11	12	10	12	12	12	12	12
Grade (%)		-2%			6%			12%			2%	
Storage Length (ft)	100		0	100		0	0		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93	0.97		0.92	0.98		0.87	0.98		0.89		0.82
Frt		0.970			0.981			0.982				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	3260	0	1602	3184	0	1553	1692	0	1752	1844	1567
Flt Permitted	0.950			0.950			0.654			0.724		
Satd. Flow (perm)	1556	3260	0	1470	3184	0	926	1692	0	1184	1844	1284
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			16			6				163
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		348			791			579			293	
Travel Time (s)		9.5			21.6			15.8			8.0	
Confl. Peds. (#/hr)	99		124	124		99	155		113	113		155
Confl. Bikes (#/hr)			1						1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	90	254	63	9	544	77	10	44	6	37	163	338
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	317	0	9	621	0	10	50	0	37	163	338
Turn Type	Prot	NA		Prot	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases							4			8		4
Detector Phase	5	2		1	6		3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		4.0	7.0		7.0	7.0	7.0
Minimum Split (s)	12.9	35.2		12.8	37.0		8.0	34.3		13.0	33.0	12.9
Total Split (s)	15.0	39.9		12.8	37.7		8.0	34.3		13.0	39.3	15.0
Total Split (%)	15.0%	39.9%		12.8%	37.7%		8.0%	34.3%		13.0%	39.3%	15.0%
Maximum Green (s)	9.4	33.7		7.4	31.7		4.0	28.0		7.0	33.3	9.4
Yellow Time (s)	3.0	3.3		3.0	3.0		3.5	3.0		3.0	3.1	3.0
All-Red Time (s)	2.6	2.9		2.4	3.0		0.5	3.3		3.0	2.9	2.6
Lost Time Adjust (s)	-0.9	-1.3		-0.8	-1.1		-1.2	-1.2		-0.9	-0.9	-0.9
Total Lost Time (s)	4.7	4.9		4.6	4.9		2.8	5.1		5.1	5.1	4.7
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	2.0	3.0		2.0	2.0		3.0	2.0		2.0	2.0	2.0
Recall Mode	None	Min		None	Min		None	None		None	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			24.0			21.0			20.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	9.2	29.7		8.1	17.4		15.8	9.6		12.2	12.6	22.3

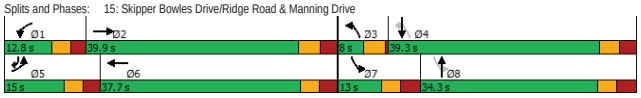
UNC DP TIA 2023 — No-Build (2030) AM
15: Skipper Bowles Drive/Ridge Road & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.16	0.53		0.15	0.31		0.28	0.17		0.22	0.23	0.40
v/c Ratio	0.33	0.18		0.04	0.62		0.03	0.17		0.11	0.39	0.51
Control Delay	28.1	8.7		27.5	20.0		15.1	23.8		17.4	23.0	9.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	28.1	8.7		27.5	20.0		15.1	23.8		17.4	23.0	9.1
LOS	C	A		C	C		B	C		B	C	A
Approach Delay		13.0			20.1			22.4			13.9	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	24	16		2	76		2	11		9	43	29
Queue Length 95th (ft)	80	74		17	170		12	47		31	118	111
Internal Link Dist (ft)		268			711			499			213	
Turn Bay Length (ft)	100			100								100
Base Capacity (vph)	321	2147		245	1960		323	927		342	1180	695
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.28	0.15		0.04	0.32		0.03	0.05		0.11	0.14	0.49

Intersection Summary

Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 55.8			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 16.4		Intersection LOS: B	
Intersection Capacity Utilization 66.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 15: Skipper Bowles Drive/Ridge Road & Manning Drive



UNC DP TIA 2023 — No-Build (2030) AM
16: Columbia Street & Westwood Drive/Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	6	115	2	64	8	605	472	133	232	3
Future Volume (vph)	2	1	6	115	2	64	8	605	472	133	232	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-1%			-3%			-3%			4%	
Storage Length (ft)	0		0	0		250	150		200	0		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95			0.96	0.93	0.91		0.95		1.00	
Frt		0.905				0.850			0.850		0.998	
Flt Protected		0.990			0.953		0.950			0.950		
Satd. Flow (prot)	0	1599	0	0	1742	1554	1796	1891	1714	1676	1757	0
Flt Permitted		0.990			0.953		0.598			0.180		
Satd. Flow (perm)	0	1586	0	0	1665	1448	1029	1891	1629	318	1757	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				80			496		1	
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		283			749			309			956	
Travel Time (s)		6.4			20.4			8.4			26.1	
Confl. Peds. (#/hr)	21		16	16		21	32		10	10		32
Confl. Bikes (#/hr)			1						12			5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	1	7	128	2	71	9	672	524	148	258	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	130	71	9	672	524	148	261	0
Turn Type	Split	NA		Split	NA	pm+ov	D.Pm	NA	pm+ov	D.P+P	NA	
Protected Phases	4	4		3	3	1		2	3	1	6	
Permitted Phases						3	6		2	2		
Detector Phase	4	4		3	3	1	6	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	10.0	10.0	7.0	7.0	10.0	
Minimum Split (s)	28.3	28.3		33.4	33.4	11.9	16.9	30.9	33.4	11.9	16.9	
Total Split (s)	28.3	28.3		33.4	33.4	12.6	63.3	50.7	33.4	12.6	63.3	
Total Split (%)	22.6%	22.6%		26.7%	26.7%	10.1%	50.6%	40.6%	26.7%	10.1%	50.6%	
Maximum Green (s)	22.0	22.0		27.0	27.0	7.7	57.4	44.8	27.0	7.7	57.4	
Yellow Time (s)	3.3	3.3		3.5	3.5	3.1	3.6	3.6	3.5	3.1	3.6	
All-Red Time (s)	3.0	3.0		2.9	2.9	1.8	2.3	2.3	2.9	1.8	2.3	
Lost Time Adjust (s)		-1.3			-1.4	0.1	-0.9	-0.9	-1.4	0.1	-0.9	
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead		Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min	None	None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Flash Dont Walk (s)	18.0	18.0		23.0	23.0		7.0	21.0	23.0		7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	
Act Effct Green (s)		8.6			12.4	20.2	50.0	37.0	49.4	44.8	50.0	

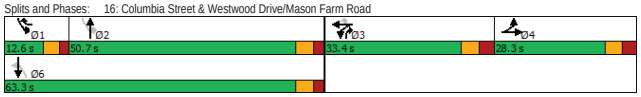
UNC DP TIA 2023 — No-Build (2030) AM
16: Columbia Street & Westwood Drive/Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.12			0.17	0.27	0.67	0.50	0.66	0.60	0.67	
v/c Ratio		0.05			0.45	0.15	0.01	0.72	0.42	0.44	0.22	
Control Delay		26.2			35.8	4.6	6.5	21.3	1.6	10.6	6.6	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		26.2			35.8	4.6	6.5	21.3	1.6	10.6	6.6	
LOS		C			D	A	A	C	A	B	A	
Approach Delay		26.2			24.8			12.7			8.0	
Approach LOS		C			C			B			A	
Queue Length 50th (ft)		1			52	0	1	205	2	18	33	
Queue Length 95th (ft)		18			131	21	9	502	35	70	119	
Internal Link Dist (ft)		203			669			229			876	
Turn Bay Length (ft)						250	150		200			
Base Capacity (vph)		518			683	461	828	1193	1523	333	1414	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.02			0.19	0.15	0.01	0.56	0.34	0.44	0.18	

Intersection Summary

Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 74.7			
Natural Cycle: 125			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 13.0		Intersection LOS: B	
Intersection Capacity Utilization 69.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 16: Columbia Street & Westwood Drive/Mason Farm Road



UNC DP TIA 2023 — No-Build (2030) AM
17: West Drive & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	325	11	5	137	39	0	0	0	31	6	20
Future Volume (vph)	148	325	11	5	137	39	0	0	0	31	6	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			4%			0%			1%	
Storage Length (ft)	0		125	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96	0.65		0.95						0.90	
Frt			0.850		0.971						0.953	
Flt Protected		0.985			0.999						0.974	
Satd. Flow (prot)	0	1862	1607	0	1691	0	0	0	0	0	1668	0
Flt Permitted		0.838			0.987						0.974	
Satd. Flow (perm)	0	1515	1044	0	1665	0	0	0	0	0	1545	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			41		32						22	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		344			481			500			293	
Travel Time (s)		9.4			13.1			11.4			8.0	
Confl. Peds. (#/hr)	87		125	125		87	39		75	78		39
Confl. Bikes (#/hr)			2			8						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	164	361	12	6	152	43	0	0	0	34	7	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	525	12	0	201	0	0	0	0	0	63	0
Turn Type	Perm	NA	Perm	Perm	NA					Perm	NA	
Protected Phases		2			6						4	
Permitted Phases	2		2	6						4		
Detector Phase	2	2	2	6	6					4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0					7.0	7.0	
Minimum Split (s)	23.0	23.0	23.0	23.8	23.8					25.6	25.6	
Total Split (s)	44.4	44.4	44.4	44.4	44.4					25.6	25.6	
Total Split (%)	63.4%	63.4%	63.4%	63.4%	63.4%					36.6%	36.6%	
Maximum Green (s)	39.4	39.4	39.4	38.6	38.6					20.0	20.0	
Yellow Time (s)	3.5	3.5	3.5	3.0	3.0					3.2	3.2	
All-Red Time (s)	1.5	1.5	1.5	2.8	2.8					2.4	2.4	
Lost Time Adjust (s)		0.0	0.0		-0.9						-0.2	
Total Lost Time (s)		5.0	5.0		4.9						5.4	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0					2.0	2.0	
Recall Mode	Min	Min	Min	Min	Min					None	None	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0					7.0	7.0	
Flash Dont Walk (s)	6.0	6.0	6.0	9.0	9.0					13.0	13.0	
Pedestrian Calls (#/hr)	0	0	0	0	0					0	0	
Act Effct Green (s)		32.1	32.1		32.1						7.9	
Actuated g/C Ratio		0.78	0.78		0.78						0.19	

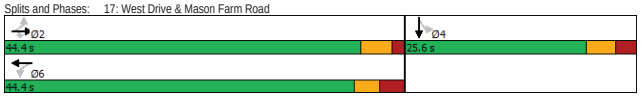
UNC DP TIA 2023 — No-Build (2030) AM
17: West Drive & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.45	0.01		0.15						0.20	
Control Delay		5.9	0.5		3.3						14.7	
Queue Delay		0.0	0.0		0.0						0.0	
Total Delay		5.9	0.5		3.3						14.7	
LOS		A	A		A						B	
Approach Delay		5.8			3.3						14.7	
Approach LOS		A			A						B	
Queue Length 50th (ft)		65	0		15						10	
Queue Length 95th (ft)		143	1		38						35	
Internal Link Dist (ft)		264			401			420			213	
Turn Bay Length (ft)			125									
Base Capacity (vph)		1344	931		1483						801	
Starvation Cap Reductn		0	0		0						0	
Spillback Cap Reductn		0	0		0						0	
Storage Cap Reductn		0	0		0						0	
Reduced v/c Ratio		0.39	0.01		0.14						0.08	

Intersection Summary

Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 41.4			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 5.9		Intersection LOS: A	
Intersection Capacity Utilization 66.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 17: West Drive & Mason Farm Road



UNC DP TIA 2023 — No-Build (2030) AM
18: Mason Farm Road & East Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	227	63	10	82	25	70	30	60	0	0	0
Future Volume (vph)	99	227	63	10	82	25	70	30	60	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	50		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90	0.95		0.88	0.97			0.94				
Frt		0.967			0.965			0.949				
Flt Protected	0.950			0.950				0.979				
Satd. Flow (prot)	1770	1702	0	1770	1745	0	0	1624	0	0	0	0
Flt Permitted	0.607			0.566				0.979				
Satd. Flow (perm)	1021	1702	0	924	1745	0	0	1588	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			19			33				
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		481			155			560			76	
Travel Time (s)		13.1			4.2			15.3			1.7	
Confl. Peds. (#/hr)	63		133	133		63	23		30	30		23
Confl. Bikes (#/hr)			2						9			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	110	252	70	11	91	28	78	33	67	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	110	322	0	11	119	0	0	178	0	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA				
Protected Phases	5	2		1	6		8	8				
Permitted Phases	2			6								
Detector Phase	5	2		1	6		8	8				
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0				
Minimum Split (s)	29.1	29.3		29.8	19.3		24.3	24.3				
Total Split (s)	29.1	30.9		29.8	31.6		24.3	24.3				
Total Split (%)	34.2%	36.4%		35.1%	37.2%		28.6%	28.6%				
Maximum Green (s)	25.0	25.6		25.0	26.3		19.0	19.0				
Yellow Time (s)	3.0	3.2		3.0	3.2		3.0	3.0				
All-Red Time (s)	1.1	2.1		1.8	2.1		2.3	2.3				
Lost Time Adjust (s)	0.9	-0.2		0.4	-0.2			-0.4				
Total Lost Time (s)	5.0	5.1		5.2	5.1			4.9				
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	1.0				
Recall Mode	None	Min		None	Min		None	None				
Walk Time (s)	5.0	7.0		5.0	7.0		7.0	7.0				
Flash Dont Walk (s)	20.0	17.0		20.0	7.0		12.0	12.0				
Pedestrian Calls (#/hr)	0	0		0	0		0	0				
Act Effct Green (s)	21.5	21.8		19.6	17.5			9.0				
Actuated g/C Ratio	0.56	0.56		0.51	0.45			0.23				

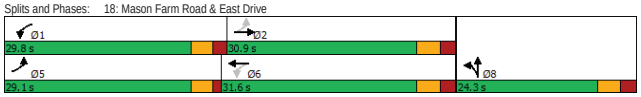
UNC DP TIA 2023 — No-Build (2030) AM
18: Mason Farm Road & East Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.16	0.33		0.02	0.15			0.44				
Control Delay	5.6	9.0		5.0	10.4			16.4				
Queue Delay	0.0	0.0		0.0	0.0			0.0				
Total Delay	5.6	9.0		5.0	10.4			16.4				
LOS	A	A		A	B			B				
Approach Delay		8.1			9.9			16.4				
Approach LOS		A			A			B				
Queue Length 50th (ft)	9	30		1	17			28				
Queue Length 95th (ft)	31	139		6	50			89				
Internal Link Dist (ft)		401			75			480			1	
Turn Bay Length (ft)	50			100								
Base Capacity (vph)	1216	1215		1230	1279			883				
Starvation Cap Reductn	0	0		0	0			0				
Spillback Cap Reductn	0	0		0	0			0				
Storage Cap Reductn	0	0		0	0			0				
Reduced v/c Ratio	0.09	0.27		0.01	0.09			0.20				

Intersection Summary

Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 38.6			
Natural Cycle: 85			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 10.4		Intersection LOS: B	
Intersection Capacity Utilization 45.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 18: Mason Farm Road & East Drive



UNC DP TIA 2023 — No-Build (2030) AM
19: Mason Farm Road & Purefoy Road — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	141	34	11	182	49	10
Future Volume (vph)	141	34	11	182	49	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.974				0.977	
Flt Protected	0.961			0.997		
Satd. Flow (prot)	1744	0	0	1857	1820	0
Flt Permitted	0.961			0.997		
Satd. Flow (perm)	1744	0	0	1857	1820	0
Link Speed (mph)	25			30	30	
Link Distance (ft)	563			318	480	
Travel Time (s)	15.4			7.2	10.9	
Confl. Peds. (#/hr)	5	42	21			5
Confl. Bikes (#/hr)		13				9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	157	38	12	202	54	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	195	0	0	214	65	0
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.2%		ICU Level of Service A	
Analysis Period (min) 15			

UNC DP TIA 2023 — No-Build (2030) AM
19: Mason Farm Road & Purefoy Road — HCM 2010 AWSC

Intersection

Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	141	34	11	182	49	10
Future Vol, veh/h	141	34	11	182	49	10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	157	38	12	202	54	11
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.2	9.2	8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	6%	81%	0%
Vol Thru, %	94%	0%	83%
Vol Right, %	0%	19%	17%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	193	175	59
LT Vol	11	141	0
Through Vol	182	0	49
RT Vol	0	34	10
Lane Flow Rate	214	194	66
Geometry Grp	1	1	1
Degree of Util (X)	0.268	0.25	0.083
Departure Headway (Hd)	4.495	4.623	4.548
Convergence, Y/N	Yes	Yes	Yes
Cap	800	778	787
Service Time	2.517	2.649	2.577
HCM Lane V/C Ratio	0.268	0.249	0.084
HCM Control Delay	9.2	9.2	8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.1	1	0.3

UNC DP TIA 2023 — No-Build (2030) AM
20: Skipper Bowles Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	309	18	285	619	1	22
Future Volume (vph)	309	18	285	619	1	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.992					0.850
Flt Protected				0.984	0.950	
Satd. Flow (prot)	3511	0	0	3483	1770	1583
Flt Permitted				0.984	0.950	
Satd. Flow (perm)	3511	0	0	3483	1770	1583
Link Speed (mph)	35			35	35	
Link Distance (ft)	336			902	340	
Travel Time (s)	6.5			17.6	6.6	
Confl. Peds. (#/hr)		7	7			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	343	20	317	688	1	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	363	0	0	1005	1	24
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.7%		ICU Level of Service A	
Analysis Period (min) 15			

UNC DP TIA 2023 — No-Build (2030) AM
20: Skipper Bowles Drive & Manning Drive — HCM 2010 TWSC

Intersection

Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	309	18	285	619	1	22
Future Vol, veh/h	309	18	285	619	1	22
Conflicting Peds, #/hr	0	7	7	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	343	20	317	688	1	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	370	0	1338	189
Stage 1	-	-	-	-	360	-
Stage 2	-	-	-	-	978	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1185	-	144	821
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	325	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1178	-	81	816
Mov Cap-2 Maneuver	-	-	-	-	81	-
Stage 1	-	-	-	-	673	-
Stage 2	-	-	-	-	183	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	81	816	-	-	1178	-
HCM Lane V/C Ratio	0.014	0.03	-	-	0.269	-
HCM Control Delay (s)	50.1	9.5	-	-	9.2	1
HCM Lane LOS	F	A	-	-	A	A
HCM 95th %tile Q(veh)	0	0.1	-	-	1.1	-

UNC DP TIA 2023 — No-Build (2030) AM
21: Columbia Street & Purefoy Road — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	32	5	1050	150	3	372
Future Volume (vph)	32	5	1050	150	3	372
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	250	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.981		0.983			
Flt Protected	0.959				0.950	
Satd. Flow (prot)	1752	0	1831	0	1770	1863
Flt Permitted	0.959				0.950	
Satd. Flow (perm)	1752	0	1831	0	1770	1863
Link Speed (mph)	25		25			25
Link Distance (ft)	654		109			397
Travel Time (s)	17.8		3.0			10.8
Confl. Peds. (#/hr)	8			3	3	
Confl. Bikes (#/hr)		2		3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	36	6	1167	167	3	413
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	0	1334	0	3	413
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 74.4% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
21: Columbia Street & Purefoy Road — HCM 2010 TWSC

Intersection

Int Delay, s/veh 1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	5	1050	150	3	372
Future Vol, veh/h	32	5	1050	150	3	372
Conflicting Peds, #/hr	8	0	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	6	1167	167	3	413

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1681	1254	0	0	1337	0
Stage 1	1254	-	-	-	-	-
Stage 2	427	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	104	210	-	-	516	-
Stage 1	269	-	-	-	-	-
Stage 2	658	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	102	209	-	-	515	-
Mov Cap-2 Maneuver	102	-	-	-	-	-
Stage 1	268	-	-	-	-	-
Stage 2	649	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	56.1	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	110	515	-
HCM Lane V/C Ratio	-	-	0.374	0.006	-
HCM Control Delay (s)	-	-	56.1	12	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	1.5	0	-

UNC DP TIA 2023 — No-Build (2030) AM
22: Columbia Street & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	567	3	68	179	1148	0	0	282	91
Future Volume (vph)	0	0	0	567	3	68	179	1148	0	0	282	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			2%			-2%	
Storage Length (ft)	0		0	600		600	250		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor				0.99	0.99		1.00					0.98
Frt						0.850						0.850
Flt Protected				0.950	0.953		0.950					
Satd. Flow (prot)	0	0	0	1656	1661	1560	1752	3504	0	0	3575	1599
Flt Permitted				0.950	0.953		0.559					
Satd. Flow (perm)	0	0	0	1640	1646	1560	1027	3504	0	0	3575	1564
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						67						101
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1226			1188			609			378	
Travel Time (s)		33.4			32.4			16.6			10.3	
Confl. Peds. (#/hr)			5	5			2		7	7		2
Confl. Bikes (#/hr)									5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	630	3	76	199	1276	0	0	313	101
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	315	318	76	199	1276	0	0	313	101
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	7.0	10.0			10.0	10.0
Minimum Split (s)				29.8	29.8	29.8	13.8	28.1			16.1	16.1
Total Split (s)				59.0	59.0	59.0	20.0	91.0			71.0	71.0
Total Split (%)				39.3%	39.3%	39.3%	13.3%	60.7%			47.3%	47.3%
Maximum Green (s)				53.2	53.2	53.2	14.2	84.9			64.9	64.9
Yellow Time (s)				3.7	3.7	3.7	3.0	4.0			4.0	4.0
All-Red Time (s)				2.1	2.1	2.1	2.8	2.1			2.1	2.1
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				5.8	5.8	5.8	5.8	6.1			6.1	6.1
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				1.0	1.0	1.0	1.0	3.0			3.0	3.0
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0		7.0				
Flash Dont Walk (s)				17.0	17.0	17.0		15.0				
Pedestrian Calls (#/hr)				0	0	0		0				
Act Effct Green (s)				33.4	33.4	33.4	105.0	104.7			84.7	84.7
Actuated g/C Ratio				0.22	0.22	0.22	0.70	0.70			0.56	0.56

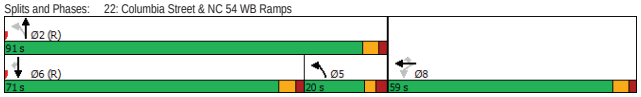
UNC DP TIA 2023 — No-Build (2030) AM
22: Columbia Street & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio				0.87	0.87	0.19	0.25	0.52			0.16	0.11
Control Delay				78.1	78.8	12.3	4.2	5.3			16.9	3.6
Queue Delay				0.0	0.0	0.0	0.0	0.2			0.0	0.0
Total Delay				78.1	78.8	12.3	4.2	5.5			16.9	3.6
LOS				E	E	B	A	A			B	A
Approach Delay					71.4			5.3			13.7	
Approach LOS					E			A			B	
Queue Length 50th (ft)				314	317	7	38	160			74	0
Queue Length 95th (ft)				403	408	47	44	327			117	32
Internal Link Dist (ft)		1146			1108			529			298	
Turn Bay Length (ft)				600		600	250					
Base Capacity (vph)				581	583	596	787	2446			2019	927
Starvation Cap Reductn				0	0	0	0	381			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.54	0.55	0.13	0.25	0.62			0.16	0.11

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 13 (9%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 24.7 — Intersection LOS: C
Intersection Capacity Utilization 57.4% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 22: Columbia Street & NC 54 WB Ramps



UNC DP TIA 2023 — No-Build (2030) AM
23: Columbia Street & NC 54 EB Ramps/Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	346	3	344	0	0	0	0	909	0	63	826	0
Future Volume (vph)	346	3	344	0	0	0	0	909	0	63	826	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			0%			3%			-6%	
Storage Length (ft)	250		250	0		0	0		0	250		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99									
Frt			0.850									
Flt Protected	0.950	0.953								0.950		
Satd. Flow (prot)	1664	1670	1567	0	0	0	0	3486	0	1823	3645	0
Flt Permitted	0.950	0.953								0.216		
Satd. Flow (perm)	1664	1670	1546	0	0	0	0	3486	0	414	3645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			117									
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		975			270			219			609	
Travel Time (s)		22.2			6.1			6.0			16.6	
Confl. Peds. (#/hr)							9					9
Confl. Bikes (#/hr)			3						4			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	384	3	382	0	0	0	0	1010	0	70	918	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	192	195	382	0	0	0	0	1010	0	70	918	0
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	13.2	13.2	13.2					16.0		12.5	27.0	
Total Split (s)	61.0	61.0	61.0					75.0		14.0	89.0	
Total Split (%)	40.7%	40.7%	40.7%					50.0%		9.3%	59.3%	
Maximum Green (s)	54.8	54.8	54.8					69.0		8.5	83.0	
Yellow Time (s)	3.1	3.1	3.1					4.3		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.7		2.4	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2	6.2					6.0		5.5	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	2.0	2.0	2.0					3.0		1.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Walk Time (s)											7.0	
Flash Dont Walk (s)											14.0	
Pedestrian Calls (#/hr)											0	
Act Effct Green (s)	33.9	33.9	33.9					93.7		104.4	103.9	
Actuated g/C Ratio	0.23	0.23	0.23					0.62		0.70	0.69	

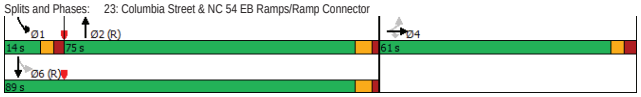
UNC DP TIA 2023 — No-Build (2030) AM
23: Columbia Street & NC 54 EB Ramps/Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.51	0.52	0.87					0.46		0.20	0.36	
Control Delay	53.7	53.9	57.3					5.9		4.2	3.3	
Queue Delay	0.0	0.0	0.0					0.0		0.0	0.3	
Total Delay	53.7	53.9	57.3					5.9		4.2	3.6	
LOS	D	D	E					A		A	A	
Approach Delay		55.5						5.9			3.6	
Approach LOS		E						A			A	
Queue Length 50th (ft)	174	177	263					87		7	48	
Queue Length 95th (ft)	230	233	352					m147		13	58	
Internal Link Dist (ft)		895			190			139			529	
Turn Bay Length (ft)	250		250							250		
Base Capacity (vph)	607	610	639					2177		367	2523	
Starvation Cap Reductn	0	0	0					0		0	896	
Spillback Cap Reductn	0	0	0					0		0	0	
Storage Cap Reductn	0	0	0					0		0	0	
Reduced v/c Ratio	0.32	0.32	0.60					0.46		0.19	0.56	

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 136 (91%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 18.9 — Intersection LOS: B
Intersection Capacity Utilization 57.4% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Columbia Street & NC 54 EB Ramps/Ramp Connector



No-Build (2030) AM.syn VHB

UNC DP TIA 2023 — No-Build (2030) AM
24: Fordham Blvd & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2543	1384	95	0	26
Future Volume (vph)	0	2543	1384	95	0	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.990			0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3504	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	3504	0	0	1611
Link Speed (mph)		45	45		30	
Link Distance (ft)		1661	919		168	
Travel Time (s)		25.2	13.9		3.8	
Confl. Bikes (#/hr)				1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2826	1538	106	0	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2826	1644	0	0	29
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 73.6% — ICU Level of Service D
Analysis Period (min) 15

No-Build (2030) AM.syn VHB

UNC DP TIA 2023 — No-Build (2030) AM
24: Fordham Blvd & Mason Farm Road HCM 2010 TWSC

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2543	1384	95	0	26
Future Vol, veh/h	0	2543	1384	95	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2826	1538	106	0	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	822
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	317
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	317
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17.5
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	317
HCM Lane V/C Ratio	-	-	-	0.091
HCM Control Delay (s)	-	-	-	17.5
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.3

No-Build (2030) AM.syn VHB

UNC DP TIA 2023 — No-Build (2030) AM
25: Manning Drive & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	2256	4	10	1400	779	18	5	38	182	2	45
Future Volume (vph)	198	2256	4	10	1400	779	18	5	38	182	2	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			0%			0%			-4%	
Storage Length (ft)	350		0	150		900	0		75	500		400
Storage Lanes	2		0	1		1	0		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor		1.00		1.00				0.99	0.99			0.98
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950				0.963		0.950		
Satd. Flow (prot)	3519	3628	0	1770	3539	1583	0	1794	1583	3502	1900	1615
Flt Permitted	0.950			0.950				0.963		0.950		
Satd. Flow (perm)	3519	3628	0	1768	3539	1583	0	1778	1560	3502	1900	1577
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						410			95			133
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		455			1093			556			574	
Travel Time (s)		6.9			16.6			15.2			11.2	
Confl. Peds. (#/hr)			2	2			5					5
Confl. Bikes (#/hr)									1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	220	2507	4	11	1556	866	20	6	42	202	2	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	2511	0	11	1556	866	0	26	42	202	2	50
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6	4	3	3	1	4	4	
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	1	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.2	18.1		13.2	18.3	29.2	13.2	13.2	13.2	29.2	29.2	29.2
Total Split (s)	22.4	123.2		13.2	114.0	30.4	13.2	13.2	13.2	30.4	30.4	30.4
Total Split (%)	12.4%	68.4%		7.3%	63.3%	16.9%	7.3%	7.3%	7.3%	16.9%	16.9%	16.9%
Maximum Green (s)	16.2	117.1		7.0	107.7	24.2	7.0	7.0	7.0	24.2	24.2	24.2
Yellow Time (s)	3.0	4.7		3.0	4.5	3.8	3.8	3.8	3.0	3.8	3.8	3.8
All-Red Time (s)	3.2	1.4		3.2	1.8	2.4	2.4	2.4	3.2	2.4	2.4	2.4
Lost Time Adjust (s)	-1.2	-1.1		-1.2	-1.3	-1.2		-1.2	-1.2	-1.2	-1.2	-1.2
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			
Vehicle Extension (s)	1.0	6.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	3.0		1.0	3.0	3.0	2.0	2.0	1.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	20.0		0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	60.0		0.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min		None	Min	None	None	None	None	None	None	None
Walk Time (s)						7.0				7.0	7.0	7.0
Flash Dont Walk (s)						16.0				16.0	16.0	16.0

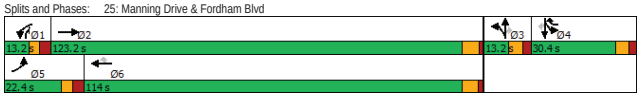
UNC DP TIA 2023 — No-Build (2030) AM
25: Manning Drive & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)						0				0	0	0
Act Effct Green (s)	14.3	119.4		8.3	110.2	128.8		8.3	12.9	16.3	16.3	16.3
Actuated g/C Ratio	0.09	0.73		0.05	0.67	0.79		0.05	0.08	0.10	0.10	0.10
v/c Ratio	0.71	0.95		0.12	0.65	0.65		0.29	0.20	0.58	0.01	0.18
Control Delay	87.5	31.3		83.6	19.3	4.9		88.7	2.1	77.9	67.5	1.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	31.3		83.6	19.3	4.9		88.7	2.1	77.9	67.5	1.4
LOS	F	C		F	B	A		F	A	E	E	A
Approach Delay		35.8			14.5			35.2			62.7	
Approach LOS		D			B			D			E	
Queue Length 50th (ft)	125	~1391		12	544	97		29	0	113	2	0
Queue Length 95th (ft)	181	#1802		38	743	174		69	0	159	11	0
Internal Link Dist (ft)		375			1013			476			494	
Turn Bay Length (ft)	350			150		900			75	500		400
Base Capacity (vph)	378	2651		89	2416	1401		90	211	549	298	359
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.58	0.95		0.12	0.64	0.62		0.29	0.20	0.37	0.01	0.14

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 163.4
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 27.6 — Intersection LOS: C
Intersection Capacity Utilization 93.8% — ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 25: Manning Drive & Fordham Blvd



UNC DP TIA 2023 — No-Build (2030) AM
26: Oteys Road & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	21	11	2	100	19	36	1	1	3	3	22
Future Volume (vph)	48	21	11	2	100	19	36	1	1	3	3	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	10	10	12	10	12	10	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.982			0.979			0.997			0.892	
Flt Protected		0.971			0.999			0.955			0.995	
Satd. Flow (prot)	0	1658	0	0	1700	0	0	1774	0	0	1653	0
Flt Permitted		0.971			0.999			0.955			0.995	
Satd. Flow (perm)	0	1658	0	0	1700	0	0	1774	0	0	1653	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1056			735			360			503	
Travel Time (s)		28.8			20.0			9.8			13.7	
Confl. Peds. (#/hr)	22		1	1		22			3	3		
Confl. Bikes (#/hr)			1			4						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	53	23	12	2	111	21	40	1	1	3	3	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	88	0	0	134	0	0	42	0	0	30	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 27.1% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
26: Oteys Road & Mason Farm Road — HCM 2010 AWSC

Intersection

Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	21	11	2	100	19	36	1	1	3	3	22
Future Vol, veh/h	48	21	11	2	100	19	36	1	1	3	3	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	53	23	12	2	111	21	40	1	1	3	3	24
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	7.8	7.9	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	95%	60%	2%	11%
Vol Thru, %	3%	26%	83%	11%
Vol Right, %	3%	14%	16%	79%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	38	80	121	28
LT Vol	36	48	2	3
Through Vol	1	21	100	3
RT Vol	1	11	19	22
Lane Flow Rate	42	89	134	31
Geometry Grp	1	1	1	1
Degree of Util (X)	0.054	0.104	0.151	0.035
Departure Headway (Hd)	4.63	4.204	4.04	4.022
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	778	843	878	895
Service Time	2.631	2.277	2.107	2.023
HCM Lane V/C Ratio	0.054	0.106	0.153	0.035
HCM Control Delay	7.9	7.8	7.8	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.5	0.1

UNC DP TIA 2023 — No-Build (2030) AM
27: Boundary Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	300	13	57	623	74	3	19	18	43	20	8
Future Volume (vph)	11	300	13	57	623	74	3	19	18	43	20	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	12	11	11	12
Grade (%)		-3%			1%			2%			-1%	
Storage Length (ft)	0		0	0		0	50		0	75		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.99	0.99		1.00	0.99	
Frt		0.994			0.985			0.927			0.956	
Flt Protected		0.998			0.996		0.950			0.950		
Satd. Flow (prot)	0	3564	0	0	3444	0	1694	1642	0	1754	1750	0
Flt Permitted		0.929			0.900		0.769			0.769		
Satd. Flow (perm)	0	3317	0	0	3112	0	1351	1642	0	1418	1750	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			27			20			9	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1100			226			551			371	
Travel Time (s)		30.0			6.2			15.0			10.1	
Confl. Peds. (#/hr)	7					7	17		1	1		17
Confl. Bikes (#/hr)						6			1			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	12	333	14	63	692	82	3	21	20	48	22	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	359	0	0	837	0	3	41	0	48	31	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.4	15.4		15.6	15.6		12.6	12.6		24.7	24.7	
Total Split (s)	30.0	30.0		30.0	30.0		25.0	25.0		25.0	25.0	
Total Split (%)	54.5%	54.5%		54.5%	54.5%		45.5%	45.5%		45.5%	45.5%	
Maximum Green (s)	24.6	24.6		24.4	24.4		19.4	19.4		19.3	19.3	
Yellow Time (s)	3.7	3.7		3.5	3.5		3.7	3.7		3.9	3.9	
All-Red Time (s)	1.7	1.7		2.1	2.1		1.9	1.9		1.8	1.8	
Lost Time Adjust (s)		-0.4			-0.6		-0.6	-0.6		-0.7	-0.7	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		1.0	1.0		1.0	1.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										12.0	12.0	
Pedestrian Calls (#/hr)										0	0	

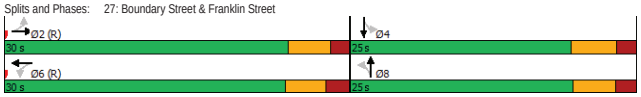
UNC DP TIA 2023 — No-Build (2030) AM
27: Boundary Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		44.1			44.1		7.9	7.9		8.0	8.0	
Actuated g/C Ratio		0.80			0.80		0.14	0.14		0.15	0.15	
v/c Ratio		0.13			0.33		0.02	0.16		0.23	0.12	
Control Delay		1.1			3.4		20.0	15.3		23.7	17.5	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		1.1			3.4		20.0	15.3		23.7	17.5	
LOS		A			A		B	B		C	B	
Approach Delay		1.1			3.4			15.6			21.3	
Approach LOS		A			A			B			C	
Queue Length 50th (ft)		7			46		1	6		14	6	
Queue Length 95th (ft)		10			78		7	27		38	25	
Internal Link Dist (ft)		1020			146			471			291	
Turn Bay Length (ft)							50			75		
Base Capacity (vph)		2661			2500		491	609		515	642	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.13			0.33		0.01	0.07		0.09	0.05	

Intersection Summary

Area Type: Other
Cycle Length: 55
Actuated Cycle Length: 55
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.33
Intersection Signal Delay: 4.2 — Intersection LOS: A
Intersection Capacity Utilization 54.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 27: Boundary Street & Franklin Street



UNC DP TIA 2023 — No-Build (2030) AM
28: Park Place & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	357	2	35	751	0	10
Future Volume (vph)	357	2	35	751	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	9	12
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.865	
Flt Protected				0.998		
Satd. Flow (prot)	3536	0	0	3532	1450	0
Flt Permitted				0.998		
Satd. Flow (perm)	3536	0	0	3532	1450	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	461			1129	375	
Travel Time (s)	12.6			30.8	10.2	
Confl. Peds. (#/hr)		9	9		2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	397	2	39	834	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	399	0	0	873	11	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 45.9% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
28: Park Place & Franklin Street — HCM 2010 TWSC

Intersection

Int Delay, s/veh 0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	357	2	35	751	0	10
Future Vol, veh/h	357	2	35	751	0	10
Conflicting Peds, #/hr	0	9	9	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	397	2	39	834	0	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	408	0	904	209
Stage 1	-	-	-	-	407	-
Stage 2	-	-	-	-	497	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1147	-	277	797
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	577	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1141	-	257	793
Mov Cap-2 Maneuver	-	-	-	-	257	-
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	539	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	793	-	-	1141	-
HCM Lane V/C Ratio	0.014	-	-	0.034	-
HCM Control Delay (s)	9.6	-	-	8.3	0.2
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	-

UNC DP TIA 2023 — No-Build (2030) AM
29: Battle Lane & Boundary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	52	42	0	0	67	37	0	57	14
Future Volume (vph)	0	0	0	52	42	0	0	67	37	0	57	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt								0.952			0.973	
Flt Protected					0.973							
Satd. Flow (prot)	0	0	0	0	1812	0	0	1773	0	0	1812	0
Flt Permitted					0.973							
Satd. Flow (perm)	0	0	0	0	1812	0	0	1773	0	0	1812	0
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		92			498			70			394	
Travel Time (s)		2.1			13.6			1.9			10.7	
Confl. Peds. (#/hr)			15			9	1		23	23		1
Confl. Bikes (#/hr)												3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	58	47	0	0	74	41	0	63	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	105	0	0	115	0	0	79	0
Sign Control		Stop			Stop			Yield			Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 29.0% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
30: Country Club Road & Battle Lane — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	44	320	386	107	109	0
Future Volume (vph)	44	320	386	107	109	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.971			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1809	0	1770	0
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1809	0	1770	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		90	508		70	
Travel Time (s)		2.5	13.9		1.9	
Confl. Peds. (#/hr)	9			23		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	49	356	429	119	121	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	356	548	0	121	0
Sign Control		Free	Free		Yield	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 46.7% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
31: Country Club Road & Paul Green Theater Drive/Gimghoul Road — Lanes, Volumes, Timings

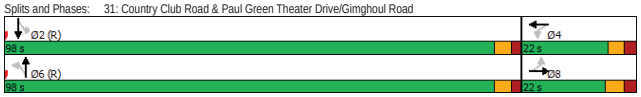
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	10	6	1	6	59	554	4	8	411	25
Future Volume (vph)	2	0	10	6	1	6	59	554	4	8	411	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			2%			1%			1%	
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95			0.96		0.95	1.00			0.99	
Frt		0.886			0.937			0.999			0.992	
Flt Protected		0.992			0.977		0.950				0.999	
Satd. Flow (prot)	0	1600	0	0	1653	0	1761	1851	0	0	1822	0
Flt Permitted		0.942			0.845		0.483				0.989	
Satd. Flow (perm)	0	1514	0	0	1406	0	852	1851	0	0	1804	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			7			1			8	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		153			324			421			824	
Travel Time (s)		4.2			8.8			11.5			22.5	
Confl. Peds. (#/hr)	5		9	9		5	18		4	4		18
Confl. Bikes (#/hr)						1			1			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	0	11	7	1	7	66	616	4	9	457	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	0	0	15	0	66	620	0	0	494	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2	2	
Detector Phase	8	8		4	4		6	6		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	21.0	21.0		18.6	18.6		15.1	15.1		15.1	15.1	
Total Split (s)	22.0	22.0		22.0	22.0		98.0	98.0		98.0	98.0	
Total Split (%)	18.3%	18.3%		18.3%	18.3%		81.7%	81.7%		81.7%	81.7%	
Maximum Green (s)	16.0	16.0		16.4	16.4		92.9	92.9		92.9	92.9	
Yellow Time (s)	3.5	3.5		3.1	3.1		3.1	3.1		3.1	3.1	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-0.6		-0.1	-0.1			-0.1	
Total Lost Time (s)		5.0			5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	11.0	11.0		9.0	9.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		8.0			7.8		112.8	112.8			112.8	
Actuated g/C Ratio		0.07			0.06		0.94	0.94			0.94	

UNC DP TIA 2023 — No-Build (2030) AM
31: Country Club Road & Paul Green Theater Drive/Gimghoul Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.11			0.15		0.08	0.36			0.29	
Control Delay		17.7			41.4		1.2	1.7			1.4	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		17.7			41.4		1.2	1.8			1.4	
LOS		B			D		A	A			A	
Approach Delay		17.7			41.4			1.7			1.4	
Approach LOS		B			D			A			A	
Queue Length 50th (ft)		0			6		0	0			0	
Queue Length 95th (ft)		16			29		11	128			78	
Internal Link Dist (ft)		73			244			341			744	
Turn Bay Length (ft)							50					
Base Capacity (vph)		230			205		801	1740			1696	
Starvation Cap Reductn		0			0		0	135			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.06			0.07		0.08	0.39			0.29	

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 4 (3%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 2.3 — Intersection LOS: A
Intersection Capacity Utilization 54.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 31: Country Club Road & Paul Green Theater Drive/Gimghoul Road



UNC DP TIA 2023 — No-Build (2030) AM
32: Hibbard Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	460	17	13	421	34	4	17	12	36	10	46
Future Volume (vph)	50	460	17	13	421	34	4	17	12	36	10	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			2%			-5%			-2%	
Storage Length (ft)	150		0	75		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.78	0.98		0.70	0.96			0.89			0.78	
Frt		0.995			0.989			0.951			0.932	
Flt Protected	0.950			0.950				0.994			0.981	
Satd. Flow (prot)	1778	3458	0	1752	3330	0	0	1653	0	0	1463	0
Flt Permitted	0.464			0.455				0.965			0.856	
Satd. Flow (perm)	680	3458	0	584	3330	0	0	1561	0	0	1171	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			11			13			51	
Link Speed (mph)		25			25			25			20	
Link Distance (ft)		469			330			188			294	
Travel Time (s)		12.8			9.0			5.1			10.0	
Confl. Peds. (#/hr)	208		340	340		208	249		190	190		249
Confl. Bikes (#/hr)			1						6			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	56	511	19	14	468	38	4	19	13	40	11	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	530	0	14	506	0	0	36	0	0	102	0
Turn Type	D.P+P	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.3	18.5		22.5	22.5		29.3	29.3		29.3	29.3	
Total Split (s)	16.0	54.0		38.0	38.0		36.0	36.0		36.0	36.0	
Total Split (%)	17.8%	60.0%		42.2%	42.2%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	10.7	48.5		32.5	32.5		29.7	29.7		29.7	29.7	
Yellow Time (s)	3.0	3.2		3.2	3.2		3.5	3.5		3.0	3.0	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.8	2.8		3.3	3.3	
Lost Time Adjust (s)	-0.1	-0.3		-0.4	-0.4			-1.3			-1.3	
Total Lost Time (s)	5.2	5.2		5.1	5.1			5.0			5.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		6.0		10.0	10.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	67.4	72.6		62.8	62.8			10.9			10.9	
Actuated g/C Ratio	0.75	0.81		0.70	0.70			0.12			0.12	

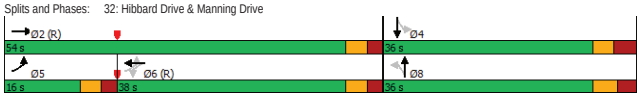
UNC DP TIA 2023 — No-Build (2030) AM
32: Hibbard Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.09	0.19		0.03	0.22			0.18			0.55	
Control Delay	2.6	2.1		6.6	5.9			26.5			31.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	2.6	2.1		6.6	5.9			26.5			31.1	
LOS	A	A		A	A			C			C	
Approach Delay		2.1			5.9			26.5			31.1	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	4	22		3	50			12			28	
Queue Length 95th (ft)	12	36		7	47			37			73	
Internal Link Dist (ft)		389			250			108			214	
Turn Bay Length (ft)	150			75								
Base Capacity (vph)	662	2790		407	2325			546			436	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.08	0.19		0.03	0.22			0.07			0.23	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 52 (58%), Referenced to phase 2:EBT and 6:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 6.8 — Intersection LOS: A
Intersection Capacity Utilization 53.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 32: Hibbard Drive & Manning Drive



No-Build (2030) AM.syn VHB

UNC DP TIA 2023 — No-Build (2030) AM
33: Paul Harden Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	383	19	159	648	29	8	10	26	24	1	9
Future Volume (vph)	7	383	19	159	648	29	8	10	26	24	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	12	10	10	12
Grade (%)		-2%			2%			8%			-11%	
Storage Length (ft)	200		0	0		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00		0.97	1.00		0.83	0.89		0.86	0.84	
Frt		0.993			0.994			0.891			0.864	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3535	0	1752	3468	0	1586	1317	0	1742	1329	0
Flt Permitted	0.360			0.493			0.750			0.731		
Satd. Flow (perm)	663	3535	0	881	3468	0	1044	1317	0	1153	1329	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			6			29			10	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		433			267			379			301	
Travel Time (s)		11.8			7.3			10.3			8.2	
Confl. Peds. (#/hr)	31		26	26		31	150		126	126		150
Confl. Bikes (#/hr)			1						2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	426	21	177	720	32	9	11	29	27	1	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	447	0	177	752	0	9	40	0	27	11	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.9	23.1		11.9	22.1		28.8	28.8		30.3	30.3	
Total Split (s)	14.0	38.0		20.0	44.0		32.0	32.0		32.0	32.0	
Total Split (%)	15.6%	42.2%		22.2%	48.9%		35.6%	35.6%		35.6%	35.6%	
Maximum Green (s)	9.1	32.9		15.1	38.9		26.2	26.2		25.7	25.7	
Yellow Time (s)	3.0	3.3		3.0	3.3		3.0	3.0		3.5	3.5	
All-Red Time (s)	1.9	1.8		1.9	1.8		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.2	-0.1		0.1	0.1		-0.4	-0.4		-0.9	-0.9	
Total Lost Time (s)	5.1	5.0		5.0	5.2		5.4	5.4		5.4	5.4	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			10.0		16.0	16.0		17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	77.2	61.8		71.3	75.8		8.4	8.4		8.6	8.6	

No-Build (2030) AM.syn VHB

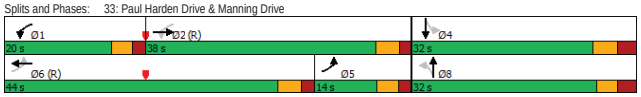
UNC DP TIA 2023 — No-Build (2030) AM
33: Paul Harden Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.86	0.69		0.79	0.84		0.09	0.09		0.10	0.10	
v/c Ratio	0.01	0.18		0.22	0.26		0.09	0.27		0.25	0.08	
Control Delay	2.7	5.7		2.8	3.5		38.6	22.8		42.9	22.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.7	5.7		2.8	3.5		38.6	22.8		42.9	22.0	
LOS	A	A		A	A		D	C		D	C	
Approach Delay		5.6			3.4			25.7			36.9	
Approach LOS		A			A			C			D	
Queue Length 50th (ft)	1	34		17	43		5	6		15	1	
Queue Length 95th (ft)	3	77		36	125		19	35		40	16	
Internal Link Dist (ft)		353			187			299			221	
Turn Bay Length (ft)	200						75			100		
Base Capacity (vph)	683	2430		883	2921		308	409		340	399	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.18		0.20	0.26		0.03	0.10		0.08	0.03	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 82 (91%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.27
Intersection Signal Delay: 5.7 — Intersection LOS: A
Intersection Capacity Utilization 57.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 33: Paul Harden Drive & Manning Drive



No-Build (2030) AM.syn VHB

UNC DP TIA 2023 — No-Build (2030) AM
34: East Drive & Dogwood Deck Entrance/Jackson Circle — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	1	0	1	18	292	4	58	101	214
Future Volume (vph)	0	0	0	1	0	1	18	292	4	58	101	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	12	12	10	12	12
Storage Length (ft)	0		0	0		0	100		0	75		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998			0.898	
Flt Protected					0.976		0.950			0.950		
Satd. Flow (prot)	0	0	0	0	1694	0	1652	1859	0	1652	1673	0
Flt Permitted					0.976		0.950			0.950		
Satd. Flow (perm)	0	0	0	0	1694	0	1652	1859	0	1652	1673	0
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		321			259			210			315	
Travel Time (s)		7.3			7.1			5.7			8.6	
Confl. Peds. (#/hr)	19					19	4		1	1		4
Confl. Bikes (#/hr)									2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1	0	1	20	324	4	64	112	238
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2	0	20	328	0	64	350	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 40.1% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
34: East Drive & Dogwood Deck Entrance/Jackson Circle — HCM 2010 TWSC

Intersection
Int Delay, s/veh 1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	0	1	18	292	4	58	101	214
Future Vol, veh/h	0	0	0	1	0	1	18	292	4	58	101	214
Conflicting Peds, #/hr	19	0	0	0	0	19	4	0	1	1	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	3801088		-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	1	0	1	20	324	4	64	112	238

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	726	849	346	354	0	0	329	0	0
Stage 1	367	367	-	-	-	-	-	-	-
Stage 2	359	482	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	391	298	697	1205	-	-	1231	-	-
Stage 1	701	622	-	-	-	-	-	-	-
Stage 2	707	553	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	364	0	685	1205	-	-	1230	-	-
Mov Cap-2 Maneuver	364	0	-	-	-	-	-	-	-
Stage 1	688	0	-	-	-	-	-	-	-
Stage 2	670	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0.5	1.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBRWBLn1	SBL	SBT	SBR
Capacity (veh/h)	1205	-	- 475	1230	-	-
HCM Lane V/C Ratio	0.017	-	- 0.005	0.052	-	-
HCM Control Delay (s)	8	-	- 12.6	8.1	-	-
HCM Lane LOS	A	-	- B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	- 0	0.2	-	-

UNC DP TIA 2023 — No-Build (2030) AM
35: East Drive & Dogwood Deck Exit — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	172	96	0	157	62	0
Future Volume (vph)	172	96	0	157	62	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1770	1583	0	1863	1863	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	1583	0	1863	1863	0
Link Speed (mph)	30			25	30	
Link Distance (ft)	134			176	210	
Travel Time (s)	3.0			4.8	4.8	
Confl. Peds. (#/hr)	8	1	6			6
Confl. Bikes (#/hr)						8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	191	107	0	174	69	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	191	107	0	174	69	0
Sign Control	Stop			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 24.6% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
35: East Drive & Dogwood Deck Exit — HCM 2010 TWSC

Intersection
Int Delay, s/veh 5.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	172	96	0	157	62	0
Future Vol, veh/h	172	96	0	157	62	0
Conflicting Peds, #/hr	8	1	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	191	107	0	174	69	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	251	70	-	0	-	0
Stage 1	69	-	-	-	-	-
Stage 2	182	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	738	993	0	-	-	0
Stage 1	954	-	0	-	-	0
Stage 2	849	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	738	992	-	-	-	-
Mov Cap-2 Maneuver	738	-	-	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	849	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	738	992	-
HCM Lane V/C Ratio	-	0.259	0.108	-
HCM Control Delay (s)	-	11.6	9.1	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	1	0.4	-

UNC DP TIA 2023 — No-Build (2030) AM
36: Mason Farm Road & Hibbard Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	36	12	10	148	104	3	4	2	23	4	25
Future Volume (vph)	37	36	12	10	148	104	3	4	2	23	4	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.946			0.970			0.935	
Flt Protected		0.979			0.998			0.984			0.978	
Satd. Flow (prot)	0	1729	0	0	1700	0	0	1659	0	0	1590	0
Flt Permitted		0.979			0.998			0.984			0.978	
Satd. Flow (perm)	0	1729	0	0	1700	0	0	1659	0	0	1590	0
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		221			213			480			560	
Travel Time (s)		6.0			5.8			10.9			15.3	
Confl. Peds. (#/hr)	3		4	4		3	29		59	59		29
Confl. Bikes (#/hr)									20			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	41	40	13	11	164	116	3	4	2	26	4	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	94	0	0	291	0	0	9	0	0	58	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 40.0% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
36: Mason Farm Road & Hibbard Drive — HCM 2010 TWSC

Intersection
Int Delay, s/veh 11.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	36	12	10	148	104	3	4	2	23	4	25
Future Vol, veh/h	37	36	12	10	148	104	3	4	2	23	4	25
Conflicting Peds, #/hr	3	0	4	4	0	3	29	0	59	59	0	29
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	40	13	11	164	116	3	4	2	26	4	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	253	170	51	171	183	67	61	0	0	65	0	0
Stage 1	99	99	-	70	70	-	-	-	-	-	-	-
Stage 2	154	71	-	101	113	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	700	723	1017	792	711	997	1542	-	-	1537	-	-
Stage 1	907	813	-	940	837	-	-	-	-	-	-	-
Stage 2	848	836	-	905	802	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	476	662	992	699	651	950	1508	-	-	1468	-	-
Mov Cap-2 Maneuver	476	662	-	699	651	-	-	-	-	-	-	-
Stage 1	885	780	-	896	798	-	-	-	-	-	-	-
Stage 2	589	797	-	829	770	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	12.9	2.5	3.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1508	-	-	589	746	1468	-	-
HCM Lane V/C Ratio	0.002	-	-	0.16	0.39	0.017	-	-
HCM Control Delay (s)	7.4	0	-	12.3	12.9	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	1.9	0.1	-	-

UNC DP TIA 2023 — No-Build (2030) AM
37: Bell Tower Drive & South Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	310	143	147	317	50	95
Future Volume (vph)	310	143	147	317	50	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	50		0	100
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.83		0.83		0.40	0.48
Frt	0.957					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1486	0	1770	1863	1770	1583
Flt Permitted			0.406		0.950	
Satd. Flow (perm)	1486	0	628	1863	699	762
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	40					106
Link Speed (mph)	25			25	30	
Link Distance (ft)	696			744	512	
Travel Time (s)	19.0			20.3	11.6	
Confl. Peds. (#/hr)		217	217		410	211
Confl. Bikes (#/hr)		24				4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	344	159	163	352	56	106
Shared Lane Traffic (%)						
Lane Group Flow (vph)	503	0	163	352	56	106
Turn Type	NA		D.P+P	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			2		8	8
Detector Phase	2		1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	7.0	7.0
Minimum Split (s)	22.4		12.4	15.4	22.5	22.5
Total Split (s)	48.3		12.5	60.8	24.2	24.2
Total Split (%)	56.8%		14.7%	71.5%	28.5%	28.5%
Maximum Green (s)	42.9		7.1	55.4	19.1	19.1
Yellow Time (s)	3.3		3.0	3.3	3.4	3.4
All-Red Time (s)	2.1		2.4	2.1	1.7	1.7
Lost Time Adjust (s)	-0.5		-0.4	-0.4	-0.1	-0.1
Total Lost Time (s)	4.9		5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?			Yes			
Vehicle Extension (s)	3.0		1.0	3.0	2.0	2.0
Recall Mode	C-Min		None	Min	None	None
Walk Time (s)	7.0				7.0	7.0
Flash Dont Walk (s)	10.0				10.0	10.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	53.1		60.5	66.5	11.9	11.9
Actuated g/C Ratio	0.62		0.71	0.78	0.14	0.14
v/c Ratio	0.53		0.30	0.24	0.58	0.54

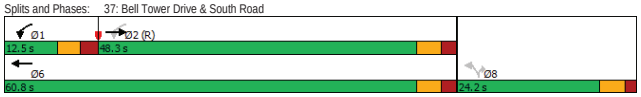
UNC DP TIA 2023 — No-Build (2030) AM
37: Bell Tower Drive & South Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	12.8		4.1	2.5	55.5	17.0
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	12.8		4.1	2.5	55.5	17.0
LOS	B		A	A	E	B
Approach Delay	12.8			3.0	30.3	
Approach LOS	B			A	C	
Queue Length 50th (ft)	132		11	27	29	0
Queue Length 95th (ft)	280		27	50	62	44
Internal Link Dist (ft)	616			664	432	
Turn Bay Length (ft)			50			100
Base Capacity (vph)	942		550	1458	157	254
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.53		0.30	0.24	0.36	0.42

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 73 (86%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 10.9 — Intersection LOS: B
Intersection Capacity Utilization 62.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 37: Bell Tower Drive & South Road



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	407	255	0	92	33
Future Volume (vph)	0	407	255	0	92	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					0.96	0.96
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3539	3539	0	1770	1583
Flt Permitted					0.950	
Satd. Flow (perm)	0	3539	3539	0	1700	1513
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						37
Link Speed (mph)		35	35		20	
Link Distance (ft)		334	382		292	
Travel Time (s)		6.5	7.4		10.0	
Confl. Peds. (#/hr)	109			109	38	32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	452	283	0	102	37
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	452	283	0	102	37
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		10.0	10.0		7.0	7.0
Minimum Split (s)		14.7	19.4		31.1	31.1
Total Split (s)		47.0	47.0		43.0	43.0
Total Split (%)		52.2%	52.2%		47.8%	47.8%
Maximum Green (s)		42.3	42.6		37.9	37.9
Yellow Time (s)		3.3	3.0		3.0	3.0
All-Red Time (s)		1.4	1.4		2.1	2.1
Lost Time Adjust (s)		0.3	0.6		-0.1	-0.1
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		2.0	2.0		2.0	2.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		19.0	19.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		73.4	73.4		10.1	10.1
Actuated g/C Ratio		0.82	0.82		0.11	0.11
v/c Ratio		0.16	0.10		0.52	0.18
Control Delay		2.1	0.9		46.4	13.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		2.1	0.9		46.4	13.8
LOS		A	A		D	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Approach Delay		2.1	0.9		37.7	
Approach LOS		A	A		D	
Queue Length 50th (ft)		18	7		56	0
Queue Length 95th (ft)		32	3		101	27
Internal Link Dist (ft)		254	302		212	
Turn Bay Length (ft)						
Base Capacity (vph)		2884	2884		747	660
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.16	0.10		0.14	0.06

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 15 (17%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 7.4 — Intersection LOS: A
Intersection Capacity Utilization 37.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 38: Manning Drive & Hospital Exit



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	360	135	183	445	10	21
Future Volume (vph)	360	135	183	445	10	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.959					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3394	0	1770	3539	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3394	0	1770	3539	1770	1583
Link Speed (mph)	25			25	15	
Link Distance (ft)	330			433	367	
Travel Time (s)	9.0			11.8	16.7	
Confl. Peds. (#/hr)		17	17		19	
Confl. Bikes (#/hr)		9				1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	400	150	203	494	11	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	550	0	203	494	11	23
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 38.2% — ICU Level of Service A
Analysis Period (min) 15

Intersection

Int Delay, s/veh 2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	360	135	183	445	10	21
Future Vol, veh/h	360	135	183	445	10	21
Conflicting Peds, #/hr	0	17	17	0	19	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	400	150	203	494	11	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	567	0	1164	292
Stage 1	-	-	-	-	492	-
Stage 2	-	-	-	-	672	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1001	-	188	704
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	469	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	987	-	145	694
Mov Cap-2 Maneuver	-	-	-	-	145	-
Stage 1	-	-	-	-	572	-
Stage 2	-	-	-	-	366	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	17.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	145	694	-	-	987	-
HCM Lane V/C Ratio	0.077	0.034	-	-	0.206	-
HCM Control Delay (s)	31.9	10.4	-	-	9.6	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.8	-

UNC DP TIA 2023 — No-Build (2030) AM
101: US 15/501 & Estes Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	3	219	10	2	5	262	1262	5	2	1258	85
Future Volume (vph)	119	3	219	10	2	5	262	1262	5	2	1258	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		0	150		0	250		0	220		225
Storage Lanes	0		2	0		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.98			0.99							
Frt			0.850		0.957			0.999				0.850
Flt Protected		0.953			0.972		0.950			0.950		
Satd. Flow (prot)	0	1758	2760	0	1695	0	3400	3501	0	1752	3505	1568
Flt Permitted		0.953			0.972		0.950			0.950		
Satd. Flow (perm)	0	1720	2760	0	1695	0	3400	3501	0	1752	3505	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			243		6			1				126
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		1824			872			1606			1920	
Travel Time (s)		41.5			19.8			24.3			29.1	
Confl. Peds. (#/hr)	7					7						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	132	3	243	11	2	6	291	1402	6	2	1398	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	135	243	0	19	0	291	1408	0	2	1398	94
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	3	3	5	4	4		5	2		1	6	3
Permitted Phases			3									6
Detector Phase	3	3	5	4	4		5	2		1	6	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.6	13.6	13.7	13.7	13.7		13.7	18.1		13.5	18.1	13.6
Total Split (s)	15.0	15.0	16.0	13.7	13.7		16.0	47.8		13.5	45.3	15.0
Total Split (%)	16.7%	16.7%	17.8%	15.2%	15.2%		17.8%	53.1%		15.0%	50.3%	16.7%
Maximum Green (s)	8.4	8.4	9.3	7.0	7.0		9.3	41.7		7.0	39.2	8.4
Yellow Time (s)	3.8	3.8	3.0	3.2	3.2		3.0	4.4		3.0	4.6	3.8
All-Red Time (s)	2.8	2.8	3.7	3.5	3.5		3.7	1.7		3.5	1.5	2.8
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.6	6.7		6.7		6.7	6.1		6.5	6.1	6.6
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	3.0	1.0	1.0		3.0	6.0		3.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)		9.5	27.0		7.0		10.8	59.6		7.0	44.8	57.7
Actuated g/C Ratio		0.11	0.30		0.08		0.12	0.66		0.08	0.50	0.64

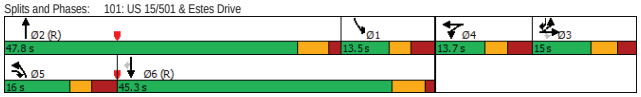
UNC DP TIA 2023 — No-Build (2030) AM
101: US 15/501 & Estes Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.73	0.24		0.14		0.71	0.61		0.01	0.80	0.09
Control Delay		63.2	4.2		33.1		49.5	12.7		39.0	22.1	1.1
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		63.2	4.2		33.1		49.5	12.7		39.0	22.1	1.1
LOS		E	A		C		D	B		D	C	A
Approach Delay		25.3			33.1			19.0			20.8	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		73	0		7		80	165		1	316	3
Queue Length 95th (ft)		#177	30		29		#151	464		m2	545	m13
Internal Link Dist (ft)		1744			792			1526			1840	
Turn Bay Length (ft)							250			220		225
Base Capacity (vph)		188	996		137		409	2318		136	1743	1053
Starvation Cap Reductn		0	0		0		0	0		0	0	0
Spillback Cap Reductn		0	0		0		0	0		0	0	0
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		0.72	0.24		0.14		0.71	0.61		0.01	0.80	0.09

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 19 (21%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 20.5 — Intersection LOS: C
Intersection Capacity Utilization 68.6% — ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: US 15/501 & Estes Drive



UNC DP TIA 2023 — No-Build (2030) AM
102: US 15/501 & Willow Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	14	24	54	39	38	155	1254	36	28	1369	263
Future Volume (vph)	65	14	24	54	39	38	155	1254	36	28	1369	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	220		0	220		260
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.98		0.98	0.99			1.00				0.97
Frt		0.906			0.926			0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1635	0	1752	1694	0	1752	3489	0	1752	3505	1568
Flt Permitted	0.702			0.586			0.106			0.151		
Satd. Flow (perm)	1295	1635	0	1058	1694	0	196	3489	0	279	3505	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			23			3				187
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		1227			1197			1920			792	
Travel Time (s)		33.5			32.6			29.1			12.0	
Confl. Peds. (#/hr)			11	11			2					2
Confl. Bikes (#/hr)						3			1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	72	16	27	60	43	42	172	1393	40	31	1521	292
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	43	0	60	85	0	172	1433	0	31	1521	292
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	12.0
Minimum Split (s)	15.0	33.0		15.0	33.0		15.0	90.0		15.0	80.0	80.0
Total Split (s)	15.0	33.0		15.0	33.0		26.0	117.0		15.0	106.0	106.0
Total Split (%)	8.3%	18.3%		8.3%	18.3%		14.4%	65.0%		8.3%	58.9%	58.9%
Maximum Green (s)	8.7	26.6		9.1	26.6		19.9	110.9		9.4	99.9	99.9
Yellow Time (s)	3.0	3.9		3.0	3.9		3.0	4.6		3.0	4.6	4.6
All-Red Time (s)	3.3	2.5		2.9	2.5		3.1	1.5		2.6	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.4		5.9	6.4		6.1	6.1		5.6	6.1	6.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Walk Time (s)		4.0									5.0	5.0
Flash Dont Walk (s)		22.0									9.0	9.0
Pedestrian Calls (#/hr)		0									0	0
Act Effct Green (s)	18.6	11.6		21.7	11.4		140.8	131.4		129.5	122.0	122.0

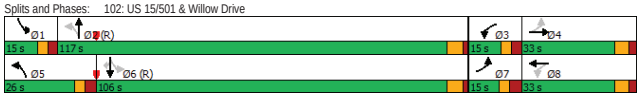
UNC DP TIA 2023 — No-Build (2030) AM
102: US 15/501 & Willow Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.10	0.06		0.12	0.06		0.78	0.73		0.72	0.68	0.68
v/c Ratio	0.46	0.33		0.35	0.66		0.64	0.56		0.12	0.64	0.27
Control Delay	78.6	43.6		72.4	83.0		23.3	13.5		4.1	9.8	1.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.1	0.0
Total Delay	78.6	43.6		72.4	83.0		23.3	13.5		4.1	9.9	1.4
LOS	E	D		E	F		C	B		A	A	A
Approach Delay		65.5			78.6			14.5			8.5	
Approach LOS		E			E			B			A	
Queue Length 50th (ft)	77	18		64	73		57	450		5	337	5
Queue Length 95th (ft)	128	62		110	136		m142	506		m8	232	11
Internal Link Dist (ft)		1147			1117			1840			712	
Turn Bay Length (ft)	200						220			220		260
Base Capacity (vph)	158	264		172	269		328	2546		281	2376	1088
Starvation Cap Reductn	0	0		0	0		0	0		0	151	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.46	0.16		0.35	0.32		0.52	0.56		0.11	0.68	0.27

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 176 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 15.6 — Intersection LOS: B
Intersection Capacity Utilization 75.7% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: US 15/501 & Willow Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	29	35	151	95	55	146	106	1175	58	5	73	1291
Future Volume (vph)	29	35	151	95	55	146	106	1175	58	5	73	1291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	525		150	350		150	350		175		225	
Storage Lanes	1		1	2		1	1		1		1	
Taper Length (ft)	25			25			25				25	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Ped Bike Factor												
Frt			0.850			0.850			0.850			
Flt Protected	0.950			0.950			0.950				0.950	
Satd. Flow (prot)	1752	1863	1568	3433	1863	1583	1752	3505	1583	0	1768	3505
Flt Permitted	0.950			0.950			0.135				0.170	
Satd. Flow (perm)	1752	1863	1568	3433	1863	1583	249	3505	1583	0	316	3505
Right Turn on Red			Yes			Yes			Yes			
Satd. Flow (RTOR)			60			79			60			
Link Speed (mph)		30			30			45				45
Link Distance (ft)		828			950			792				1376
Travel Time (s)		18.8			21.6			12.0				20.8
Confl. Peds. (#/hr)							1					
Peak Hour Factor	0.90	0.92	0.90	0.92	0.92	0.92	0.90	0.90	0.92	0.90	0.92	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	103%	100%	100%
Heavy Vehicles (%)	3%	2%	3%	2%	2%	2%	3%	3%	2%	3%	2%	3%
Adj. Flow (vph)	32	38	168	103	60	159	118	1306	63	6	79	1434
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	38	168	103	60	159	118	1306	63	0	85	1434
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	7	4	5	3	8	1!	5	2	3	1!	1	6
Permitted Phases			4			8	6		2	2	2	
Detector Phase	7	4	5	3	8	1	5	2	3	1	1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	12.0
Minimum Split (s)	13.4	43.5	13.3	13.6	40.5	13.4	13.3	42.5	13.6	13.4	13.4	36.5
Total Split (s)	14.0	43.5	22.0	15.1	44.6	16.0	22.0	105.4	15.1	16.0	16.0	99.4
Total Split (%)	7.8%	24.2%	12.2%	8.4%	24.8%	8.9%	12.2%	58.6%	8.4%	8.9%	8.9%	55.2%
Maximum Green (s)	7.6	37.0	15.7	8.5	38.1	9.6	15.7	98.9	8.5	9.6	9.6	92.9
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.5	3.0	3.0	3.0	4.5
All-Red Time (s)	3.4	2.7	3.3	3.6	2.7	3.4	3.3	2.0	3.6	3.4	3.4	2.0
Lost Time Adjust (s)	-1.4	-1.5	-1.3	-1.6	-1.5	-1.4	-1.3	-1.5	-1.6		-1.4	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes			Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	45.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	None	C-Min
Walk Time (s)		7.0			7.0			7.0				7.0
Flash Dont Walk (s)		30.0			27.0			29.0				23.0

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	30
Future Volume (vph)	30
Ideal Flow (vphpl)	1900
Storage Length (ft)	100
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Ped Bike Factor	0.98
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1568
Flt Permitted	
Satd. Flow (perm)	1532
Right Turn on Red	Yes
Satd. Flow (RTOR)	60
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	0.90
Growth Factor	100%
Heavy Vehicles (%)	3%
Adj. Flow (vph)	33
Shared Lane Traffic (%)	
Lane Group Flow (vph)	33
Turn Type	pm+ov
Protected Phases	7
Permitted Phases	6
Detector Phase	7
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	13.4
Total Split (s)	14.0
Total Split (%)	7.8%
Maximum Green (s)	7.6
Yellow Time (s)	3.0
All-Red Time (s)	3.4
Lost Time Adjust (s)	-1.4
Total Lost Time (s)	5.0
Lead/Lag	Lead
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Minimum Gap (s)	2.0
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	None
Walk Time (s)	
Flash Dont Walk (s)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Pedestrian Calls (#/hr)		0			0			0				0
Act Effct Green (s)	9.7	10.4	26.6	11.4	12.0	25.9	140.9	132.1	148.5		140.9	127.0
Actuated g/C Ratio	0.05	0.06	0.15	0.06	0.07	0.14	0.78	0.73	0.82		0.78	0.71
v/c Ratio	0.34	0.36	0.60	0.47	0.48	0.54	0.38	0.51	0.05		0.27	0.58
Control Delay	91.4	90.2	52.6	88.2	93.2	41.8	10.0	4.7	0.1		3.3	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0		0.0	0.0
Total Delay	91.4	90.2	52.6	88.2	93.2	41.8	10.0	4.8	0.1		3.3	6.2
LOS	F	F	D	F	F	D	B	A	A		A	A
Approach Delay		63.8			66.3			5.0				5.9
Approach LOS		E			E			A				A
Queue Length 50th (ft)	37	44	120	61	70	88	15	127	1		6	189
Queue Length 95th (ft)	78	87	194	95	122	167	35	68	1		23	195
Internal Link Dist (ft)		748			870			712				1296
Turn Bay Length (ft)	525		150	350		150	350		175		225	
Base Capacity (vph)	96	398	311	223	409	313	344	2572	1319		339	2473
Starvation Cap Reductn	0	0	0	0	0	0	0	214	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.33	0.10	0.54	0.46	0.15	0.51	0.34	0.55	0.05		0.25	0.58

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 36 (20%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 14.8 — Intersection LOS: B
Intersection Capacity Utilization 69.9% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 103: US 15/501 & Elliott Road



Lane Group	SBR
Pedestrian Calls (#/hr)	
Act Effct Green (s)	136.7
Actuated g/C Ratio	0.76
v/c Ratio	0.03
Control Delay	0.5
Queue Delay	0.0
Total Delay	0.5
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	1
Queue Length 95th (ft)	m2
Internal Link Dist (ft)	
Turn Bay Length (ft)	100
Base Capacity (vph)	1182
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.03

Intersection Summary

UNC DP TIA 2023 — No-Build (2030) AM
104: US 15/501 & Eastgate/Ephesus Church Road — Lanes, Volumes, Timings

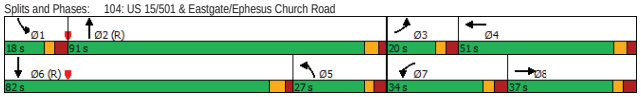
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	24	85	172	50	13	100	1025	132	35	1060	11
Future Volume (vph)	51	24	85	172	50	13	100	1025	132	35	1060	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	260		200	220		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99			0.99		1.00				1.00	
Frt		0.883			0.970				0.850		0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1609	0	3400	1780	0	1752	3505	1568	1752	3497	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1730	1609	0	3400	1780	0	1751	3505	1568	1752	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		84			7				226		1	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		448			1242			1376			811	
Travel Time (s)		12.2			33.9			20.8			12.3	
Confl. Peds. (#/hr)	8					8	1					1
Confl. Bikes (#/hr)			3			2						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	57	27	94	191	56	14	111	1139	147	39	1178	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	121	0	191	70	0	111	1139	147	39	1190	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Free	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									Free			
Detector Phase	3	8		7	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	20.0	36.9		33.8	37.7		20.0	80.0		18.0	68.0	
Total Split (s)	20.0	37.0		34.0	51.0		27.0	91.0		18.0	82.0	
Total Split (%)	11.1%	20.6%		18.9%	28.3%		15.0%	50.6%		10.0%	45.6%	
Maximum Green (s)	13.6	30.1		27.2	44.3		20.2	84.2		11.3	75.3	
Yellow Time (s)	3.0	3.0		3.0	3.8		3.0	4.5		3.0	4.5	
All-Red Time (s)	3.4	3.9		3.8	2.9		3.8	2.3		3.7	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.9		6.8	6.7		6.8	6.8		6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.0	2.0		4.0	6.0		2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	60.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	

UNC DP TIA 2023 — No-Build (2030) AM
104: US 15/501 & Eastgate/Ephesus Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		23.0			24.0			17.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	10.3	10.7		15.4	19.2		20.2	120.5	180.0	8.9	106.4	
Actuated g/C Ratio	0.06	0.06		0.09	0.11		0.11	0.67	1.00	0.05	0.59	
v/c Ratio	0.58	0.69		0.66	0.36		0.57	0.49	0.09	0.45	0.58	
Control Delay	104.1	48.3		90.3	72.7		73.1	7.0	0.1	109.8	14.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	104.1	48.3		90.3	72.7		73.1	7.0	0.1	109.8	14.0	
LOS	F	D		F	E		E	A	A	F	B	
Approach Delay		66.2			85.6			11.5			17.1	
Approach LOS		E			F			B			B	
Queue Length 50th (ft)	67	43		114	72		129	177	0	46	286	
Queue Length 95th (ft)	121	116		158	125		195	108	0	m83	362	
Internal Link Dist (ft)		368			1162			1296			731	
Turn Bay Length (ft)				200			260		200	220		
Base Capacity (vph)	132	339		513	443		196	2346	1568	111	2067	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.43	0.36		0.37	0.16		0.57	0.49	0.09	0.35	0.58	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 20 (11%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 23.2 — Intersection LOS: C
Intersection Capacity Utilization 67.2% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: US 15/501 & Eastgate/Ephesus Church Road



No-Build (2030) AM.syn VHB

UNC DP TIA 2023 — No-Build (2030) AM
105: US 15/501 SB & Erwin Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Lane Configurations							
Traffic Volume (vph)	0	0	1749	294	0	485	
Future Volume (vph)	0	0	1749	294	0	485	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0			0	0	300	
Storage Lanes	0			1	0	1	
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.88	
Ped Bike Factor							
Frt				0.850		0.850	
Flt Protected							
Satd. Flow (prot)	0	0	5036	1568	0	2760	
Flt Permitted							
Satd. Flow (perm)	0	0	5036	1568	0	2760	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				101		36	
Link Speed (mph)		45	45		35		
Link Distance (ft)		777	779		938		
Travel Time (s)		11.8	11.8		18.3		
Confl. Peds. (#/hr)					4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	
Adj. Flow (vph)	0	0	1943	327	0	539	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	1943	327	0	539	
Turn Type			NA	Free		Prot	
Protected Phases			6			8	4
Permitted Phases				Free			
Detector Phase			6			8	
Switch Phase							
Minimum Initial (s)			12.0			7.0	7.0
Minimum Split (s)			117.0			27.4	15.0
Total Split (s)			126.0			54.0	54.0
Total Split (%)			70.0%			30.0%	30%
Maximum Green (s)			119.8			48.6	48.6
Yellow Time (s)			4.5			3.0	3.0
All-Red Time (s)			1.7			2.4	2.4
Lost Time Adjust (s)			0.0			0.0	
Total Lost Time (s)			6.2			5.4	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)			6.0			0.2	1.0
Minimum Gap (s)			2.0			2.0	2.0
Time Before Reduce (s)			15.0			0.0	0.0
Time To Reduce (s)			45.0			0.0	0.0
Recall Mode			C-Max			None	None
Walk Time (s)						7.0	
Flash Dont Walk (s)						15.0	

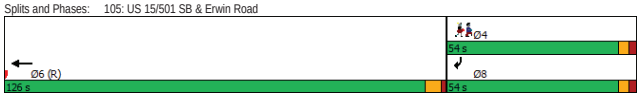
No-Build (2030) AM.syn VHB

UNC DP TIA 2023 — No-Build (2030) AM
105: US 15/501 SB & Erwin Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Pedestrian Calls (#/hr)						0	
Act Effct Green (s)			132.0	180.0		36.4	
Actuated g/C Ratio			0.73	1.00		0.20	
v/c Ratio			0.53	0.21		0.92	
Control Delay			6.6	0.2		86.8	
Queue Delay			0.3	0.0		0.0	
Total Delay			6.9	0.2		86.8	
LOS			A	A		F	
Approach Delay			6.0		86.8		
Approach LOS			A		F		
Queue Length 50th (ft)			198	0		338	
Queue Length 95th (ft)			405	0		398	
Internal Link Dist (ft)		697	699		858		
Turn Bay Length (ft)						300	
Base Capacity (vph)			3692	1568		771	
Starvation Cap Reductn			946	0		0	
Spillback Cap Reductn			0	0		0	
Storage Cap Reductn			0	0		0	
Reduced v/c Ratio			0.71	0.21		0.70	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 152 (84%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 21.5 — Intersection LOS: C
Intersection Capacity Utilization 61.0% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 105: US 15/501 SB & Erwin Road



No-Build (2030) AM.syn VHB

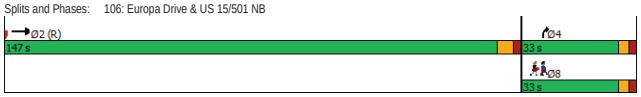
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations							
Traffic Volume (vph)	1932	104	0	0	0	153	
Future Volume (vph)	1932	104	0	0	0	153	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		250	0		0	0	
Storage Lanes		1	0		0	2	
Taper Length (ft)			25		25		
Lane Util. Factor	0.86	1.00	1.00	1.00	1.00	0.88	
Ped Bike Factor							
Frt		0.850				0.850	
Flt Protected							
Satd. Flow (prot)	6408	1583	0	0	0	2787	
Flt Permitted							
Satd. Flow (perm)	6408	1583	0	0	0	2787	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		41				46	
Link Speed (mph)	45			45	25		
Link Distance (ft)	764			605	662		
Travel Time (s)	11.6			9.2	18.1		
Confl. Peds. (#/hr)					4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	2147	116	0	0	0	170	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	2147	116	0	0	0	170	
Turn Type	NA	Free				Prot	
Protected Phases	2					4	8
Permitted Phases		Free					
Detector Phase	2					4	
Switch Phase							
Minimum Initial (s)	12.0					7.0	7.0
Minimum Split (s)	126.0					26.0	28.3
Total Split (s)	147.0					33.0	33.0
Total Split (%)	81.7%					18.3%	18%
Maximum Green (s)	140.2					27.7	27.7
Yellow Time (s)	4.5					3.0	3.0
All-Red Time (s)	2.3					2.3	2.3
Lost Time Adjust (s)	0.0					0.0	
Total Lost Time (s)	6.8					5.3	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	6.0					1.0	0.2
Minimum Gap (s)	2.0					2.0	2.0
Time Before Reduce (s)	15.0					0.0	0.0
Time To Reduce (s)	45.0					0.0	0.0
Recall Mode	C-Max					None	None
Walk Time (s)							7.0
Flash Dont Walk (s)							16.0
Pedestrian Calls (#/hr)							2
Act Effct Green (s)	155.0	180.0				12.9	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Actuated g/C Ratio	0.86	1.00				0.07	
v/c Ratio	0.39	0.07				0.70	
Control Delay	1.6	0.1				73.8	
Queue Delay	0.1	0.0				0.0	
Total Delay	1.7	0.1				73.8	
LOS	A	A				E	
Approach Delay	1.7				73.8		
Approach LOS	A				E		
Queue Length 50th (ft)	82	0				83	
Queue Length 95th (ft)	117	m0				124	
Internal Link Dist (ft)	684			525	582		
Turn Bay Length (ft)		250					
Base Capacity (vph)	5516	1583				467	
Starvation Cap Reductn	1652	0				0	
Spillback Cap Reductn	0	0				0	
Storage Cap Reductn	0	0				0	
Reduced v/c Ratio	0.56	0.07				0.36	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 47 (26%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 6.7 Intersection LOS: A
Intersection Capacity Utilization 43.9% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Europa Drive & US 15/501 NB



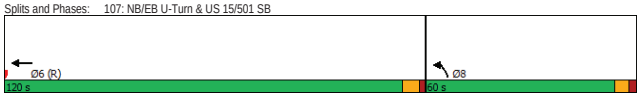
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1783	314	0
Future Volume (vph)	0	0	0	1783	314	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Right Turn on Red		Yes			Yes	Yes
Satd. Flow (RTOR)					29	
Link Speed (mph)	45			45	35	
Link Distance (ft)	779			295	205	
Travel Time (s)	11.8			4.5	4.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1981	349	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1981	349	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				12.0	7.0	
Minimum Split (s)				120.0	60.0	
Total Split (s)				120.0	60.0	
Total Split (%)				66.7%	33.3%	
Maximum Green (s)				113.3	53.5	
Yellow Time (s)				4.7	4.0	
All-Red Time (s)				2.0	2.5	
Lost Time Adjust (s)				0.0	0.0	
Total Lost Time (s)				6.7	6.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				6.0	5.0	
Minimum Gap (s)				2.0	2.0	
Time Before Reduce (s)				15.0	0.0	
Time To Reduce (s)				45.0	0.0	
Recall Mode				C-Max	None	
Act Effct Green (s)				142.6	24.2	
Actuated g/C Ratio				0.79	0.13	
v/c Ratio				0.71	0.72	
Control Delay				2.2	70.3	
Queue Delay				0.4	0.0	
Total Delay				2.6	70.3	
LOS				A	E	
Approach Delay				2.6	70.3	
Approach LOS				A	E	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Queue Length 50th (ft)				25	180	
Queue Length 95th (ft)				71	181	
Internal Link Dist (ft)	699			215	125	
Turn Bay Length (ft)						
Base Capacity (vph)				2802	1040	
Starvation Cap Reductn				347	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.81	0.34	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 124 (69%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 12.8 Intersection LOS: B
Intersection Capacity Utilization 109.1% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 107: NB/EB U-Turn & US 15/501 SB



UNC DP TIA 2023 — No-Build (2030) AM
108: US 15/501 NB & SB/WB U-Turn — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1972	0	0	0	0	0	0	0	77	42	0
Future Volume (vph)	0	1972	0	0	0	0	0	0	0	77	42	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected										0.950		
Satd. Flow (prot)	0	3539	0	0	0	0	0	0	0	3433	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	3539	0	0	0	0	0	0	0	3433	1863	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										53		
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1186			764			262			186	
Travel Time (s)		18.0			11.6			6.0			3.6	
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.90	0.90	0.92	0.92	0.90	0.90	0.92	0.92	0.92	0.90	0.92	0.90
Adj. Flow (vph)	0	2191	0	0	0	0	0	0	0	86	46	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2191	0	0	0	0	0	0	0	86	46	0
Turn Type		NA								Split	NA	
Protected Phases		2								4	4	
Permitted Phases												
Detector Phase		2								4	4	
Switch Phase												
Minimum Initial (s)		12.0								7.0	7.0	
Minimum Split (s)		150.0								30.0	30.0	
Total Split (s)		150.0								30.0	30.0	
Total Split (%)		83.3%								16.7%	16.7%	
Maximum Green (s)		143.8								24.0	24.0	
Yellow Time (s)		4.7								4.0	4.0	
All-Red Time (s)		1.5								2.0	2.0	
Lost Time Adjust (s)		-1.2								-1.0	0.0	
Total Lost Time (s)		5.0								5.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0								1.0	1.0	
Minimum Gap (s)		2.0								2.0	2.0	
Time Before Reduce (s)		15.0								0.0	0.0	
Time To Reduce (s)		45.0								0.0	0.0	
Recall Mode		C-Max								None	None	
Act Effct Green (s)		160.4								9.6	8.6	
Actuated g/C Ratio		0.89								0.05	0.05	
v/c Ratio		0.69								0.37	0.52	
Control Delay		4.4								37.1	101.4	
Queue Delay		0.0								0.0	0.0	
Total Delay		4.4								37.1	101.4	
LOS		A								D	F	

UNC DP TIA 2023 — No-Build (2030) AM
108: US 15/501 NB & SB/WB U-Turn — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		4.4									59.5	
Approach LOS		A									E	
Queue Length 50th (ft)		65								14	52	
Queue Length 95th (ft)		88								m41	m95	
Internal Link Dist (ft)		1106			684			182			106	
Turn Bay Length (ft)												
Base Capacity (vph)		3154								522	248	
Starvation Cap Reductn		0								0	0	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.69								0.16	0.19	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 24 (13%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 7.5 — Intersection LOS: A
Intersection Capacity Utilization 122.5% — ICU Level of Service H
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 108: US 15/501 NB & SB/WB U-Turn



UNC DP TIA 2023 — No-Build (2030) AM
109: Old Durham-CH Road/Sage Road & US 15/501 — Lanes, Volumes, Timings

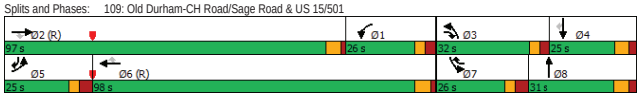
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	272	1277	107	99	1484	136	197	122	23	215	108	120
Future Volume (vph)	272	1277	107	99	1484	136	197	122	23	215	108	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	240		100	220		200	100		0	150		100
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor							1.00	1.00		1.00		0.99
Frt			0.850			0.850		0.976				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3505	1568	1752	3505	1568	1752	1795	0	3400	1845	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	3505	1568	1752	3505	1568	1746	1795	0	3387	1845	1545
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			99		4				131
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		829			1831			1573			1089	
Travel Time (s)		12.6			27.7			30.6			21.2	
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	302	1419	119	110	1649	151	219	136	26	239	120	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	302	1419	119	110	1649	151	219	162	0	239	120	133
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	25.0	89.0	25.0	20.0	65.0	25.0	25.0	25.0		25.0	25.0	25.0
Total Split (s)	25.0	97.0	32.0	26.0	98.0	26.0	32.0	31.0		26.0	25.0	25.0
Total Split (%)	13.9%	53.9%	17.8%	14.4%	54.4%	14.4%	17.8%	17.2%		14.4%	13.9%	13.9%
Maximum Green (s)	18.1	91.3	26.1	19.7	91.9	19.3	26.1	24.4		19.3	18.6	18.1
Yellow Time (s)	3.0	4.4	3.0	3.0	4.5	3.0	3.0	4.1		3.0	4.1	3.0
All-Red Time (s)	3.9	1.3	2.9	3.3	1.6	3.7	2.9	2.5		3.7	2.3	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.9	5.7	5.9	6.3	6.1	6.7	5.9	6.6		6.7	6.4	6.9
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	4.0	1.0	6.0	1.0	4.0	4.0		1.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	15.0	0.0	0.0	15.0	0.0	0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	45.0	0.0	0.0	45.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	18.2	96.2	121.2	19.7	96.7	118.6	25.2	23.0		15.8	14.6	32.3

UNC DP TIA 2023 — No-Build (2030) AM
109: Old Durham-CH Road/Sage Road & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.10	0.53	0.67	0.11	0.54	0.66	0.14	0.13		0.09	0.08	0.18
v/c Ratio	0.88	0.76	0.11	0.58	0.88	0.14	0.89	0.70		0.80	0.81	0.34
Control Delay	104.8	26.8	1.8	63.5	22.0	3.0	110.2	89.2		100.3	116.1	10.5
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	104.8	26.9	1.8	63.5	22.0	3.0	110.2	89.2		100.3	116.1	10.5
LOS	F	C	A	E	C	A	F	F		F	F	B
Approach Delay		38.1			22.8			101.3			79.9	
Approach LOS		D			C			F			E	
Queue Length 50th (ft)	175	735	3	127	923	37	257	181		145	142	2
Queue Length 95th (ft)	#263	708	14	m169	903	m22	#411	269		194	217	62
Internal Link Dist (ft)		749			1751			1493			1009	
Turn Bay Length (ft)	240		100	220		200	100			150		100
Base Capacity (vph)	354	1872	1082	191	1882	1095	254	247		364	190	391
Starvation Cap Reductn	0	22	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.85	0.77	0.11	0.58	0.88	0.14	0.86	0.66		0.66	0.63	0.34

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 100 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 160
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 41.4 — Intersection LOS: D
Intersection Capacity Utilization 86.6% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 109: Old Durham-CH Road/Sage Road & US 15/501



UNC DP TIA 2023 — No-Build (2030) AM
110: BCBS/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

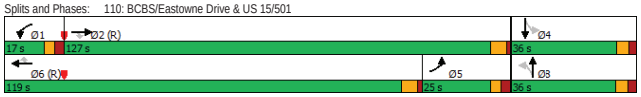
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	1407	11	41	1666	218	3	16	8	50	4	44
Future Volume (vph)	137	1407	11	41	1666	218	3	16	8	50	4	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220		100	220		250	100		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98	1.00				0.99	
Frt			0.850			0.850		0.950			0.861	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1752	0	1752	1568	0
Flt Permitted	0.950			0.950			0.722			0.740		
Satd. Flow (perm)	1752	3505	1568	1752	3505	1536	1330	1752	0	1365	1568	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			54			147		9			49	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		1831			1555			278			606	
Travel Time (s)		27.7			23.6			7.6			16.5	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	152	1563	12	46	1851	242	3	18	9	56	4	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	1563	12	46	1851	242	3	27	0	56	53	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	19.0	127.0	127.0	17.0	108.0	108.0	36.0	36.0		36.0	36.0	
Total Split (s)	25.0	127.0	127.0	17.0	119.0	119.0	36.0	36.0		36.0	36.0	
Total Split (%)	13.9%	70.6%	70.6%	9.4%	66.1%	66.1%	20.0%	20.0%		20.0%	20.0%	
Maximum Green (s)	19.2	121.3	121.3	11.2	113.1	113.1	29.9	29.9		30.1	30.1	
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.3	3.3		3.6	3.6	
All-Red Time (s)	2.8	1.1	1.1	2.8	1.3	1.3	2.8	2.8		2.3	2.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.8	5.7	5.7	5.8	5.9	5.9	6.1	6.1		5.9	5.9	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	6.0	1.0	6.0	6.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	50.0	50.0	0.0	50.0	50.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Walk Time (s)										7.0	7.0	

UNC DP TIA 2023 — No-Build (2030) AM
110: BCBS/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)										23.0	23.0	
Pedestrian Calls (#/hr)										2	2	
Act Effct Green (s)	19.2	141.4	141.4	8.7	128.1	128.1	14.9	14.9		15.1	15.1	
Actuated g/C Ratio	0.11	0.79	0.79	0.05	0.71	0.71	0.08	0.08		0.08	0.08	
v/c Ratio	0.82	0.57	0.01	0.55	0.74	0.21	0.03	0.18		0.49	0.30	
Control Delay	80.8	2.2	0.0	100.1	14.8	5.1	69.7	55.4		90.6	22.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	80.8	2.2	0.0	100.1	14.8	5.1	69.7	55.4		90.6	22.8	
LOS	F	A	A	F	B	A	E	E		F	C	
Approach Delay		9.1			15.6			56.8			57.6	
Approach LOS		A			B			E			E	
Queue Length 50th (ft)	182	70	0	54	406	31	3	20		65	5	
Queue Length 95th (ft)	m#270	170	m0	m75	427	m85	14	52		108	48	
Internal Link Dist (ft)		1751			1475			198			526	
Turn Bay Length (ft)	220		100	220		250	100					
Base Capacity (vph)	186	2753	1243	109	2494	1135	220	298		228	303	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.82	0.57	0.01	0.42	0.74	0.21	0.01	0.09		0.25	0.17	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 72 (40%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 14.2 — Intersection LOS: B
Intersection Capacity Utilization 78.3% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 110: BCBS/Eastowne Drive & US 15/501



UNC DP TIA 2023 — No-Build (2030) AM
111: Lakeview Drive/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

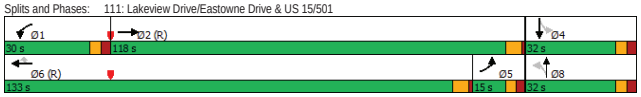
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	1460	3	90	1927	287	6	32	89	75	5	6
Future Volume (vph)	9	1460	3	90	1927	287	6	32	89	75	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		125	0		0	150		0	200		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850		0.890			0.919	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	5036	0	1752	3505	1568	1752	1642	0	1752	1695	0
Flt Permitted	0.950			0.950			0.749			0.436		
Satd. Flow (perm)	1752	5036	0	1752	3505	1568	1382	1642	0	804	1695	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						214		64			7	
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		1555			959			495			676	
Travel Time (s)		23.6			14.5			9.6			18.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	10	1622	3	100	2141	319	7	36	99	83	6	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1625	0	100	2141	319	7	135	0	83	13	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	92.0		30.0	80.0	80.0	30.0	30.0		30.0	30.0	
Total Split (s)	15.0	118.0		30.0	133.0	133.0	32.0	32.0		32.0	32.0	
Total Split (%)	8.3%	65.6%		16.7%	73.9%	73.9%	17.8%	17.8%		17.8%	17.8%	
Maximum Green (s)	9.4	112.5		24.2	127.5	127.5	25.8	25.8		25.9	25.9	
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	3.2	3.2		3.1	3.1	
All-Red Time (s)	2.6	1.0		2.8	1.0	1.0	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.5		5.8	5.5	5.5	6.2	6.2		6.1	6.1	
Lead/Lag	Lag	Lag		Lead	Lead	Lead						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0		1.0	6.0	6.0	1.0	1.0		2.0	2.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	45.0		0.0	45.0	45.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	8.0	129.4		13.7	142.9	142.9	19.4	19.4		19.5	19.5	
Actuated g/C Ratio	0.04	0.72		0.08	0.79	0.79	0.11	0.11		0.11	0.11	
v/c Ratio	0.13	0.45		0.75	0.77	0.25	0.05	0.58		0.95	0.07	
Control Delay	61.7	4.4		112.9	14.8	2.7	68.8	48.5		163.4	44.3	

UNC DP TIA 2023 — No-Build (2030) AM
111: Lakeview Drive/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	61.7	4.4		112.9	14.8	2.7	68.8	48.5		163.4	44.3	
LOS	E	A		F	B	A	E	D		F	D	
Approach Delay		4.8			17.1			49.5			147.3	
Approach LOS		A			B			D			F	
Queue Length 50th (ft)	12	68		118	523	20	8	80		99	6	
Queue Length 95th (ft)	m20	71		185	1046	71	24	154		#189	30	
Internal Link Dist (ft)		1475			879			415			596	
Turn Bay Length (ft)	150						150			200		
Base Capacity (vph)	91	3620		235	2782	1289	198	290		115	249	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.11	0.45		0.43	0.77	0.25	0.04	0.47		0.72	0.05	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 92 (51%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 16.4 — Intersection LOS: B
Intersection Capacity Utilization 91.6% — ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 111: Lakeview Drive/Eastowne Drive & US 15/501



UNC DP TIA 2023 — No-Build (2030) AM
201: Hamilton Road & NC 54 — Lanes, Volumes, Timings

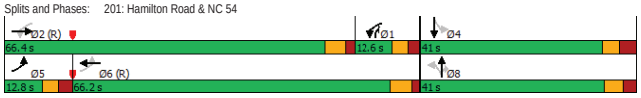
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	1763	97	42	2191	28	133	26	59	61	34	27
Future Volume (vph)	27	1763	97	42	2191	28	133	26	59	61	34	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-4%			2%			-2%	
Storage Length (ft)	200		0	200		0	0		150	100		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.98		0.98	0.99	0.99	
Frt		0.992			0.998				0.850		0.934	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	4988	0	1805	5175	0	1752	1844	1567	1787	1732	0
Flt Permitted	0.049			0.057			0.713			0.738		
Satd. Flow (perm)	90	4988	0	108	5175	0	1290	1844	1537	1379	1732	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		10			2							
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		895			935			499			486	
Travel Time (s)		13.6			14.2			9.7			9.5	
Confl. Peds. (#/hr)	3		2	2		3	19		7	7		19
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	30	1959	108	47	2434	31	148	29	66	68	38	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	2067	0	47	2465	0	148	29	66	68	68	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	6			2			8		8	4		
Detector Phase	5	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	12.6	28.7		12.4	25.9		41.0	41.0	12.4	39.6	39.6	
Total Split (s)	12.8	66.4		12.6	66.2		41.0	41.0	12.6	41.0	41.0	
Total Split (%)	10.7%	55.3%		10.5%	55.2%		34.2%	34.2%	10.5%	34.2%	34.2%	
Maximum Green (s)	7.2	60.7		7.2	60.5		34.7	34.7	7.2	34.4	34.4	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.7	3.7	3.0	3.2	3.2	
All-Red Time (s)	2.6	1.7		2.4	1.7		2.6	2.6	2.4	3.4	3.4	
Lost Time Adjust (s)	-0.6	-0.6		-0.4	-0.9		-1.4	-1.4	-0.4	-1.5	-1.5	
Total Lost Time (s)	5.0	5.1		5.0	4.8		4.9	4.9	5.0	5.1	5.1	
Lead/Lag	Lead	Lead		Lag	Lag				Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		2.0	3.0		1.0	1.0	2.0	1.0	1.0	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		16.0			13.0		27.0	27.0		26.0	26.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	88.3	78.0		87.3	84.0		18.8	18.8	29.4	18.6	18.6	
Actuated g/C Ratio	0.74	0.65		0.73	0.70		0.16	0.16	0.24	0.16	0.16	
v/c Ratio	0.18	0.64		0.20	0.68		0.73	0.10	0.17	0.32	0.25	

UNC DP TIA 2023 — No-Build (2030) AM
201: Hamilton Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	7.2	15.1		9.0	5.2		68.1	41.0	31.2	47.0	44.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	7.2	15.1		9.0	5.2		68.1	41.0	31.2	47.0	44.7	
LOS	A	B		A	A		E	D	C	D	D	
Approach Delay		15.0			5.2			54.9			45.8	
Approach LOS		B			A			D			D	
Queue Length 50th (ft)	5	384		4	85		111	20	36	47	47	
Queue Length 95th (ft)	16	442		m14	139		171	44	70	86	84	
Internal Link Dist (ft)		815			855			419			406	
Turn Bay Length (ft)	200			200					150	100		
Base Capacity (vph)	174	3245		230	3621		388	554	379	412	518	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.17	0.64		0.20	0.68		0.38	0.05	0.17	0.17	0.13	

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 55 (46%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 12.9 — Intersection LOS: B
Intersection Capacity Utilization 69.4% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 201: Hamilton Road & NC 54



UNC DP TIA 2023 — No-Build (2030) AM
202: Finley Golf Course Road/Burning Tree Lane & NC 54 — Lanes, Volumes, Timings

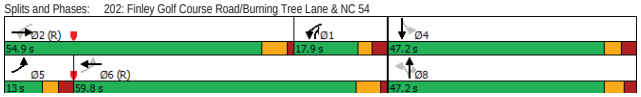
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1807	48	197	2169	25	21	5	120	26	5	37
Future Volume (vph)	22	1807	48	197	2169	25	21	5	120	26	5	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	12	12	12	10	10	10
Storage Length (ft)	200		0	100		0	460		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99	0.99		0.99	
Frt		0.996			0.998				0.850		0.927	
Flt Protected	0.950			0.950				0.962			0.981	
Satd. Flow (prot)	1770	5062	0	1770	4904	0	0	1792	1583	0	1559	0
Flt Permitted	0.044			0.063				0.684			0.862	
Satd. Flow (perm)	82	5062	0	117	4904	0	0	1264	1563	0	1370	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			2				83		41	
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		651			853			632			471	
Travel Time (s)		9.9			12.9			12.3			9.2	
Confl. Peds. (#/hr)	3		2	2		3	12		1	1		12
Confl. Bikes (#/hr)												3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	24	2008	53	219	2410	28	23	6	133	29	6	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	2061	0	219	2438	0	0	29	133	0	76	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	6			2			8		8	4		
Detector Phase	5	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	12.9	31.2		12.9	29.2		47.2	47.2	12.9	45.3	45.3	
Total Split (s)	13.0	54.9		17.9	59.8		47.2	47.2	17.9	47.2	47.2	
Total Split (%)	10.8%	45.8%		14.9%	49.8%		39.3%	39.3%	14.9%	39.3%	39.3%	
Maximum Green (s)	7.1	48.7		12.0	53.6		41.0	41.0	12.0	40.9	40.9	
Yellow Time (s)	3.0	4.9		3.0	4.9		3.7	3.7	3.0	3.2	3.2	
All-Red Time (s)	2.9	1.3		2.9	1.3		2.5	2.5	2.9	3.1	3.1	
Lost Time Adjust (s)	-0.9	-1.2		-0.9	-1.2			-1.2	-0.9		-1.3	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lead		Lag	Lag				Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0	2.0	2.0	2.0	
Minimum Gap (s)	0.2	3.0		0.2	3.0		0.2	0.2	0.2	0.2	0.2	
Time Before Reduce (s)	0.0	20.0		0.0	20.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	40.0		0.0	40.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		7.0			7.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		18.0			16.0		34.0	34.0		32.0	32.0	

UNC DP TIA 2023 — No-Build (2030) AM
202: Finley Golf Course Road/Burning Tree Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	99.6	84.7		97.6	95.9			10.0	21.3		10.0	
Actuated g/C Ratio	0.83	0.71		0.81	0.80			0.08	0.18		0.08	
v/c Ratio	0.13	0.58		0.81	0.62			0.28	0.38		0.50	
Control Delay	6.8	6.1		47.8	1.9			57.3	18.6		38.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	6.8	6.1		47.8	1.9			57.3	18.6		38.6	
LOS	A	A		D	A			E	B		D	
Approach Delay		6.1			5.7			25.5			38.6	
Approach LOS		A			A			C			D	
Queue Length 50th (ft)	0	104		118	8			22	31		26	
Queue Length 95th (ft)	m4	134		#242	99			52	82		75	
Internal Link Dist (ft)		571			773			552			391	
Turn Bay Length (ft)	200			100								
Base Capacity (vph)	180	3574		272	3918			444	347		508	
Starvation Cap Reductn	0	52		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.13	0.59		0.81	0.62			0.07	0.38		0.15	

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 62 (52%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 7.0 — Intersection LOS: A
Intersection Capacity Utilization 78.5% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 202: Finley Golf Course Road/Burning Tree Lane & NC 54



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	1650	49	67	2261	37	17	0	1	8	1	113
Future Volume (vph)	159	1650	49	67	2261	37	17	0	1	8	1	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	250		250	0		125	0		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.96	1.00		0.97						
Frt			0.850			0.850		0.850			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1583	0	1770	1585	0
Flt Permitted	0.047			0.096			0.430			0.757		
Satd. Flow (perm)	88	5085	1528	179	5085	1541	801	1583	0	1410	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			96			190		181			126	
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		853			1936			433			831	
Travel Time (s)		12.9			29.3			11.8			16.2	
Confl. Peds. (#/hr)	7		5	5		7						
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	177	1833	54	74	2512	41	19	0	1	9	1	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	177	1833	54	74	2512	41	19	1	0	9	127	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6		2	2		6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.3	27.3	27.3	13.3	18.3	18.3	13.8	13.8		14.3	14.3	
Total Split (s)	13.6	92.4	92.4	13.3	65.1	65.1	14.3	14.3		14.3	14.3	
Total Split (%)	11.3%	77.0%	77.0%	11.1%	54.3%	54.3%	11.9%	11.9%		11.9%	11.9%	
Maximum Green (s)	7.3	86.1	86.1	7.0	58.8	58.8	7.5	7.5		7.0	7.0	
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.0	3.0		3.5	3.5	
All-Red Time (s)	3.3	1.6	1.6	3.3	1.6	1.6	3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.8	-1.8		-2.3	-2.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag					Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	6.0	1.0	6.0	6.0	2.0	2.0		2.0	2.0	
Minimum Gap (s)	0.2	3.0	3.0	0.2	3.0	3.0	0.2	0.2		0.2	0.2	
Time Before Reduce (s)	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	40.0	40.0	0.0	40.0	40.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		14.0	14.0									
Pedestrian Calls (#/hr)		0	0									

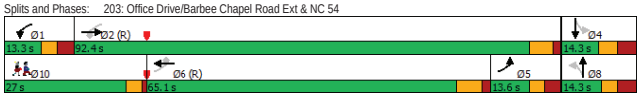
Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	27.0
Total Split (s)	27.0
Total Split (%)	23%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	95.7	90.1	90.1	96.7	87.1	87.1	9.3	9.3		9.3	9.3	
Actuated g/C Ratio	0.80	0.75	0.75	0.81	0.73	0.73	0.08	0.08		0.08	0.08	
v/c Ratio	0.93	0.48	0.05	0.29	0.68	0.04	0.31	0.00		0.08	0.53	
Control Delay	70.4	1.1	0.1	7.0	1.2	0.0	65.8	0.0		53.4	17.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	70.4	1.1	0.1	7.0	1.2	0.0	65.8	0.0		53.4	17.8	
LOS	E	A	A	A	A	A	E	A		D	B	
Approach Delay		7.0			1.4			62.5			20.2	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	90	22	0	1	24	0	14	0		7	1	
Queue Length 95th (ft)	#219	30	m0	m1	26	m0	40	0		24	61	
Internal Link Dist (ft)		773			1856			353			751	
Turn Bay Length (ft)	250		250	250		250						
Base Capacity (vph)	190	3816	1170	254	3690	1170	62	289		109	239	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.93	0.48	0.05	0.29	0.68	0.04	0.31	0.00		0.08	0.53	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 38 (32%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 4.6 — Intersection LOS: A
Intersection Capacity Utilization 72.6% — ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 203: Office Drive/Barbee Chapel Road Ext & NC 54



Lane Group	Ø10
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — No-Build (2030) AM
204: Friday Center Lane/Meadowmont Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	1484	126	434	2226	142	55	30	24	63	20	141
Future Volume (vph)	173	1484	126	434	2226	142	55	30	24	63	20	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	12	12	12	12	12	12	12	12	12
Storage Length (ft)	250		250	250		250	0		400	225		0
Storage Lanes	2		1	2		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	1.00	0.97	1.00	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	0.97	0.99	0.98	0.98		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.985		0.950		
Satd. Flow (prot)	3433	5085	1478	3433	5085	1583	1681	1743	1583	3433	1863	1583
Flt Permitted	0.950			0.950			0.950	0.985		0.950		
Satd. Flow (perm)	3431	5085	1449	3429	5085	1549	1630	1727	1554	3359	1863	1543
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			140			158			165			162
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1936			1043			1237			723	
Travel Time (s)		29.3			15.8			24.1			14.1	
Confl. Peds. (#/hr)	9		6	6		9	8		6	6		8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	192	1649	140	482	2473	158	61	33	27	70	22	157
Shared Lane Traffic (%)							24%					
Lane Group Flow (vph)	192	1649	140	482	2473	158	46	48	27	70	22	157
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2	4	1	6	3	4	4	1	3	3	5
Permitted Phases			2			6			4			3
Detector Phase	5	2	4	1	6	3	4	4	1	3	3	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.2	34.6	14.1	14.1	38.5	14.3	14.1	14.1	14.1	14.3	14.3	14.2
Total Split (s)	16.6	61.8	14.2	29.6	74.8	14.4	14.2	14.2	29.6	14.4	14.4	16.6
Total Split (%)	13.8%	51.5%	11.8%	24.7%	62.3%	12.0%	11.8%	11.8%	24.7%	12.0%	12.0%	13.8%
Maximum Green (s)	9.4	55.2	7.1	22.5	68.3	7.1	7.1	7.1	22.5	7.1	7.1	9.4
Yellow Time (s)	3.2	4.6	3.7	3.1	4.4	4.0	3.7	3.7	3.1	4.0	4.0	3.2
All-Red Time (s)	4.0	2.0	3.4	4.0	2.1	3.3	3.4	3.4	4.0	3.3	3.3	4.0
Lost Time Adjust (s)	-2.2	-1.6	-2.1	-2.1	-1.5	-2.3	-2.1	-2.1	-2.1	-2.3	-2.3	-2.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Time Before Reduce (s)	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	C-Min	None	None	C-Min	Min	None	None	None	Min	Min	Min
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		21.0			25.0							
Pedestrian Calls (#/hr)		0			0							

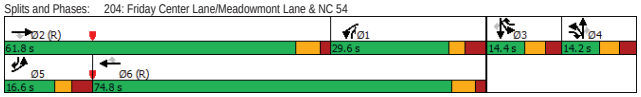
UNC DP TIA 2023 — No-Build (2030) AM
204: Friday Center Lane/Meadowmont Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	11.0	53.4	62.6	28.1	70.5	79.8	9.2	9.2	37.2	9.3	9.3	20.3
Actuated g/C Ratio	0.09	0.44	0.52	0.23	0.59	0.66	0.08	0.08	0.31	0.08	0.08	0.17
v/c Ratio	0.61	0.73	0.17	0.60	0.83	0.15	0.36	0.36	0.04	0.26	0.15	0.39
Control Delay	63.8	19.0	1.9	26.5	6.6	0.4	61.0	60.8	0.1	54.8	54.4	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.8	19.0	1.9	26.5	6.6	0.4	61.0	60.8	0.1	54.8	54.4	7.2
LOS	E	B	A	C	A	A	E	E	A	D	D	A
Approach Delay		22.2			9.4			47.4			24.7	
Approach LOS		C			A			D			C	
Queue Length 50th (ft)	64	315	5	144	144	0	35	37	0	26	16	0
Queue Length 95th (ft)	113	294	14	m162	m149	m0	77	80	0	51	44	44
Internal Link Dist (ft)		1856			963			1157			643	
Turn Bay Length (ft)	250		250	250		250			400	225		
Base Capacity (vph)	332	2406	825	803	2987	1086	128	133	603	268	145	407
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.69	0.17	0.60	0.83	0.15	0.36	0.36	0.04	0.26	0.15	0.39

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 109 (91%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 15.6 — Intersection LOS: B
Intersection Capacity Utilization 70.9% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 204: Friday Center Lane/Meadowmont Lane & NC 54



UNC DP TIA 2023 — No-Build (2030) AM
205: Barbee Chapel Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1439	222	63	2258	194	528	76	57	109	28	22
Future Volume (vph)	21	1439	222	63	2258	194	528	76	57	109	28	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		275	325		80	250		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Ped Bike Factor			0.96			0.98						
Frt			0.850			0.850		0.974			0.959	
Flt Protected	0.950			0.950			0.950	0.971		0.950	0.982	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1681	1674	0	1681	1667	0
Flt Permitted	0.068			0.076			0.950	0.971		0.950	0.982	
Satd. Flow (perm)	127	5085	1517	142	5085	1547	1681	1674	0	1681	1667	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			247			100		8			12	
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		1043			982			1263			745	
Travel Time (s)		15.8			14.9			19.1			14.5	
Confl. Peds. (#/hr)	1		7	7		1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	1599	247	70	2509	216	587	84	63	121	31	24
Shared Lane Traffic (%)							37%			27%		
Lane Group Flow (vph)	23	1599	247	70	2509	216	370	364	0	88	88	0
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	Split	NA		Split	NA	
Protected Phases	5	2	4	1	6	3	4	4		3	3	
Permitted Phases	6		2	2		6						
Detector Phase	5	2	4	1	6	3	4	4		3	3	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.8	26.5	14.2	14.0	28.5	14.2	14.2	14.2		14.2	14.2	
Total Split (s)	13.8	61.8	30.0	14.0	62.0	14.2	30.0	30.0		14.2	14.2	
Total Split (%)	11.5%	51.5%	25.0%	11.7%	51.7%	11.8%	25.0%	25.0%		11.8%	11.8%	
Maximum Green (s)	7.0	54.3	22.8	7.0	54.5	7.0	22.8	22.8		7.0	7.0	
Yellow Time (s)	3.0	4.8	4.3	3.0	4.8	3.9	4.3	4.3		3.9	3.9	
All-Red Time (s)	3.8	2.7	2.9	4.0	2.7	3.3	2.9	2.9		3.3	3.3	
Lost Time Adjust (s)	-1.8	-2.5	-2.2	-2.0	-2.5	-2.2	-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0	3.0	2.0	6.0	2.0	3.0	3.0		2.0	2.0	
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2		0.2	0.2	
Time Before Reduce (s)	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min	None	None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		12.0			14.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	67.8	57.8	82.8	66.8	62.5	71.7	25.0	25.0		9.2	9.2	

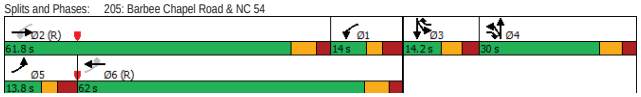
UNC DP TIA 2023 — No-Build (2030) AM
205: Barbee Chapel Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.56	0.48	0.69	0.56	0.52	0.60	0.21	0.21		0.08	0.08	
v/c Ratio	0.12	0.65	0.22	0.31	0.95	0.22	1.06	1.03		0.69	0.64	
Control Delay	3.0	7.5	0.5	30.1	37.3	6.2	109.8	100.4		80.8	67.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	3.0	7.5	0.5	30.1	37.3	6.2	109.8	100.4		80.8	67.5	
LOS	A	A	A	C	D	A	F	F		F	E	
Approach Delay		6.5			34.7			105.1			74.2	
Approach LOS		A			C			F			E	
Queue Length 50th (ft)	1	79	0	22	~768	37	~330	~311		71	61	
Queue Length 95th (ft)	m2	93	11	42	#859	74	#532	#514		#155	#137	
Internal Link Dist (ft)		963			902			1183			665	
Turn Bay Length (ft)	275		275	325		80	250					
Base Capacity (vph)	192	2525	1137	224	2649	967	350	355		128	138	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.12	0.63	0.22	0.31	0.95	0.22	1.06	1.03		0.69	0.64	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 106 (88%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 35.8 — Intersection LOS: D
Intersection Capacity Utilization 89.0% — ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 205: Barbee Chapel Road & NC 54



UNC DP TIA 2023 — No-Build (2030) AM
208: Environ Way/Rogerson Dr & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑↑				↱			↱
Traffic Volume (vph)	0	1865	69	69	2325	0	0	0	23	0	0	3
Future Volume (vph)	0	1865	69	69	2325	0	0	0	23	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-4%			0%			0%	
Storage Length (ft)	0		100	250		0	0		0	0		0
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.98
Frt			0.850						0.865			0.865
Flt Protected				0.950								
Satd. Flow (prot)	0	5085	1583	1805	5187	0	0	0	1611	0	0	1611
Flt Permitted				0.076								
Satd. Flow (perm)	0	5085	1583	144	5187	0	0	0	1611	0	0	1579
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			84						455			84
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		935			651			374			582	
Travel Time (s)		14.2			9.9			8.5			13.2	
Confl. Peds. (#/hr)	2		1	1		2	3		2	2		3
Confl. Bikes (#/hr)						1						1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2072	77	77	2583	0	0	0	26	0	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2072	77	77	2583	0	0	0	26	0	0	3
Turn Type		NA	Prot	D.P+P	NA				custom			Perm
Protected Phases		2	2	1	6							
Permitted Phases				2								4
Detector Phase		2	2	1	6							4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0							7.0
Minimum Split (s)		30.6	30.6	31.6	16.6							22.6
Total Split (s)		65.8	65.8	31.6	97.4							22.6
Total Split (%)		54.8%	54.8%	26.3%	81.2%							18.8%
Maximum Green (s)		59.2	59.2	26.0	90.8							16.0
Yellow Time (s)		4.0	4.0	3.0	4.0							4.0
All-Red Time (s)		2.6	2.6	2.6	2.6							2.6
Lost Time Adjust (s)		-1.6	-1.6	-0.6	-1.6							-1.6
Total Lost Time (s)		5.0	5.0	5.0	5.0							5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		2.0	2.0	2.0	2.0							2.0
Recall Mode		C-Max	C-Max	None	C-Min							None
Walk Time (s)		7.0	7.0	7.0								7.0
Flash Dont Walk (s)		17.0	17.0	19.0								9.0
Pedestrian Calls (#/hr)		0	0	0								0
Act Effct Green (s)		102.7	102.7	108.3	116.3				0.0			8.6
Actuated g/C Ratio		0.86	0.86	0.90	0.97				0.00			0.07

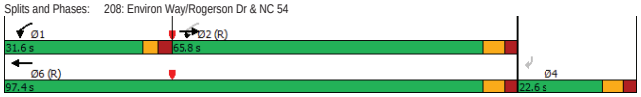
UNC DP TIA 2023 — No-Build (2030) AM
208: Environ Way/Rogerson Dr & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.48	0.06	0.32	0.51				0.06			0.02
Control Delay		1.2	0.1	11.7	0.4				0.3			0.0
Queue Delay		0.0	0.0	0.0	0.0				0.0			0.0
Total Delay		1.2	0.1	11.7	0.4				0.3			0.0
LOS		A	A	B	A				A			A
Approach Delay		1.2			0.7			0.3				
Approach LOS		A			A			A				
Queue Length 50th (ft)		16	0	1	0				0			0
Queue Length 95th (ft)		76	m0	m33	24				0			0
Internal Link Dist (ft)		855			571			294			502	
Turn Bay Length (ft)			100	250								
Base Capacity (vph)		4353	1367	503	5026				455			303
Starvation Cap Reductn		0	0	0	39				0			0
Spillback Cap Reductn		0	0	0	0				0			0
Storage Cap Reductn		0	0	0	0				0			0
Reduced v/c Ratio		0.48	0.06	0.15	0.52				0.06			0.01

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 50 (42%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 0.9 — Intersection LOS: A
Intersection Capacity Utilization 59.8% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 208: Environ Way/Rogerson Dr & NC 54



UNC DP TIA 2023 — No-Build (2030) AM
301: Columbia Street & Culbreth Road/Mt Carmel Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱		↰	↰↰	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (vph)	210	88	45	20	84	585	48	1455	4	317	840	203
Future Volume (vph)	210	88	45	20	84	585	48	1455	4	317	840	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	200		115	380		415	100		95	491		207
Storage Lanes	1		1	0		2	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98		1.00				0.98			
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950				0.991		0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	0	1920	2898	1787	3575	1599	1752	3504	1567
Flt Permitted	0.950				0.221		0.203			0.062		
Satd. Flow (perm)	1743	1835	1530	0	428	2898	382	3575	1566	114	3504	1567
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			113			422			115			226
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		950			859			2346			550	
Travel Time (s)		18.5			16.7			45.7			10.7	
Confl. Peds. (#/hr)			1	1			2					2
Confl. Bikes (#/hr)			2			2			1			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	233	98	50	22	93	650	53	1617	4	352	933	226
Shared Lane Traffic (%)												
Lane Group Flow (vph)	233	98	50	0	115	650	53	1617	4	352	933	226
Turn Type	custom	NA	Perm	Perm	NA	Prot	Perm	NA	Perm	pm+pt	NA	Prot
Protected Phases	4	4			3	3		2		1	6	6
Permitted Phases	4		4	3			2		2	6		
Detector Phase	4	4	4	3	3	3	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	12.0	7.0	12.0	12.0
Minimum Split (s)	13.5	13.5	13.5	13.9	13.9	13.9	18.2	18.2	18.2	12.1	25.2	25.2
Total Split (s)	23.0	23.0	23.0	38.0	38.0	38.0	64.0	64.0	64.0	25.0	89.0	89.0
Total Split (%)	15.3%	15.3%	15.3%	25.3%	25.3%	25.3%	42.7%	42.7%	42.7%	16.7%	59.3%	59.3%
Maximum Green (s)	16.6	16.6	16.6	31.1	31.1	31.1	57.8	57.8	57.8	19.9	83.5	83.5
Yellow Time (s)	4.2	4.2	4.2	4.5	4.5	4.5	4.7	4.7	4.7	3.0	4.3	4.3
All-Red Time (s)	2.2	2.2	2.2	2.4	2.4	2.4	1.5	1.5	1.5	2.1	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4		6.9	6.9	6.2	6.2	6.2	5.1	5.5	5.5
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	6.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	15.0	0.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0	45.0	0.0	45.0	45.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)											7.0	7.0
Flash Dont Walk (s)											12.0	12.0

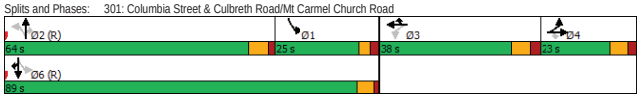
UNC DP TIA 2023 — No-Build (2030) AM
301: Columbia Street & Culbreth Road/Mt Carmel Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)											0	0
Act Effct Green (s)	16.6	16.6	16.6		31.1	31.1	57.8	57.8	57.8	83.9	83.5	83.5
Actuated g/C Ratio	0.11	0.11	0.11		0.21	0.21	0.39	0.39	0.39	0.56	0.56	0.56
v/c Ratio	1.21	0.48	0.19		1.31	0.70	0.36	1.17	0.01	1.25	0.48	0.23
Control Delay	187.7	71.3	1.5		243.8	22.9	29.9	119.3	0.0	179.4	12.7	1.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	187.7	71.3	1.5		243.8	22.9	29.9	119.3	0.0	179.4	12.7	1.2
LOS	F	E	A		F	C	C	F	A	F	B	A
Approach Delay		133.3			56.1			116.2			49.8	
Approach LOS		F			E			F			D	
Queue Length 50th (ft)	~277	92	0		~143	118	35	~1000	0	~394	192	6
Queue Length 95th (ft)	#454	155	0		#277	197	m63	#1118	m0	#597	188	14
Internal Link Dist (ft)		870			779			2266			470	
Turn Bay Length (ft)	200		115			415	100		95	491		207
Base Capacity (vph)	192	203	269		88	935	147	1377	674	281	1950	972
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.21	0.48	0.19		1.31	0.70	0.36	1.17	0.01	1.25	0.48	0.23

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 118 (79%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.31
Intersection Signal Delay: 83.9 — Intersection LOS: F
Intersection Capacity Utilization 90.8% — ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 301: Columbia Street & Culbreth Road/Mt Carmel Church Road



UNC DP TIA 2023 — No-Build (2030) AM
302: Columbia Street & Arlen Park Drive/Bennett Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	19	6	64	18	7	4	1362	86	64	833	61
Future Volume (vph)	88	19	6	64	18	7	4	1362	86	64	833	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	350		350	350		350
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00		1.00	1.00		1.00		0.98	1.00		0.98
Frt		0.962			0.957				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1786	0	1770	1776	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.739			0.739			0.950			0.950		
Satd. Flow (perm)	1377	1786	0	1375	1776	0	1767	3539	1547	1767	3539	1545
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			8				96			78
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		358			1313			2727			2346	
Travel Time (s)		9.8			25.6			53.1			45.7	
Confl. Peds. (#/hr)			1	1			1		2	2		1
Confl. Bikes (#/hr)						1			2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	98	21	7	71	20	8	4	1513	96	71	926	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	28	0	71	28	0	4	1513	96	71	926	68
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	36.6	36.6		14.1	14.1		13.6	20.6	20.6	12.9	24.6	24.6
Total Split (s)	38.0	38.0		38.0	38.0		14.0	93.0	93.0	19.0	98.0	98.0
Total Split (%)	25.3%	25.3%		25.3%	25.3%		9.3%	62.0%	62.0%	12.7%	65.3%	65.3%
Maximum Green (s)	31.4	31.4		30.9	30.9		7.4	86.4	86.4	13.1	91.4	91.4
Yellow Time (s)	3.2	3.2		3.8	3.8		3.0	4.6	4.6	3.0	4.6	4.6
All-Red Time (s)	3.4	3.4		3.3	3.3		3.6	2.0	2.0	2.9	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		7.1	7.1		6.6	6.6	6.6	5.9	6.6	6.6
Lead/Lag							Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		1.0	1.0		2.0	6.0	6.0	1.0	6.0	6.0
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	25.0	25.0	0.0	25.0	25.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	55.0	55.0	0.0	55.0	55.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	4.0	4.0									7.0	7.0
Flash Dont Walk (s)	26.0	26.0									10.0	10.0
Pedestrian Calls (#/hr)	0	0									0	0

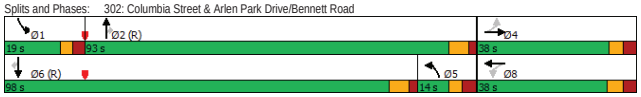
UNC DP TIA 2023 — No-Build (2030) AM
302: Columbia Street & Arlen Park Drive/Bennett Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	15.1	15.1		14.6	14.6		7.1	106.0	106.0	9.8	118.9	118.9
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.05	0.71	0.71	0.07	0.79	0.79
v/c Ratio	0.71	0.15		0.53	0.16		0.05	0.61	0.09	0.61	0.33	0.05
Control Delay	90.9	49.0		77.6	47.8		65.8	10.6	0.5	105.6	1.3	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.9	49.0		77.6	47.8		65.8	10.6	0.5	105.6	1.3	0.1
LOS	F	D		E	D		E	B	A	F	A	A
Approach Delay		81.6			69.2			10.2			8.1	
Approach LOS		F			E			B			A	
Queue Length 50th (ft)	94	19		67	18		4	375	0	63	8	0
Queue Length 95th (ft)	154	50		117	49		m8	523	3	m101	m23	m0
Internal Link Dist (ft)		278			1233			2647			2266	
Turn Bay Length (ft)	150			150			350		350	350		350
Base Capacity (vph)	288	379		283	372		87	2500	1121	156	2805	1240
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.07		0.25	0.08		0.05	0.61	0.09	0.46	0.33	0.05

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 46 (31%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 14.5 — Intersection LOS: B
Intersection Capacity Utilization 71.4% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 302: Columbia Street & Arlen Park Drive/Bennett Road



No-Build (2030) AM.syn VHB

UNC DP TIA 2023 — No-Build (2030) AM
303: Columbia Street & Market Street — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	212	42	181	1136	6	577	370
Future Volume (vph)	212	42	181	1136	6	577	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0	350		250		350
Storage Lanes	1	1	1		1		1
Taper Length (ft)	25		25		25		
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Frt		0.850					0.850
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1770	1583	1770	3539	1770	3539	1583
Flt Permitted	0.950		0.950		0.221		
Satd. Flow (perm)	1770	1583	1770	3539	412	3539	1583
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		47					411
Link Speed (mph)	25			35		35	
Link Distance (ft)	416			1017		2727	
Travel Time (s)	11.3			19.8		53.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	236	47	201	1262	7	641	411
Shared Lane Traffic (%)							
Lane Group Flow (vph)	236	47	201	1262	7	641	411
Turn Type	Prot	Perm	Prot	NA	Perm	NA	Perm
Protected Phases	4		5	2		6	
Permitted Phases		4			6		6
Detector Phase	4	4	5	2	6	6	6
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	12.0
Minimum Split (s)	14.1	14.1	12.8	20.4	20.0	20.0	20.0
Total Split (s)	25.0	25.0	22.0	50.0	28.0	28.0	28.0
Total Split (%)	33.3%	33.3%	29.3%	66.7%	37.3%	37.3%	37.3%
Maximum Green (s)	18.9	18.9	16.2	43.6	22.0	22.0	22.0
Yellow Time (s)	3.0	3.0	3.0	5.0	4.6	4.6	4.6
All-Red Time (s)	3.1	3.1	2.8	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	5.8	6.4	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	1.0	6.0	6.0	6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	45.0	45.0	45.0	45.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	14.8	14.8	11.8	47.7	30.5	30.5	30.5
Actuated g/C Ratio	0.20	0.20	0.16	0.64	0.41	0.41	0.41
v/c Ratio	0.68	0.13	0.73	0.56	0.04	0.44	0.46
Control Delay	37.5	8.4	44.6	9.5	15.8	16.3	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	8.4	44.6	9.5	15.8	16.3	6.1

No-Build (2030) AM.syn VHB

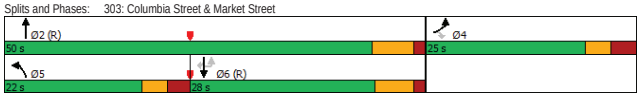
UNC DP TIA 2023 — No-Build (2030) AM
303: Columbia Street & Market Street — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
LOS	D	A	D	A	B	B	A
Approach Delay	32.7			14.3		12.3	
Approach LOS	C			B		B	
Queue Length 50th (ft)	102	0	90	154	3	136	39
Queue Length 95th (ft)	163	24	147	242	m9	181	84
Internal Link Dist (ft)	336			937		2647	
Turn Bay Length (ft)	150		350		250		350
Base Capacity (vph)	446	434	382	2251	167	1441	888
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.11	0.53	0.56	0.04	0.44	0.46

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 74 (99%), Referenced to phase 2:NBT and 6:SBTU, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 15.4 — Intersection LOS: B
Intersection Capacity Utilization 68.6% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 303: Columbia Street & Market Street



No-Build (2030) AM.syn VHB

UNC DP TIA 2023 — No-Build (2030) AM
305: Boundary Street & Park Place — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	34	3	31	6	4	86
Future Volume (vph)	34	3	31	6	4	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.990		0.977			
Flt Protected	0.956					0.998
Satd. Flow (prot)	1763	0	1820	0	0	1859
Flt Permitted	0.956					0.998
Satd. Flow (perm)	1763	0	1820	0	0	1859
Link Speed (mph)	25		25			25
Link Distance (ft)	398		535			551
Travel Time (s)	10.9		14.6			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	38	3	34	7	4	96
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	0	41	0	0	100
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 17.8%		ICU Level of Service A	
Analysis Period (min) 15			

UNC DP TIA 2023 — No-Build (2030) AM
305: Boundary Street & Park Place — HCM 2010 TWSC

Intersection

Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	3	31	6	4	86
Future Vol, veh/h	34	3	31	6	4	86
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	3	34	7	4	96

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	142	38	0	0	41	0
Stage 1	38	-	-	-	-	-
Stage 2	104	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	851	1034	-	-	1568	-
Stage 1	984	-	-	-	-	-
Stage 2	920	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	848	1034	-	-	1568	-
Mov Cap-2 Maneuver	848	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	917	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	861	1568	-
HCM Lane V/C Ratio	-	-	0.048	0.003	-
HCM Control Delay (s)	-	-	9.4	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

UNC DP TIA 2023 — No-Build (2030) AM
307: Country Club Road & Boundary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	365	386	0	0	57
Future Volume (vph)	0	365	386	0	0	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	0	1611
Link Speed (mph)		25	25		30	
Link Distance (ft)		312	90		92	
Travel Time (s)		8.5	2.5		2.1	
Confl. Peds. (#/hr)						9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	406	429	0	0	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	406	429	0	0	63
Sign Control		Free	Free		Yield	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.7%		ICU Level of Service A	
Analysis Period (min) 15			

UNC DP TIA 2023 — No-Build (2030) AM
313: Ridge Road & Country Club Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	165	502	5	21	137	36
Future Volume (vph)	165	502	5	21	137	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.898				0.972	
Flt Protected				0.990	0.962	
Satd. Flow (prot)	1673	0	0	1844	1742	0
Flt Permitted				0.990	0.962	
Satd. Flow (perm)	1673	0	0	1844	1742	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	215			564	517	
Travel Time (s)	4.2			11.0	10.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	183	558	6	23	152	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	741	0	0	29	192	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 56.0%		ICU Level of Service B	
Analysis Period (min) 15			

UNC DP TIA 2023 — No-Build (2030) AM
313: Ridge Road & Country Club Road — HCM 2010 TWSC

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	165	502	5	21	137	36
Future Vol, veh/h	165	502	5	21	137	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	183	558	6	23	152	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	741	0	497	462
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	35	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	866	-	532	600
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	987	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	866	-	528	600
Mov Cap-2 Maneuver	-	-	-	-	528	-
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	980	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	15.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	542	-	-	866	-
HCM Lane V/C Ratio	0.355	-	-	0.006	-
HCM Control Delay (s)	15.2	-	-	9.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.6	-	-	0	-

UNC DP TIA 2023 — No-Build (2030) AM
325: Columbia Street & Pittsboro Street — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	340	0	658	61	0
Future Volume (vph)	0	340	0	658	61	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			0%	4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	1825	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	1825	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	384			956	267	
Travel Time (s)	8.7			26.1	7.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	378	0	731	68	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	378	0	731	68	0
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	38.0%	ICU Level of Service A	
Analysis Period (min)	15		

UNC DP TIA 2023 — No-Build (2030) AM
329: Pittsboro Street & Manning Drive — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	442	340
Future Volume (vph)	0	0	0	0	442	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt						
Flt Protected					0.950	0.993
Satd. Flow (prot)	0	0	0	0	1681	1757
Flt Permitted					0.950	0.993
Satd. Flow (perm)	0	0	0	0	1681	1757
Link Speed (mph)	25		30			25
Link Distance (ft)	218		384			1147
Travel Time (s)	5.9		8.7			31.3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	491	378
Shared Lane Traffic (%)					13%	
Lane Group Flow (vph)	0	0	0	0	427	442
Sign Control	Free		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	24.5%	ICU Level of Service A	
Analysis Period (min)	15		

UNC DP TIA 2023 — No-Build (2030) AM
350: Fordham Blvd & Oteys Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2543	1371	40	0	17
Future Volume (vph)	0	2543	1371	40	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	10	10
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.996			0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3525	0	0	1504
Flt Permitted						
Satd. Flow (perm)	0	3539	3525	0	0	1504
Link Speed (mph)		45	45		25	
Link Distance (ft)		2437	1661		324	
Travel Time (s)		36.9	25.2		8.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2826	1523	44	0	19
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2826	1567	0	0	19
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	73.6%	ICU Level of Service D	
Analysis Period (min)	15		

UNC DP TIA 2023 — No-Build (2030) AM
350: Fordham Blvd & Oteys Road — HCM 2010 TWSC

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Vol, veh/h	0	2543	1371	40	0	17
Future Vol, veh/h	0	2543	1371	40	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2826	1523	44	0	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	784
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	336
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	336
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	336
HCM Lane V/C Ratio	-	-	-	0.056
HCM Control Delay (s)	-	-	-	16.4
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.2

UNC DP TIA 2023 — No-Build (2030) AM
357: Fordham Blvd & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Volume (vph)	0	2155	750	0	0	293
Future Volume (vph)	0	2155	750	0	0	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3539	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	0	0	1611
Link Speed (mph)		45	45		25	
Link Distance (ft)		1088	445		1226	
Travel Time (s)		16.5	6.7		33.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2394	833	0	0	326
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2394	833	0	0	326
Sign Control		Free	Free		Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 62.9%		ICU Level of Service B	
Analysis Period (min) 15			

UNC DP TIA 2023 — No-Build (2030) AM
358: NC 54 EB Ramps & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Traffic Volume (vph)	1513	718	0	777	0	0
Future Volume (vph)	1513	718	0	777	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.952					
Flt Protected						
Satd. Flow (prot)	3369	0	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	3369	0	0	3539	0	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	445			1758	975	
Travel Time (s)	6.7			26.6	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1681	798	0	863	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2479	0	0	863	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 117.8%		ICU Level of Service H	
Analysis Period (min) 15			

UNC DP TIA 2023 — No-Build (2030) AM
359: Columbia Street & NC 54 EB Ramps — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑			↑↑
Traffic Volume (vph)	0	0	974	1052	0	1242
Future Volume (vph)	0	0	974	1052	0	1242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt			0.922			
Flt Protected						
Satd. Flow (prot)	0	0	3263	0	0	3539
Flt Permitted						
Satd. Flow (perm)	0	0	3263	0	0	3539
Link Speed (mph)	35		25			25
Link Distance (ft)	424		550			219
Travel Time (s)	8.3		15.0			6.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	1082	1169	0	1380
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	2251	0	0	1380
Sign Control	Free		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 64.1%		ICU Level of Service C	
Analysis Period (min) 15			

UNC DP TIA 2023 — No-Build (2030) AM
360: NC 54 EB Ramps & Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	68	0	0	1052	0	0
Future Volume (vph)	68	0	0	1052	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	1863	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	1863	0	0
Link Speed (mph)	30			35	30	
Link Distance (ft)	270			424	706	
Travel Time (s)	6.1			8.3	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	0	0	1169	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	76	0	0	1169	0	0
Sign Control	Free			Yield	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 65.8% — ICU Level of Service C
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
361: NC 54 EB Ramps & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1513	0	0	777	0	1120
Future Volume (vph)	1513	0	0	777	0	1120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1611
Link Speed (mph)	45			45	30	
Link Distance (ft)	1758			301	706	
Travel Time (s)	26.6			4.6	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1681	0	0	863	0	1244
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1681	0	0	863	0	1244
Sign Control	Free			Free	Yield	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 117.8% — ICU Level of Service H
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
362: Fordham Blvd & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2633	777	660	0	0
Future Volume (vph)	0	2633	777	660	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			250	0	0
Storage Lanes	0			1	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3539	3539	1583	0	0
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	1583	0	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		301	2437		1188	
Travel Time (s)		4.6	36.9		32.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2926	863	733	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2926	863	733	0	0
Sign Control		Free	Free		Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 76.1% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
1051: US 15/501 NB & NB/EB U-Turn — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	325	1840	0	0	0	0
Future Volume (vph)	325	1840	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	3400	3505	0	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3400	3505	0	0	0	0
Link Speed (mph)		30	45		30	
Link Distance (ft)		605	492		205	
Travel Time (s)		13.8	7.5		4.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	361	2044	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	361	2044	0	0	0	0
Sign Control		Free	Free		Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 109.1% — ICU Level of Service H
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
1052: SB/WB U-Turn & US 15/501 SB — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	80	2189	0	0
Future Volume (vph)	0	0	80	2189	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	250		0	0
Storage Lanes		0	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00
Frt						
Flt Protected			0.950			
Satd. Flow (prot)	0	0	3433	3539	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	3433	3539	0	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	1322			777	186	
Travel Time (s)	20.0			11.8	4.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	89	2432	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	89	2432	0	0
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 78.3% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
5001: US 15/501/US 15/501 SB & US 15/501 NB — Lanes, Volumes, Timings

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	0	1128	0	1145	0	0
Future Volume (vph)	0	1128	0	1145	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	0	2787	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	0	2787	0	3539	0	0
Link Speed (mph)	45			45	45	
Link Distance (ft)	811			1322	1186	
Travel Time (s)	12.3			20.0	18.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1253	0	1272	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1253	0	1272	0	0
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 42.8% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) AM
5002: US 15/501 SB/US 15/501 — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1846	0	1840
Future Volume (vph)	0	0	0	1846	0	1840
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.88
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	0	2787
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	0	2787
Link Speed (mph)	45			45	45	
Link Distance (ft)	295			829	492	
Travel Time (s)	4.5			12.6	7.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	2051	0	2044
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	2051	0	2044
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 67.7% — ICU Level of Service C
Analysis Period (min) 15

INTERSECTION LEVEL OF SERVICE WORKSHEETS
NO-BUILD (2030) PM

UNC DP TIA 2023 — No-Build (2030) PM
1: Columbia Street & Rosemary Street — Lanes, Volumes, Timings

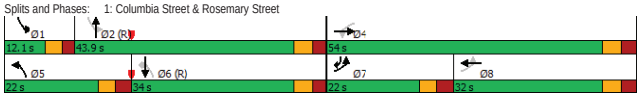
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	13	155	23	9	25	159	459	29	19	342	189
Future Volume (vph)	195	13	155	23	9	25	159	459	29	19	342	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	0		0	0		0	125		0	0		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			50			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.94	0.92		0.94	0.95		0.81	0.97		0.85		0.60
Frt		0.861			0.889			0.991				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1433	1324	0	1486	1318	0	1433	2726	0	1433	2867	1378
Flt Permitted	0.732			0.611			0.476			0.378		
Satd. Flow (perm)	1043	1324	0	901	1318	0	578	2726	0	486	2867	833
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		172			28			6				210
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		783			945			370			503	
Travel Time (s)		21.4			25.8			10.1			13.7	
Confl. Peds. (#/hr)	46		59	59		46	111		129	129		111
Confl. Bikes (#/hr)			2			2			15			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)								0				
Adj. Flow (vph)	217	14	172	26	10	28	177	510	32	21	380	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	217	186	0	26	38	0	177	542	0	21	380	210
Turn Type	D.P+P	NA		D.Pm	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		4	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.8	31.0		31.0	32.0		12.8	22.8		12.1	21.8	12.8
Total Split (s)	22.0	54.0		54.0	32.0		22.0	43.9		12.1	34.0	22.0
Total Split (%)	20.0%	49.1%		49.1%	29.1%		20.0%	39.9%		11.0%	30.9%	20.0%
Maximum Green (s)	16.2	48.0		48.0	26.0		16.2	38.1		7.0	28.2	16.2
Yellow Time (s)	3.0	3.2		3.2	3.2		3.0	3.3		3.0	3.3	3.0
All-Red Time (s)	2.8	2.8		2.8	2.8		2.8	2.5		2.1	2.5	2.8
Lost Time Adjust (s)	-0.8	-0.8		-1.0	-1.0		-0.8	-0.8		0.1	0.1	-0.8
Total Lost Time (s)	5.0	5.2		5.0	5.0		5.0	5.0		5.2	5.9	5.0
Lead/Lag	Lead				Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Recall Mode	None	Ped		Ped	Ped		None	C-Max		None	C-Max	None
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)		18.0		18.0	19.0			10.0			9.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	41.5	46.3		46.5	27.0		48.5	48.6		51.2	35.2	50.6

UNC DP TIA 2023 — No-Build (2030) PM
1: Columbia Street & Rosemary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.38	0.42		0.42	0.25		0.44	0.44		0.47	0.32	0.46
v/c Ratio	0.49	0.28		0.07	0.11		0.50	0.45		0.07	0.41	0.37
Control Delay	25.5	4.7		18.5	16.1		13.7	17.0		16.7	32.6	4.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.7		0.0	0.0	0.0
Total Delay	25.5	4.7		18.5	16.1		13.7	17.7		16.7	32.6	4.4
LOS	C	A		B	B		B	B		B	C	A
Approach Delay		15.9			17.1			16.7			22.4	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)	100	6		11	5		64	113		8	111	0
Queue Length 95th (ft)	158	46		28	32		m84	m200		22	170	40
Internal Link Dist (ft)		703			865			290			423	
Turn Bay Length (ft)							125					
Base Capacity (vph)	473	683		401	344		404	1208		285	916	594
Starvation Cap Reductn	0	0		0	0		0	354		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.46	0.27		0.06	0.11		0.44	0.63		0.07	0.41	0.35

Intersection Summary
Area Type: CBD
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 9 (8%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.50
Intersection Signal Delay: 18.5 — Intersection LOS: B
Intersection Capacity Utilization 63.2% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Columbia Street & Rosemary Street



UNC DP TIA 2023 — No-Build (2030) PM
2: Columbia Street & Franklin Street — Lanes, Volumes, Timings

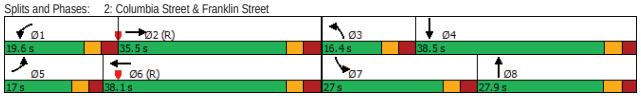
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	463	69	130	429	211	57	299	105	229	239	69
Future Volume (vph)	118	463	69	130	429	211	57	299	105	229	239	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	0		0	250		0	600		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.87	0.95		0.85	0.89		0.82	0.91		0.82	0.93	
Frt		0.980			0.951			0.961			0.966	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1433	2980	0	1486	2504	0	1433	2600	0	1433	2582	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1252	2980	0	1263	2504	0	1172	2600	0	1178	2582	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			78			41			35	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		795			952			972			370	
Travel Time (s)		21.7			26.0			26.5			10.1	
Confl. Peds. (#/hr)	331		338	338		331	196		308	308		196
Confl. Bikes (#/hr)			4			9			17			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	131	514	77	144	477	234	63	332	117	254	266	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	131	591	0	144	711	0	63	449	0	254	343	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.4	28.2		12.9	28.2		12.9	27.9		12.9	27.7	
Total Split (s)	17.0	35.5		19.6	38.1		16.4	27.9		27.0	38.5	
Total Split (%)	15.5%	32.3%		17.8%	34.6%		14.9%	25.4%		24.5%	35.0%	
Maximum Green (s)	11.6	29.3		13.7	31.9		10.5	22.0		21.1	32.8	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.3		3.0	3.1	
All-Red Time (s)	2.4	3.2		2.9	3.2		2.9	2.6		2.9	2.6	
Lost Time Adjust (s)	-0.4	-1.2		-0.9	-1.2		-0.9	-0.9		-0.9	-0.7	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	Ped		None	Ped	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	11.4	32.8		13.2	34.6		9.5	22.9		21.1	37.1	
Actuated g/C Ratio	0.10	0.30		0.12	0.31		0.09	0.21		0.19	0.34	

UNC DP TIA 2023 — No-Build (2030) PM
2: Columbia Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.88	0.66		0.81	0.85		0.51	0.78		0.93	0.38	
Control Delay	97.1	37.6		67.6	30.6		62.5	48.2		68.1	26.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	97.1	37.6		67.6	30.6		62.5	48.2		68.1	26.6	
LOS	F	D		E	C		E	D		E	C	
Approach Delay		48.4			36.8			49.9			44.3	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	92	192		103	159		43	145		180	112	
Queue Length 95th (ft)	#202	257		m126	m#266		87	#211		#327	163	
Internal Link Dist (ft)		715			872			892			290	
Turn Bay Length (ft)				250			600			125		
Base Capacity (vph)	156	900		197	840		148	573		286	893	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.84	0.66		0.73	0.85		0.43	0.78		0.89	0.38	

Intersection Summary
Area Type: CBD
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 108 (98%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 44.1 — Intersection LOS: D
Intersection Capacity Utilization 80.0% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Columbia Street & Franklin Street



UNC DP TIA 2023 — No-Build (2030) PM
3: Raleigh Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	570	212	47	612	262	124	289	60	139	254	26
Future Volume (vph)	37	570	212	47	612	262	124	289	60	139	254	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	10	9	10	11	12	12	12	10	10	10
Storage Length (ft)	100		0	100		0	0		0	150		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.97		0.98	0.95			0.98		0.99	0.99	
Frt		0.959			0.955			0.983			0.986	
Flt Protected	0.950			0.950				0.987		0.950		
Satd. Flow (prot)	1433	2671	0	1433	2691	0	0	1617	0	1486	1527	0
Flt Permitted	0.198			0.211				0.831		0.435		
Satd. Flow (perm)	292	2671	0	313	2691	0	0	1345	0	672	1527	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		114			141			18			10	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1179			1100			994			364	
Travel Time (s)		32.2			30.0			27.1			9.9	
Confl. Peds. (#/hr)	57		29	29		57	95		34	34		95
Confl. Bikes (#/hr)			7									1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	41	633	236	52	680	291	138	321	67	154	282	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	869	0	52	971	0	0	526	0	154	311	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		D.Pm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		6	6		7	4		4	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	19.8	19.8		19.8	19.8		8.0	20.0		20.0	20.0	
Total Split (s)	26.0	26.0		26.0	26.0		8.0	29.0		29.0	21.0	
Total Split (%)	47.3%	47.3%		47.3%	47.3%		14.5%	52.7%		52.7%	38.2%	
Maximum Green (s)	21.2	21.2		21.2	21.2		4.0	25.0		25.0	17.0	
Yellow Time (s)	3.3	3.3		3.1	3.1		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.7	1.7		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	-0.1	-0.1		-0.1	-0.1			-0.6		-1.2	-1.2	
Total Lost Time (s)	4.7	4.7		4.7	4.7			3.4		2.8	2.8	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)	4.0	4.0		4.0	4.0			5.0		5.0	5.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)	20.2	20.2		20.2	20.2			26.7		27.3	27.3	
Actuated g/C Ratio	0.37	0.37		0.37	0.37			0.49		0.50	0.50	

UNC DP TIA 2023 — No-Build (2030) PM
3: Raleigh Street & Franklin Street — Lanes, Volumes, Timings

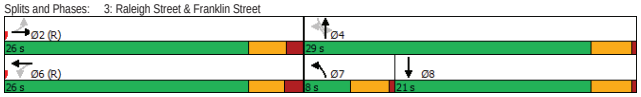
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.38	0.82		0.45	0.90			0.80		0.46	0.41	
Control Delay	15.2	14.2		22.4	22.9			24.2		15.5	11.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	15.2	14.2		22.4	22.9			24.2		15.5	11.0	
LOS	B	B		C	C			C		B	B	
Approach Delay		14.3			22.8			24.2			12.5	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	10	101		12	127			135		32	59	
Queue Length 95th (ft)	m17	m148		m24	#239			#304		79	112	
Internal Link Dist (ft)		1099			1020			914			284	
Turn Bay Length (ft)	100			100						150		
Base Capacity (vph)	113	1104		121	1128			661		333	761	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.36	0.79		0.43	0.86			0.80		0.46	0.41	

Intersection Summary

Area Type: CBD
Cycle Length: 55
Actuated Cycle Length: 55
Offset: 4 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 18.8 — Intersection LOS: B
Intersection Capacity Utilization 98.3% — ICU Level of Service F
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Raleigh Street & Franklin Street



No-Build (2030) PM.syn VHB

UNC DP TIA 2023 — No-Build (2030) PM
4: Merritt Mill Road & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lane Configurations							
Traffic Volume (vph)	316	194	142	170	67	286	
Future Volume (vph)	316	194	142	170	67	286	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	14	15	15	9	12	
Storage Length (ft)	0	250		0	25		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	0.93	0.77	0.99				
Frt		0.850	0.926				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1699	1520	1688	0	1433	1676	
Flt Permitted	0.950				0.404		
Satd. Flow (perm)	1576	1172	1688	0	610	1676	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		216	63				
Link Speed (mph)	25		25			25	
Link Distance (ft)	1645		945			1000	
Travel Time (s)	44.9		25.8			27.3	
Confl. Peds. (#/hr)	35	50					
Confl. Bikes (#/hr)		121		1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	351	216	158	189	74	318	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	351	216	347	0	74	318	
Turn Type	Prot	pm+ov	NA		D.P+P	NA	
Protected Phases	3	1	2		1	6	4
Permitted Phases		3			2		
Detector Phase	3	1	2		1	6	
Switch Phase							
Minimum Initial (s)	7.0	7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.1	11.6	14.9		11.6	14.9	25.0
Total Split (s)	27.0	11.8	26.2		11.8	38.0	25.0
Total Split (%)	30.0%	13.1%	29.1%		13.1%	42.2%	28%
Maximum Green (s)	21.9	7.2	21.3		7.2	33.1	22.0
Yellow Time (s)	3.0	3.0	3.1		3.0	3.1	3.0
All-Red Time (s)	2.1	1.6	1.8		1.6	1.8	0.0
Lost Time Adjust (s)	0.1	0.4	0.1		0.4	0.4	
Total Lost Time (s)	5.2	5.0	5.0		5.0	5.3	
Lead/Lag	Lead	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Vehicle Extension (s)	1.0	2.0	3.0		2.0	3.0	0.2
Recall Mode	None	None	Min		None	Min	None
Walk Time (s)							7.0
Flash Dont Walk (s)							15.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	16.3	23.3	15.6		22.4	27.2	
Actuated g/C Ratio	0.30	0.43	0.29		0.41	0.50	

No-Build (2030) PM.syn VHB

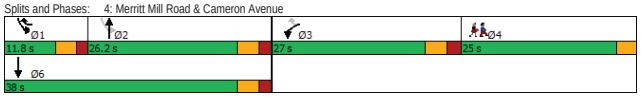
UNC DP TIA 2023 — No-Build (2030) PM
4: Merritt Mill Road & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
v/c Ratio	0.69	0.32	0.66		0.21	0.38	
Control Delay	25.2	2.9	20.9		9.6	10.6	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	25.2	2.9	20.9		9.6	10.6	
LOS	C	A	C		A	B	
Approach Delay	16.7		20.9			10.4	
Approach LOS	B		C			B	
Queue Length 50th (ft)	98	0	79		12	60	
Queue Length 95th (ft)	195	27	169		33	124	
Internal Link Dist (ft)	1565		865			920	
Turn Bay Length (ft)		250			25		
Base Capacity (vph)	700	673	714		359	1036	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.50	0.32	0.49		0.21	0.31	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 54.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 15.9 — Intersection LOS: B
Intersection Capacity Utilization 57.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Merritt Mill Road & Cameron Avenue



No-Build (2030) PM.syn VHB

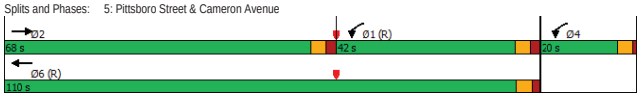
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø4
Lane Configurations								
Traffic Volume (vph)	152	157	474	384	0	0		
Future Volume (vph)	152	157	474	384	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	12	11	12	12	12		
Storage Length (ft)		0	0		0	0		
Storage Lanes		0	2		0	0		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00		
Ped Bike Factor	0.98		0.99					
Frt	0.932							
Flt Protected			0.950					
Satd. Flow (prot)	1536	0	2987	1676	0	0		
Flt Permitted			0.950					
Satd. Flow (perm)	1536	0	2943	1676	0	0		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)	55							
Link Speed (mph)	25			25	25			
Link Distance (ft)	1117			376	564			
Travel Time (s)	30.5			10.3	15.4			
Confl. Peds. (#/hr)		4	4		74	1		
Confl. Bikes (#/hr)		18						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Adj. Flow (vph)	169	174	527	427	0	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	343	0	527	427	0	0		
Turn Type	NA		Prot	NA				
Protected Phases	2		1 4	6			1	4
Permitted Phases								
Detector Phase	2		1 4	6				
Switch Phase								
Minimum Initial (s)	10.0			10.0			7.0	7.0
Minimum Split (s)	16.2			15.0			12.1	20.0
Total Split (s)	68.0			110.0			42.0	20.0
Total Split (%)	52.3%			84.6%			32%	15%
Maximum Green (s)	62.8			105.0			36.9	16.0
Yellow Time (s)	3.1			3.3			3.0	3.0
All-Red Time (s)	2.1			1.7			2.1	1.0
Lost Time Adjust (s)	-0.2			0.0				
Total Lost Time (s)	5.0			5.0				
Lead/Lag	Lead						Lag	
Lead-Lag Optimize?								
Vehicle Extension (s)	1.0			1.0			4.0	0.2
Recall Mode	Min			C-Min			C-Max	None
Walk Time (s)	7.0							7.0
Flash Dont Walk (s)	4.0							9.0
Pedestrian Calls (#/hr)	0							0
Act Effct Green (s)	30.8		89.2	114.0				
Actuated g/C Ratio	0.24		0.69	0.88				

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø4
v/c Ratio	0.85		0.26	0.29				
Control Delay	57.6		8.4	1.9				
Queue Delay	0.0		0.3	1.5				
Total Delay	57.6		8.7	3.4				
LOS	E		A	A				
Approach Delay	57.6			6.3				
Approach LOS	E			A				
Queue Length 50th (ft)	237		63	33				
Queue Length 95th (ft)	314		m117	m50				
Internal Link Dist (ft)	1037			296	484			
Turn Bay Length (ft)								
Base Capacity (vph)	772		2257	1469				
Starvation Cap Reductn	0		1040	828				
Spillback Cap Reductn	0		0	0				
Storage Cap Reductn	0		0	0				
Reduced v/c Ratio	0.44		0.43	0.67				

Intersection Summary

Area Type: CBD
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 102 (78%), Referenced to phase 1:WBL and 6:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 19.9 — Intersection LOS: B
Intersection Capacity Utilization 50.1% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Pittsboro Street & Cameron Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	126	0	0	196	43	213	495	68	110	0	437
Future Volume (vph)	20	126	0	0	196	43	213	495	68	110	0	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	10	10	10	11	11	12
Storage Length (ft)	110		0	0		0	0		0	300		0
Storage Lanes	1		0	0		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.95	1.00	1.00	0.88
Ped Bike Factor	0.89				0.96		0.60	0.92		0.77		0.43
Frt					0.976			0.982				0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1540	1676	0	0	1563	0	1353	2597	0	1540	0	2508
Flt Permitted	0.267						0.950	0.998		0.950		
Satd. Flow (perm)	386	1676	0	0	1563	0	813	2559	0	1178	0	1077
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)					8			10				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		376			2112			887			972	
Travel Time (s)		10.3			57.6			24.2			26.5	
Confl. Peds. (#/hr)	132		360	360		132	245		165	165		245
Confl. Bikes (#/hr)			9			35			12			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	22	140	0	0	218	48	237	550	76	122	0	486
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	22	140	0	0	266	0	213	650	0	122	0	486
Turn Type	Perm	NA			NA		Split	NA		Prot		Prot
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Detector Phase	4	4			8		2	2		1		1
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		7.0	7.0		7.0		7.0
Minimum Split (s)	27.1	27.1			30.2		23.2	23.2		25.6		25.6
Total Split (s)	30.2	30.2			30.2		39.8	39.8		32.0		32.0
Total Split (%)	23.2%	23.2%			23.2%		30.6%	30.6%		24.6%		24.6%
Maximum Green (s)	24.1	24.1			24.0		33.6	33.6		26.4		26.4
Yellow Time (s)	3.1	3.1			3.2		3.1	3.1		3.0		3.0
All-Red Time (s)	3.0	3.0			3.0		3.1	3.1		2.6		2.6
Lost Time Adjust (s)	-1.2	-1.2			-1.2		-1.2	-1.2		-0.6		-0.6
Total Lost Time (s)	4.9	4.9			5.0		5.0	5.0		5.0		5.0
Lead/Lag							Lag	Lag		Lead		Lead
Lead-Lag Optimize?							Yes	Yes		Yes		Yes
Vehicle Extension (s)	2.0	2.0			2.0		4.0	4.0		4.0		4.0
Recall Mode	Min	Min			Min		C-Max	C-Max		None		None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0		7.0
Flash Dont Walk (s)	10.0	10.0			17.0		5.0	5.0		13.0		13.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0		0
Act Effct Green (s)	24.2	24.2			24.1		35.9	35.9		27.0		27.0
Actuated g/C Ratio	0.19	0.19			0.19		0.28	0.28		0.21		0.21

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	22%
Maximum Green (s)	24.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	0.2
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	

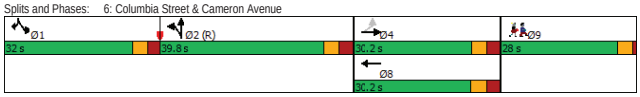
UNC DP TIA 2023 — No-Build (2030) PM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.31	0.45			0.90		0.57	0.90		0.38		0.93
Control Delay	21.9	16.7			82.1		41.2	54.2		48.5		77.0
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		0.0
Total Delay	21.9	16.7			82.1		41.2	54.2		48.5		77.0
LOS	C	B			F		D	D		D		E
Approach Delay		17.4			82.1			51.0			71.3	
Approach LOS		B			F			D			E	
Queue Length 50th (ft)	9	62			213		146	256		89		230
Queue Length 95th (ft)	m21	92			#366		m212	#400		151		#346
Internal Link Dist (ft)		296			2032			807			892	
Turn Bay Length (ft)	110									300		
Base Capacity (vph)	75	326			309		374	724		319		520
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		0
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.29	0.43			0.86		0.57	0.90		0.38		0.93

Intersection Summary

Area Type: CBD
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 7 (5%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 59.0 — Intersection LOS: E
Intersection Capacity Utilization 74.6% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Columbia Street & Cameron Avenue



UNC DP TIA 2023 — No-Build (2030) PM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	Ø9
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — No-Build (2030) PM
7: Raleigh Street & Cameron Avenue/Country Club Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	170	48	31	139	303	64	133	58	293	167	60
Future Volume (vph)	34	170	48	31	139	303	64	133	58	293	167	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	9	11	11	10	10	10	10	12	12
Storage Length (ft)	0		0	100		0	100		0	75		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			100			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96			0.90		0.75	0.91		0.86	0.90	
Frt		0.974			0.897			0.955			0.960	
Flt Protected		0.993		0.950			0.950			0.950		
Satd. Flow (prot)	0	1576	0	1433	1309	0	1486	1356	0	1486	1450	0
Flt Permitted		0.889		0.432			0.602			0.344		
Satd. Flow (perm)	0	1400	0	652	1309	0	703	1356	0	465	1450	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					153			22			21	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2112			312			770			994	
Travel Time (s)		57.6			8.5			21.0			27.1	
Confl. Peds. (#/hr)	42		40	40		42	112		86	86		112
Confl. Bikes (#/hr)			8			2			11			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	38	189	53	34	154	337	71	148	64	326	186	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	280	0	34	491	0	71	212	0	326	253	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.1	21.1		12.6	21.6		12.3	21.3		11.9	19.1	
Total Split (s)	31.0	31.0		12.6	43.6		12.3	23.0		23.4	34.1	
Total Split (%)	34.4%	34.4%		14.0%	48.4%		13.7%	25.6%		26.0%	37.9%	
Maximum Green (s)	24.9	24.9		7.0	38.0		7.0	17.7		18.5	29.0	
Yellow Time (s)	3.3	3.3		3.0	3.1		3.0	3.1		3.0	3.1	
All-Red Time (s)	2.8	2.8		2.6	2.5		2.3	2.2		1.9	2.0	
Lost Time Adjust (s)		-1.1		-0.6	-0.6		-0.3	-0.3		0.1	-0.1	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)	7.0	7.0			7.0			7.0			7.0	
Flash Dont Walk (s)	8.0	8.0			8.0			7.0			7.0	
Pedestrian Calls (#/hr)	0	0			0			0			0	
Act Effct Green (s)		32.9		40.5	40.5		23.1	15.8		39.5	29.7	
Actuated g/C Ratio		0.37		0.45	0.45		0.26	0.18		0.44	0.33	

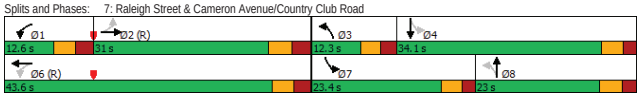
UNC DP TIA 2023 — No-Build (2030) PM
7: Raleigh Street & Cameron Avenue/Country Club Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.55		0.09	0.73		0.29	0.83		0.78	0.51	
Control Delay		31.0		15.2	19.3		19.1	56.9		32.8	26.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		31.0		15.2	19.3		19.1	56.9		32.8	26.8	
LOS		C		B	B		B	E		C	C	
Approach Delay		31.0			19.0			47.4			30.2	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)		149		9	87		19	102		114	100	
Queue Length 95th (ft)		#237		m24	#177		43	#210		#226	182	
Internal Link Dist (ft)		2032			232			690			914	
Turn Bay Length (ft)				100			100			75		
Base Capacity (vph)		522		359	681		244	288		421	500	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.54		0.09	0.72		0.29	0.74		0.77	0.51	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 15 (17%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 29.7 — Intersection LOS: C
Intersection Capacity Utilization 90.6% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Raleigh Street & Cameron Avenue/Country Club Road



UNC DP TIA 2023 — No-Build (2030) PM
8: Pittsboro Street & McCauley Street/South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	81	21	240	227	0	0	0	0	192	459	31
Future Volume (vph)	0	81	21	240	227	0	0	0	0	192	459	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			50			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor		0.96		0.86							0.95	
Frt		0.973									0.993	
Flt Protected				0.950							0.986	
Satd. Flow (prot)	0	1415	0	1593	1676	0	0	0	0	0	3085	0
Flt Permitted				0.684							0.986	
Satd. Flow (perm)	0	1415	0	982	1676	0	0	0	0	0	2959	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23									9	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1050			519			1147			237	
Travel Time (s)		28.6			14.2			31.3			6.5	
Confl. Peds. (#/hr)	86		112	112		86	101		67	67		101
Confl. Bikes (#/hr)			2			26			6			7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)		0	0									
Adj. Flow (vph)	0	90	23	267	252	0	0	0	0	213	510	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	113	0	267	252	0	0	0	0	0	757	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		22.8		23.6	23.6					23.3	23.3	
Total Split (s)		34.0		34.0	34.0					31.0	31.0	
Total Split (%)		52.3%		52.3%	52.3%					47.7%	47.7%	
Maximum Green (s)		29.2		28.4	28.4					25.7	25.7	
Yellow Time (s)		3.3		3.0	3.0					3.3	3.3	
All-Red Time (s)		1.5		2.6	2.6					2.0	2.0	
Lost Time Adjust (s)		-0.3		-0.3	-0.3						-0.1	
Total Lost Time (s)		4.5		5.3	5.3						5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		Ped		Ped	Ped					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		6.0		7.0	7.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		23.5		22.7	22.7						31.8	
Actuated g/C Ratio		0.36		0.35	0.35						0.49	

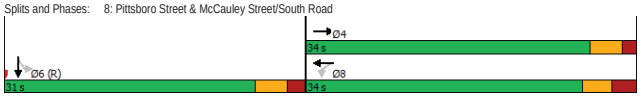
UNC DP TIA 2023 — No-Build (2030) PM
8: Pittsboro Street & McCauley Street/South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.21		0.78	0.43						0.52	
Control Delay		10.9		21.5	9.2						7.6	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		10.9		21.5	9.2						7.6	
LOS		B		C	A						A	
Approach Delay		10.9			15.5						7.6	
Approach LOS		B			B						A	
Queue Length 50th (ft)		23		31	29						79	
Queue Length 95th (ft)		47		m39	m37						100	
Internal Link Dist (ft)		970			439			1067			157	
Turn Bay Length (ft)				100								
Base Capacity (vph)		654		433	740						1452	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.17		0.62	0.34						0.52	

Intersection Summary

Area Type: CBD
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 16 (25%), Referenced to phase 6:SBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 10.8 — Intersection LOS: B
Intersection Capacity Utilization 64.0% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Pittsboro Street & McCauley Street/South Road



UNC DP TIA 2023 — No-Build (2030) PM
9: Columbia Street & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	323	0	0	434	238	129	531	135	0	0	0
Future Volume (vph)	52	323	0	0	434	238	129	531	135	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	13	13	12	11	11	11	11	11
Storage Length (ft)	75		0	0		125	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.94				0.99	0.85		0.89				
Frt					0.992	0.850		0.975				
Flt Protected	0.950				0.992			0.992				
Satd. Flow (prot)	1593	1788	0	0	1620	1399	0	3956	0	0	0	0
Flt Permitted	0.950				0.992			0.992				
Satd. Flow (perm)	1492	1788	0	0	1620	1193	0	3819	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					5	84		72				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		519			696			500			887	
Travel Time (s)		14.2			19.0			13.6			24.2	
Confl. Peds. (#/hr)	105		109	109		105	105		203	203		105
Confl. Bikes (#/hr)			5			24			32			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	58	359	0	0	482	264	143	590	150	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	58	359	0	0	508	238	0	883	0	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA				
Protected Phases	7	4			8			2				
Permitted Phases						8	2					
Detector Phase	7	4			8	8	2	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Minimum Split (s)	8.0	20.0			20.0	20.0	20.0	20.0				
Total Split (s)	8.0	40.0			32.0	32.0	25.0	25.0				
Total Split (%)	12.3%	61.5%			49.2%	49.2%	38.5%	38.5%				
Maximum Green (s)	4.0	36.0			28.0	28.0	21.0	21.0				
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5	3.5				
All-Red Time (s)	0.5	0.5			0.5	0.5	0.5	0.5				
Lost Time Adjust (s)	-0.6	-0.6			-0.5	-0.5		-0.9				
Total Lost Time (s)	3.4	3.4			3.5	3.5		3.1				
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Recall Mode	None	None			None	None	C-Max	C-Max				
Walk Time (s)		5.0			5.0	5.0	5.0	5.0				
Flash Dont Walk (s)		11.0			11.0	11.0	11.0	11.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	4.6	29.8			24.9	24.9		28.7				
Actuated g/C Ratio	0.07	0.46			0.38	0.38		0.44				

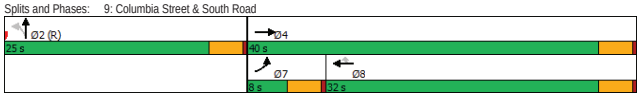
UNC DP TIA 2023 — No-Build (2030) PM
9: Columbia Street & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.52	0.44			0.81	0.47		0.51				
Control Delay	51.8	10.4			22.4	7.9		15.1				
Queue Delay	0.0	0.0			0.0	0.0		0.0				
Total Delay	51.8	10.4			22.4	7.9		15.1				
LOS	D	B			C	A		B				
Approach Delay		16.2			17.8			15.1				
Approach LOS		B			B			B				
Queue Length 50th (ft)	23	51			110	17		92				
Queue Length 95th (ft)	m50	66			151	m47		138				
Internal Link Dist (ft)		439			616			420			807	
Turn Bay Length (ft)	75					125						
Base Capacity (vph)	112	1006			713	570		1725				
Starvation Cap Reductn	0	0			0	0		0				
Spillback Cap Reductn	0	0			0	0		0				
Storage Cap Reductn	0	0			0	0		0				
Reduced v/c Ratio	0.52	0.36			0.71	0.42		0.51				

Intersection Summary

Area Type: CBD
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 16.3 — Intersection LOS: B
Intersection Capacity Utilization 64.0% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Columbia Street & South Road



UNC DP TIA 2023 — No-Build (2030) PM
10: South Road & Raleigh Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	91	314	300	89	75	149
Future Volume (vph)	91	314	300	89	75	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	11	11
Storage Length (ft)	225			190	75	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93			0.85	0.69	0.49
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	1676	1621	1378	1540	1378
Flt Permitted	0.539				0.950	
Satd. Flow (perm)	844	1676	1621	1177	1058	679
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				99		166
Link Speed (mph)		25	25		25	
Link Distance (ft)		516	1148		454	
Travel Time (s)		14.1	31.3		12.4	
Confl. Peds. (#/hr)	63			63	132	209
Confl. Bikes (#/hr)				6		4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	101	349	333	99	83	166
Shared Lane Traffic (%)						
Lane Group Flow (vph)	101	349	333	99	83	166
Turn Type	D.P+P	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	6			6		4
Detector Phase	5	2	6	6	4	5
Switch Phase						
Minimum Initial (s)	7.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	12.6	15.8	28.8	28.8	24.8	12.6
Total Split (s)	20.0	63.0	43.0	43.0	27.0	20.0
Total Split (%)	22.2%	70.0%	47.8%	47.8%	30.0%	22.2%
Maximum Green (s)	14.4	57.2	37.2	37.2	21.2	14.4
Yellow Time (s)	3.0	3.2	3.2	3.2	3.0	3.0
All-Red Time (s)	2.6	2.6	2.6	2.6	2.8	2.6
Lost Time Adjust (s)	-0.6	-0.7	-0.8	-0.8	-0.6	-0.6
Total Lost Time (s)	5.0	5.1	5.0	5.0	5.2	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Vehicle Extension (s)	1.0	3.0	1.0	1.0	2.0	1.0
Recall Mode	None	C-Min	Min	Min	None	None
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			16.0	16.0	12.0	
Pedestrian Calls (#/hr)			0	0	0	
Act Effct Green (s)	67.1	73.0	59.5	59.5	10.2	16.5
Actuated g/C Ratio	0.75	0.81	0.66	0.66	0.11	0.18

UNC DP TIA 2023 — No-Build (2030) PM
10: South Road & Raleigh Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.15	0.26	0.31	0.12	0.47	0.52
Control Delay	3.5	3.6	8.7	2.1	33.7	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.5	3.6	8.7	2.1	33.7	8.5
LOS	A	A	A	A	C	A
Approach Delay		3.5	7.1		16.9	
Approach LOS		A	A		B	
Queue Length 50th (ft)	10	43	78	0	27	2
Queue Length 95th (ft)	27	88	143	19	m57	26
Internal Link Dist (ft)		436	1068		374	
Turn Bay Length (ft)	225			190	75	
Base Capacity (vph)	801	1360	1072	811	373	418
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.26	0.31	0.12	0.22	0.40

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 52 (58%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 7.9 — Intersection LOS: A
Intersection Capacity Utilization 53.3% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: South Road & Raleigh Street



UNC DP TIA 2023 — No-Build (2030) PM
11: Country Club Road & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	376	40	225	346	475	22	124	287	486	107	13
Future Volume (vph)	29	376	40	225	346	475	22	124	287	486	107	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	14	12	12	14	12	15	12	11	16	12
Storage Length (ft)	0		0	200		0	0		0	75		0
Storage Lanes	1		0	1		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor	0.96	0.99		0.98		0.94		1.00	0.98	1.00	1.00	
Frt		0.986				0.850			0.850		0.994	
Flt Protected	0.950			0.950				0.993		0.950	0.971	
Satd. Flow (prot)	1711	3462	0	1770	1863	1689	0	2035	1583	1625	1932	0
Flt Permitted	0.534			0.277				0.993		0.950	0.971	
Satd. Flow (perm)	926	3462	0	505	1863	1580	0	2027	1559	1624	1931	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				146			127		2	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		362			1042			215			421	
Travel Time (s)		9.9			28.4			4.2			11.5	
Confl. Peds. (#/hr)	30		27	27		30	45		1	1		45
Confl. Bikes (#/hr)			9			1			1			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	32	418	44	250	384	528	24	138	319	540	119	14
Shared Lane Traffic (%)										38%		
Lane Group Flow (vph)	32	462	0	250	384	528	0	162	319	335	338	0
Turn Type	Perm	NA		pm+pt	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases		2		1	6	4	3	3	1	4	4	
Permitted Phases	2			6		6		3	3			
Detector Phase	2	2		1	6	4	3	3	1	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	33.1	33.1		12.1	31.1	42.0	13.6	13.6	12.1	42.0	42.0	
Total Split (s)	34.0	34.0		14.0	48.0	42.0	15.0	15.0	14.0	42.0	42.0	
Total Split (%)	32.4%	32.4%		13.3%	45.7%	40.0%	14.3%	14.3%	13.3%	40.0%	40.0%	
Maximum Green (s)	27.9	27.9		8.9	41.9	35.0	8.4	8.4	8.9	35.0	35.0	
Yellow Time (s)	3.7	3.7		3.0	3.7	3.1	3.3	3.3	3.0	3.1	3.1	
All-Red Time (s)	2.4	2.4		2.1	2.4	3.9	3.3	3.3	2.1	3.9	3.9	
Lost Time Adjust (s)	-0.7	-0.7		-0.1	-0.6	-1.7		-1.3	-0.1	-1.7	-1.7	
Total Lost Time (s)	5.4	5.4		5.0	5.5	5.3		5.3	5.0	5.3	5.3	
Lead/Lag	Lag	Lag		Lead		Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?						Yes				Yes	Yes	
Vehicle Extension (s)	3.0	3.0		1.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	
Recall Mode	Min	Min		None	Min	None	None	None	None	None	None	
Walk Time (s)	7.0	7.0			7.0	7.0				7.0	7.0	
Flash Dont Walk (s)	20.0	20.0			18.0	28.0				28.0	28.0	
Pedestrian Calls (#/hr)	0	0			0	0				0	0	
Act Effct Green (s)	17.0	17.0		31.3	30.8	53.4		9.6	18.7	22.3	22.3	
Actuated g/C Ratio	0.21	0.21		0.39	0.39	0.67		0.12	0.24	0.28	0.28	

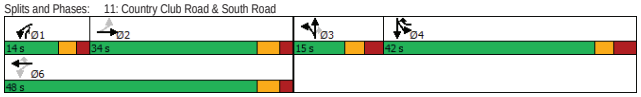
UNC DP TIA 2023 — No-Build (2030) PM
11: Country Club Road & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.16	0.62		0.74	0.53	0.46		0.66	0.68	0.73	0.62	
Control Delay	29.9	32.4		34.2	23.1	4.0		51.1	19.3	36.2	30.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.1	
Total Delay	29.9	32.4		34.2	23.1	4.0		51.1	19.3	36.3	30.2	
LOS	C	C		C	C	A		D	B	D	C	
Approach Delay		32.3			16.8			30.0			33.3	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	13	106		84	141	49		77	40	154	149	
Queue Length 95th (ft)	41	182		#217	275	79		#211	#155	275	261	
Internal Link Dist (ft)		282			962			135			341	
Turn Bay Length (ft)				200						75		
Base Capacity (vph)	342	1288		347	1024	1250		255	476	772	919	
Starvation Cap Reductn	0	0		0	0	0		0	0	24	53	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.09	0.36		0.72	0.38	0.42		0.64	0.67	0.45	0.39	

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 79.3
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 25.7 — Intersection LOS: C
Intersection Capacity Utilization 82.3% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Country Club Road & South Road



UNC DP TIA 2023 — No-Build (2030) PM
12: Columbia Street & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	185	0	213	0	366	0	319	40	0	0	0
Future Volume (vph)	67	185	0	213	0	366	0	319	40	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			4%			-4%			0%	
Storage Length (ft)	100		0	0		0	100		150	0		0
Storage Lanes	1		0	1		2	1		1	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.96			0.95		0.80			0.98			
Frt						0.850			0.850			
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1778	3557	0	1734	0	2731	0	3610	1615	0	0	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1700	3557	0	1650	0	2173	0	3610	1578	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	139					407			44			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		218			284			267			526	
Travel Time (s)		5.9			7.7			7.3			14.3	
Confl. Peds. (#/hr)	43		37	37		43	21		11	11		21
Confl. Bikes (#/hr)			15			11			3			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	74	206	0	237	0	407	0	354	44	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	74	206	0	237	0	407	0	354	44	0	0	0
Turn Type	Prot	NA		Prot		Perm		NA	pm+ov			
Protected Phases	7	4		3				2	3			
Permitted Phases						3		2	2			
Detector Phase	7	4		3		3		2	3			
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0		7.0		10.0	7.0			
Minimum Split (s)	11.9	25.6		12.9		12.9		30.0	12.9			
Total Split (s)	25.6	25.6		14.3		14.3		30.1	14.3			
Total Split (%)	36.6%	36.6%		20.4%		20.4%		43.0%	20.4%			
Maximum Green (s)	20.7	20.0		8.4		8.4		24.1	8.4			
Yellow Time (s)	3.0	3.2		3.0		3.0		3.4	3.0			
All-Red Time (s)	1.9	2.4		2.9		2.9		2.6	2.9			
Lost Time Adjust (s)	0.1	-0.6		-0.9		-0.9		-1.0	-0.9			
Total Lost Time (s)	5.0	5.0		5.0		5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0		1.0		3.0	1.0			
Recall Mode	None	None		None		None		Min	None			
Walk Time (s)		4.0						4.0				
Flash Dont Walk (s)		16.0						20.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	7.5	7.8		9.3		9.3		11.4	20.7			
Actuated g/C Ratio	0.17	0.18		0.21		0.21		0.26	0.48			

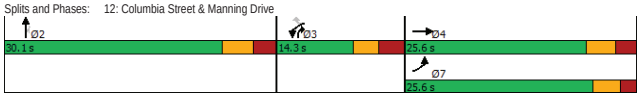
UNC DP TIA 2023 — No-Build (2030) PM
12: Columbia Street & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.18	0.32		0.64		0.52		0.37	0.06			
Control Delay	2.2	17.3		26.6		5.0		14.5	1.9			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	2.2	17.3		26.6		5.0		14.5	1.9			
LOS	A	B		C		A		B	A			
Approach Delay		13.3			13.0			13.1				
Approach LOS		B			B			B				
Queue Length 50th (ft)	0	23		53		0		37	0			
Queue Length 95th (ft)	9	47		#138		30		65	8			
Internal Link Dist (ft)		138			204			187			446	
Turn Bay Length (ft)	100								150			
Base Capacity (vph)	915	1685		370		784		2084	782			
Starvation Cap Reductn	0	0		0		0		0	0			
Spillback Cap Reductn	0	0		0		0		0	0			
Storage Cap Reductn	0	0		0		0		0	0			
Reduced v/c Ratio	0.08	0.12		0.64		0.52		0.17	0.06			

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 43.5
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 13.1 — Intersection LOS: B
Intersection Capacity Utilization 50.1% — ICU Level of Service A
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Columbia Street & Manning Drive



UNC DP TIA 2023 — No-Build (2030) PM
13: West Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	192	19	13	494	8	53	1	14	6	5	27
Future Volume (vph)	12	192	19	13	494	8	53	1	14	6	5	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			3%			0%			-3%	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			1.00			0.98			0.97	0.99
Frt		0.987			0.998			0.972				0.850
Flt Protected		0.997			0.999			0.963			0.974	
Satd. Flow (prot)	0	3488	0	0	3475	0	0	1715	0	0	1842	1607
Flt Permitted		0.926			0.947			0.766			0.851	
Satd. Flow (perm)	0	3239	0	0	3282	0	0	1364	0	0	1558	1587
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			3			16				114
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		388			334			349			293	
Travel Time (s)		7.6			6.5			9.5			8.0	
Confl. Peds. (#/hr)			107	107					66	66		
Confl. Bikes (#/hr)			7			2			1			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	213	21	14	549	9	59	1	16	7	6	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	247	0	0	572	0	0	76	0	0	13	30
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	20.4	20.4		11.9	23.9		26.7	26.7		28.5	28.5	28.5
Total Split (s)	28.6	28.6		12.2	40.8		29.2	29.2		29.2	29.2	29.2
Total Split (%)	40.9%	40.9%		17.4%	58.3%		41.7%	41.7%		41.7%	41.7%	41.7%
Maximum Green (s)	23.2	23.2		7.3	35.9		23.5	23.5		23.7	23.7	23.7
Yellow Time (s)	3.5	3.5		3.0	3.1		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	1.9	1.9		1.9	1.8		2.4	2.4		2.2	2.2	2.2
Lost Time Adjust (s)		-0.4			0.1			-0.7			-0.5	-0.5
Total Lost Time (s)		5.0			5.0			5.0			5.0	5.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		1.0	2.0		1.0	1.0		1.0	1.0	1.0
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	8.0	8.0			12.0		14.0	14.0		16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)		55.0			55.0			8.6			8.5	8.5
Actuated g/C Ratio		0.79			0.79			0.12			0.12	0.12
v/c Ratio		0.10			0.22			0.42			0.07	0.10
Control Delay		2.6			0.7			30.6			27.2	0.7
Queue Delay		0.0			0.0			0.0			0.0	0.0

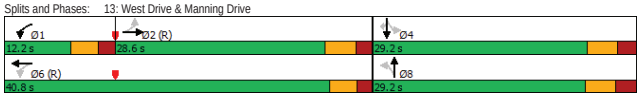
UNC DP TIA 2023 — No-Build (2030) PM
13: West Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		2.6			0.7			30.6			27.2	0.7
LOS		A			A			C			C	A
Approach Delay		2.6			0.7			30.6			8.7	
Approach LOS		A			A			C			A	
Queue Length 50th (ft)		10			2			25			5	0
Queue Length 95th (ft)		23			14			60			19	0
Internal Link Dist (ft)		308			254			269			213	
Turn Bay Length (ft)												
Base Capacity (vph)		2546			2577			482			538	623
Starvation Cap Reductn		0			0			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.10			0.22			0.16			0.02	0.05

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 25 (36%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.42
Intersection Signal Delay: 4.0 — Intersection LOS: A
Intersection Capacity Utilization 48.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 13: West Drive & Manning Drive



UNC DP TIA 2023 — No-Build (2030) PM
14: East Drive/Hospital Entrance & Manning Drive — Lanes, Volumes, Timings

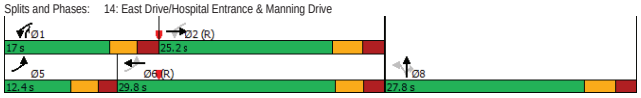
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	212	51	84	424	46	105	34	380	0	0	0
Future Volume (vph)	31	212	51	84	424	46	105	34	380	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		-4%			3%			-4%			0%	
Storage Length (ft)	150		0	100		0	100		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.94	0.96		0.87	0.99				0.95			
Frt		0.971			0.985				0.850			
Flt Protected	0.950			0.950				0.964				
Satd. Flow (prot)	1685	3132	0	1627	3159	0	0	1709	1507	0	0	0
Flt Permitted	0.458			0.573				0.964				
Satd. Flow (perm)	763	3132	0	850	3159	0	0	1709	1433	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			18				129			
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		382			469			315			391	
Travel Time (s)		7.4			9.1			8.6			10.7	
Confl. Peds. (#/hr)	124		109	109		124			40	40		
Confl. Bikes (#/hr)			3									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	34	236	57	93	471	51	117	38	422	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	293	0	93	522	0	0	155	422	0	0	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov			
Protected Phases	5	2		1	6			8	1			
Permitted Phases	6			2			8		8			
Detector Phase	5	2		1	6		8	8	1			
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		7.0	7.0	5.0			
Minimum Split (s)	12.4	25.0		12.4	24.6		27.8	27.8	12.4			
Total Split (s)	12.4	25.2		17.0	29.8		27.8	27.8	17.0			
Total Split (%)	17.7%	36.0%		24.3%	42.6%		39.7%	39.7%	24.3%			
Maximum Green (s)	7.3	19.2		11.6	24.2		22.0	22.0	11.6			
Yellow Time (s)	3.0	3.4		3.0	3.1		3.4	3.4	3.0			
All-Red Time (s)	2.1	2.6		2.4	2.5		2.4	2.4	2.4			
Lost Time Adjust (s)	-0.4	-0.9		-0.4	-0.6			-1.2	-0.4			
Total Lost Time (s)	4.7	5.1		5.0	5.0			4.6	5.0			
Lead/Lag	Lead	Lag		Lead	Lag				Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	1.0	1.0			
Recall Mode	None	C-Min		None	C-Min		None	None	None			
Walk Time (s)		7.0			7.0		7.0	7.0				
Flash Dont Walk (s)		12.0			12.0		15.0	15.0				
Pedestrian Calls (#/hr)		0			0		0	0				
Act Effct Green (s)	47.4	35.6		44.0	44.9			11.4	19.3			

UNC DP TIA 2023 — No-Build (2030) PM
14: East Drive/Hospital Entrance & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.68	0.51		0.63	0.64			0.16	0.28			
v/c Ratio	0.06	0.18		0.15	0.26			0.56	0.85			
Control Delay	3.1	6.6		3.2	2.8			34.2	30.2			
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0			
Total Delay	3.1	6.6		3.2	2.8			34.2	30.2			
LOS	A	A		A	A			C	C			
Approach Delay		6.3			2.9			31.2				
Approach LOS		A			A			C				
Queue Length 50th (ft)	2	14		6	16			63	108			
Queue Length 95th (ft)	9	53		12	23			108	157			
Internal Link Dist (ft)		302			389			235			311	
Turn Bay Length (ft)	150			100								
Base Capacity (vph)	628	1615		710	2034			566	573			
Starvation Cap Reductn	0	0		0	0			0	0			
Spillback Cap Reductn	0	0		0	0			0	0			
Storage Cap Reductn	0	0		0	0			0	0			
Reduced v/c Ratio	0.05	0.18		0.13	0.26			0.27	0.74			

Intersection Summary
Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 10 (14%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 14.4 — Intersection LOS: B
Intersection Capacity Utilization 51.2% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 14: East Drive/Hospital Entrance & Manning Drive



UNC DP TIA 2023 — No-Build (2030) PM
15: Skipper Bowles Drive/Ridge Road & Manning Drive — Lanes, Volumes, Timings

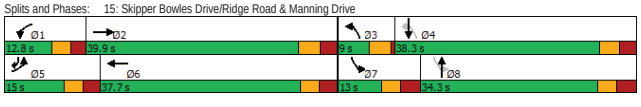
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	713	54	12	152	57	119	138	38	106	80	186
Future Volume (vph)	177	713	54	12	152	57	119	138	38	106	80	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	10	11	12	10	12	12	12	12	12
Grade (%)		-2%			6%			12%			2%	
Storage Length (ft)	100		0	100		0	0		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			0.99		1.00					0.98
Frt		0.989			0.959			0.968				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	3414	0	1602	3163	0	1553	1695	0	1752	1844	1567
Flt Permitted	0.950			0.950			0.699			0.539		
Satd. Flow (perm)	1664	3414	0	1602	3163	0	1140	1695	0	994	1844	1544
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			57			14				207
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		348			791			579			293	
Travel Time (s)		9.5			21.6			15.8			8.0	
Confl. Peds. (#/hr)	2					2	2					2
Confl. Bikes (#/hr)			2									2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	197	792	60	13	169	63	132	153	42	118	89	207
Shared Lane Traffic (%)												
Lane Group Flow (vph)	197	852	0	13	232	0	132	195	0	118	89	207
Turn Type	Prot	NA		Prot	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases							4			8		4
Detector Phase	5	2		1	6		3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		4.0	7.0		7.0	7.0	7.0
Minimum Split (s)	12.9	35.2		12.8	37.0		8.0	34.3		13.0	33.0	12.9
Total Split (s)	15.0	39.9		12.8	37.7		9.0	34.3		13.0	38.3	15.0
Total Split (%)	15.0%	39.9%		12.8%	37.7%		9.0%	34.3%		13.0%	38.3%	15.0%
Maximum Green (s)	9.4	33.7		7.4	31.7		5.0	28.0		7.0	32.3	9.4
Yellow Time (s)	3.0	3.3		3.0	3.0		3.5	3.0		3.0	3.1	3.0
All-Red Time (s)	2.6	2.9		2.4	3.0		0.5	3.3		3.0	2.9	2.6
Lost Time Adjust (s)	-0.9	-1.3		-0.8	-1.1		-1.2	-1.2		-0.9	-0.9	-0.9
Total Lost Time (s)	4.7	4.9		4.6	4.9		2.8	5.1		5.1	5.1	4.7
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	2.0	3.0		2.0	2.0		3.0	2.0		2.0	2.0	2.0
Recall Mode	None	Min		None	Min		None	None		None	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			24.0			21.0			20.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	10.8	30.4		8.2	16.5		23.5	13.3		19.3	16.3	27.5

UNC DP TIA 2023 — No-Build (2030) PM
15: Skipper Bowles Drive/Ridge Road & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.16	0.46		0.12	0.25		0.36	0.20		0.29	0.25	0.42
v/c Ratio	0.72	0.54		0.07	0.28		0.30	0.55		0.31	0.20	0.27
Control Delay	48.1	16.7		33.3	16.8		16.2	30.4		17.4	22.3	3.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	48.1	16.7		33.3	16.8		16.2	30.4		17.4	22.3	3.2
LOS	D	B		C	B		B	C		B	C	A
Approach Delay		22.6			17.7			24.7			11.3	
Approach LOS		C			B			C			B	
Queue Length 50th (ft)	74	121		5	30		30	64		28	27	0
Queue Length 95th (ft)	#260	272		25	62		93	159		84	77	38
Internal Link Dist (ft)		268			711			499			213	
Turn Bay Length (ft)	100			100								100
Base Capacity (vph)	273	1904		208	1677		446	794		386	973	768
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.72	0.45		0.06	0.14		0.30	0.25		0.31	0.09	0.27

Intersection Summary
Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 65.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 20.0 — Intersection LOS: C
Intersection Capacity Utilization 59.1% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Skipper Bowles Drive/Ridge Road & Manning Drive



UNC DP TIA 2023 — No-Build (2030) PM
16: Columbia Street & Westwood Drive/Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	6	431	7	84	20	352	101	84	716	9
Future Volume (vph)	1	0	6	431	7	84	20	352	101	84	716	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-1%			-3%			-3%			4%	
Storage Length (ft)	0		0	0		250	150		200	0		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.84			0.85	0.86			0.96	0.99	1.00	
Frt		0.882				0.850			0.850		0.998	
Flt Protected		0.994			0.953		0.950			0.950		
Satd. Flow (prot)	0	1392	0	0	1742	1554	1796	1891	1714	1676	1760	0
Flt Permitted		0.994			0.953		0.127			0.381		
Satd. Flow (perm)	0	1383	0	0	1479	1341	240	1891	1644	667	1760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		107				78			112		1	
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		283			749			309			956	
Travel Time (s)		6.4			20.4			8.4			26.1	
Confl. Peds. (#/hr)	38		47	47		38	66		8	8		6
Confl. Bikes (#/hr)			1			16						14
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1	0	7	479	8	93	22	391	112	93	796	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	487	93	22	391	112	93	806	0
Turn Type	Split	NA		Split	NA	pm+ov	D.Pm	NA	pm+ov	D.P+P	NA	
Protected Phases	4	4		3	3	1		2	3	1	6	
Permitted Phases						3	6		2	2		
Detector Phase	4	4		3	3	1	6	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	10.0	10.0	7.0	7.0	10.0	
Minimum Split (s)	28.3	28.3		33.4	33.4	11.9	16.9	30.9	33.4	11.9	16.9	
Total Split (s)	28.3	28.3		45.4	45.4	12.8	71.3	58.5	45.4	12.8	71.3	
Total Split (%)	19.5%	19.5%		31.3%	31.3%	8.8%	49.2%	40.3%	31.3%	8.8%	49.2%	
Maximum Green (s)	22.0	22.0		39.0	39.0	7.9	65.4	52.6	39.0	7.9	65.4	
Yellow Time (s)	3.3	3.3		3.5	3.5	3.1	3.6	3.6	3.5	3.1	3.6	
All-Red Time (s)	3.0	3.0		2.9	2.9	1.8	2.3	2.3	2.9	1.8	2.3	
Lost Time Adjust (s)		-1.3			-1.4	0.1	-0.9	-0.9	-1.4	0.1	-0.9	
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead		Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min	None	None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Flash Dont Walk (s)	18.0	18.0		23.0	23.0		7.0	21.0	23.0		7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	
Act Effct Green (s)		8.3			40.5	47.9	64.8	52.4	92.9	59.7	64.8	

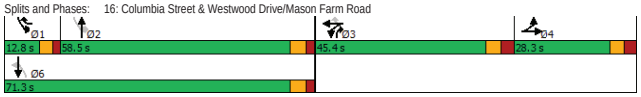
UNC DP TIA 2023 — No-Build (2030) PM
16: Columbia Street & Westwood Drive/Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.07			0.34	0.41	0.55	0.45	0.79	0.51	0.55	
v/c Ratio		0.04			0.81	0.15	0.17	0.46	0.08	0.23	0.83	
Control Delay		0.4			48.3	5.9	18.6	25.8	0.7	15.0	31.8	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		0.4			48.3	5.9	18.6	25.8	0.7	15.0	31.8	
LOS		A			D	A	B	C	A	B	C	
Approach Delay		0.4			41.5			20.1			30.0	
Approach LOS		A			D			C			C	
Queue Length 50th (ft)		0			330	6	7	194	0	30	458	
Queue Length 95th (ft)		0			#594	34	30	338	13	70	#873	
Internal Link Dist (ft)		203			669			229			876	
Turn Bay Length (ft)						250	150		200			
Base Capacity (vph)		362			599	610	135	863	1345	408	994	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.02			0.81	0.15	0.16	0.45	0.08	0.23	0.81	

Intersection Summary

Area Type: Other
Cycle Length: 145
Actuated Cycle Length: 117.7
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 30.6 — Intersection LOS: C
Intersection Capacity Utilization 90.0% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 16: Columbia Street & Westwood Drive/Mason Farm Road



UNC DP TIA 2023 — No-Build (2030) PM
17: West Drive & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	162	8	4	445	49	0	0	0	24	0	11
Future Volume (vph)	9	162	8	4	445	49	0	0	0	24	0	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			4%			0%			1%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.97						0.82	
Frt		0.994			0.987						0.958	
Flt Protected		0.997									0.967	
Satd. Flow (prot)	0	1837	0	0	1755	0	0	0	0	0	1670	0
Flt Permitted		0.975			0.999						0.967	
Satd. Flow (perm)	0	1788	0	0	1750	0	0	0	0	0	1413	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			12						34	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		344			481			500			293	
Travel Time (s)		9.4			13.1			11.4			8.0	
Confl. Peds. (#/hr)	88		123	123		88	31		99	99		31
Confl. Bikes (#/hr)			3			2						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	180	9	4	494	54	0	0	0	27	0	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	199	0	0	552	0	0	0	0	0	39	0
Turn Type	Perm	NA		Perm	NA					Perm	NA	
Protected Phases		2			6						4	
Permitted Phases	2			6						4		
Detector Phase	2	2		6	6					4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0					7.0	7.0	
Minimum Split (s)	23.0	23.0		23.8	23.8					25.6	25.6	
Total Split (s)	62.0	62.0		62.0	62.0					28.0	28.0	
Total Split (%)	68.9%	68.9%		68.9%	68.9%					31.1%	31.1%	
Maximum Green (s)	57.0	57.0		56.2	56.2					22.4	22.4	
Yellow Time (s)	3.5	3.5		3.0	3.0					3.2	3.2	
All-Red Time (s)	1.5	1.5		2.8	2.8					2.4	2.4	
Lost Time Adjust (s)		0.0			-0.9						-0.2	
Total Lost Time (s)		5.0			4.9						5.4	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0					2.0	2.0	
Recall Mode	C-Min	C-Min		Min	Min					None	None	
Walk Time (s)	7.0	7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)	6.0	6.0		9.0	9.0					13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0					0	0	
Act Effct Green (s)		79.2			79.3						7.4	
Actuated g/C Ratio		0.88			0.88						0.08	
v/c Ratio		0.13			0.36						0.27	
Control Delay		1.7			2.3						20.6	
Queue Delay		0.0			0.2						0.0	

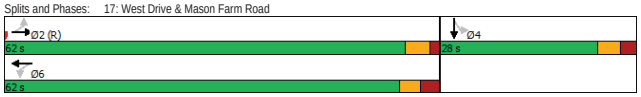
UNC DP TIA 2023 — No-Build (2030) PM
17: West Drive & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		1.7			2.5						20.6	
LOS		A			A						C	
Approach Delay		1.7			2.5						20.6	
Approach LOS		A			A						C	
Queue Length 50th (ft)		18			52						3	
Queue Length 95th (ft)		33			80						33	
Internal Link Dist (ft)		264			401			420			213	
Turn Bay Length (ft)												
Base Capacity (vph)		1574			1543						380	
Starvation Cap Reductn		0			371						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.13			0.47						0.10	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 29 (32%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.36
Intersection Signal Delay: 3.2 — Intersection LOS: A
Intersection Capacity Utilization 51.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 17: West Drive & Mason Farm Road



UNC DP TIA 2023 — No-Build (2030) PM
18: Mason Farm Road & East Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	217	91	95	214	11	69	3	27	0	0	0
Future Volume (vph)	18	217	91	95	214	11	69	3	27	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	50		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.92	0.92		0.87	0.99			0.93				
Frt		0.956			0.993			0.963				
Flt Protected	0.950			0.950				0.966				
Satd. Flow (prot)	1770	1637	0	1770	1837	0	0	1640	0	0	0	0
Flt Permitted	0.604			0.511				0.966				
Satd. Flow (perm)	1031	1637	0	832	1837	0	0	1569	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			3			19				
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		481			155			560			76	
Travel Time (s)		13.1			4.2			15.3			1.7	
Confl. Peds. (#/hr)	70		135	135		70	26		37	37		16
Confl. Bikes (#/hr)			7			2			1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	20	241	101	106	238	12	77	3	30	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	342	0	106	250	0	0	110	0	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA				
Protected Phases	5	2		1	6		8	8				
Permitted Phases	2			6								
Detector Phase	5	2		1	6		8	8				
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0				
Minimum Split (s)	29.1	29.3		29.8	19.3		24.3	24.3				
Total Split (s)	29.1	35.6		30.0	36.5		24.4	24.4				
Total Split (%)	32.3%	39.6%		33.3%	40.6%		27.1%	27.1%				
Maximum Green (s)	25.0	30.3		25.2	31.2		19.1	19.1				
Yellow Time (s)	3.0	3.2		3.0	3.2		3.0	3.0				
All-Red Time (s)	1.1	2.1		1.8	2.1		2.3	2.3				
Lost Time Adjust (s)	0.9	-0.2		0.4	-0.2			-0.4				
Total Lost Time (s)	5.0	5.1		5.2	5.1			4.9				
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	1.0				
Recall Mode	None	C-Min		None	C-Min		None	None				
Walk Time (s)	5.0	7.0		5.0	7.0		7.0	7.0				
Flash Dont Walk (s)	20.0	17.0		20.0	7.0		12.0	12.0				
Pedestrian Calls (#/hr)	0	0		0	0		0	0				
Act Effct Green (s)	68.4	64.4		70.9	69.4			9.6				
Actuated g/C Ratio	0.76	0.72		0.79	0.77			0.11				

UNC DP TIA 2023 — No-Build (2030) PM
18: Mason Farm Road & East Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.02	0.29		0.15	0.18			0.57				
Control Delay	2.8	6.8		3.1	5.2			43.0				
Queue Delay	0.0	0.0		0.0	0.0			0.0				
Total Delay	2.8	6.8		3.1	5.2			43.0				
LOS	A	A		A	A			D				
Approach Delay		6.5			4.6			43.0				
Approach LOS		A			A			D				
Queue Length 50th (ft)	1	69		10	26			50				
Queue Length 95th (ft)	7	141		27	92			98				
Internal Link Dist (ft)		401			75			480				1
Turn Bay Length (ft)	50			100								
Base Capacity (vph)	1033	1178		930	1417			370				
Starvation Cap Reductn	0	0		0	0			0				
Spillback Cap Reductn	0	0		0	0			0				
Storage Cap Reductn	0	0		0	0			0				
Reduced v/c Ratio	0.02	0.29		0.11	0.18			0.30				

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 36 (40%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 10.5 — Intersection LOS: B
Intersection Capacity Utilization 53.6% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 18: Mason Farm Road & East Drive



UNC DP TIA 2023 — No-Build (2030) PM
19: Mason Farm Road & Purefoy Road — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	39	14	85	294	57
Future Volume (vph)	25	39	14	85	294	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.918				0.978	
Flt Protected	0.981			0.993		
Satd. Flow (prot)	1678	0	0	1850	1822	0
Flt Permitted	0.981			0.993		
Satd. Flow (perm)	1678	0	0	1850	1822	0
Link Speed (mph)	25			30	30	
Link Distance (ft)	563			318	480	
Travel Time (s)	15.4			7.2	10.9	
Confl. Peds. (#/hr)	15	22	7			7
Confl. Bikes (#/hr)		2				15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	43	16	94	327	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	71	0	0	110	390	0
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 35.1% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
19: Mason Farm Road & Purefoy Road — HCM 2010 AWSC

Intersection

Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	39	14	85	294	57
Future Vol, veh/h	25	39	14	85	294	57
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	43	16	94	327	63
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.2	8.3	10.3
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	14%	39%	0%
Vol Thru, %	86%	0%	84%
Vol Right, %	0%	61%	16%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	99	64	351
LT Vol	14	25	0
Through Vol	85	0	294
RT Vol	0	39	57
Lane Flow Rate	110	71	390
Geometry Grp	1	1	1
Degree of Util (X)	0.138	0.093	0.438
Departure Headway (Hd)	4.519	4.721	4.045
Convergence, Y/N	Yes	Yes	Yes
Cap	796	762	874
Service Time	2.528	2.728	2.14
HCM Lane V/C Ratio	0.138	0.093	0.446
HCM Control Delay	8.3	8.2	10.3
HCM Lane LOS	A	A	B
HCM 95th-tile Q	0.5	0.3	2.3

UNC DP TIA 2023 — No-Build (2030) PM
20: Skipper Bowles Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	842	12	47	191	11	197
Future Volume (vph)	842	12	47	191	11	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.998					0.850
Flt Protected				0.990	0.950	
Satd. Flow (prot)	3532	0	0	3504	1770	1583
Flt Permitted				0.990	0.950	
Satd. Flow (perm)	3532	0	0	3504	1770	1583
Link Speed (mph)	35			35	35	
Link Distance (ft)	336			902	340	
Travel Time (s)	6.5			17.6	6.6	
Confl. Peds. (#/hr)		16	16			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	936	13	52	212	12	219
Shared Lane Traffic (%)						
Lane Group Flow (vph)	949	0	0	264	12	219
Sign Control	Free			Free	Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 43.7% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
20: Skipper Bowles Drive & Manning Drive — HCM 2010 TWSC

Intersection
Int Delay, s/veh 3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	842	12	47	191	11	197
Future Vol, veh/h	842	12	47	191	11	197
Conflicting Peds, #/hr	0	16	16	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	936	13	52	212	12	219

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	965	0	1169	491
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	210	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	709	-	186	523
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	805	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	700	-	168	516
Mov Cap-2 Maneuver	-	-	-	-	168	-
Stage 1	-	-	-	-	329	-
Stage 2	-	-	-	-	737	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	17.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	168	516	-	-	700	-
HCM Lane V/C Ratio	0.073	0.424	-	-	0.075	-
HCM Control Delay (s)	28.1	17	-	-	10.6	0.3
HCM Lane LOS	D	C	-	-	B	A
HCM 95th %tile Q(veh)	0.2	2.1	-	-	0.2	-

UNC DP TIA 2023 — No-Build (2030) PM
21: Columbia Street & Purefoy Road — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	52	27	368	41	11	1121
Future Volume (vph)	52	27	368	41	11	1121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	250	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.954		0.986			
Flt Protected	0.968				0.950	
Satd. Flow (prot)	1720	0	1837	0	1770	1863
Flt Permitted	0.968				0.950	
Satd. Flow (perm)	1720	0	1837	0	1770	1863
Link Speed (mph)	25		25			25
Link Distance (ft)	654		109			397
Travel Time (s)	17.8		3.0			10.8
Confl. Peds. (#/hr)	12			3	3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	58	30	409	46	12	1246
Shared Lane Traffic (%)						
Lane Group Flow (vph)	88	0	455	0	12	1246
Sign Control	Stop		Free			Free

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 70.2% — ICU Level of Service C
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
21: Columbia Street & Purefoy Road — HCM 2010 TWSC

Intersection
Int Delay, s/veh 3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	52	27	368	41	11	1121
Future Vol, veh/h	52	27	368	41	11	1121
Conflicting Peds, #/hr	12	0	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	30	409	46	12	1246

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1717	435	0	0	458	0
Stage 1	435	-	-	-	-	-
Stage 2	1282	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	99	621	-	-	1103	-
Stage 1	653	-	-	-	-	-
Stage 2	260	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	97	619	-	-	1100	-
Mov Cap-2 Maneuver	97	-	-	-	-	-
Stage 1	652	-	-	-	-	-
Stage 2	255	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	70.2	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	136	1100	-
HCM Lane V/C Ratio	-	-	0.645	0.011	-
HCM Control Delay (s)	-	-	70.2	8.3	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	3.5	0	-

UNC DP TIA 2023 — No-Build (2030) PM
22: Columbia Street & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	887	3	41	324	373	0	0	749	374
Future Volume (vph)	0	0	0	887	3	41	324	373	0	0	749	374
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			2%			-2%	
Storage Length (ft)	0		0	600		600	250		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor				1.00	1.00		1.00					0.96
Frt						0.850						0.850
Flt Protected				0.950	0.953		0.950					
Satd. Flow (prot)	0	0	0	1656	1661	1560	1752	3504	0	0	3575	1599
Flt Permitted				0.950	0.953		0.193					
Satd. Flow (perm)	0	0	0	1648	1654	1560	355	3504	0	0	3575	1536
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						84						416
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1226			1188			609			378	
Travel Time (s)		33.4			32.4			16.6			10.3	
Confl. Peds. (#/hr)			3	3			4		3	3		4
Confl. Bikes (#/hr)												10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	986	3	46	360	414	0	0	832	416
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	493	496	46	360	414	0	0	832	416
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	7.0	10.0			10.0	10.0
Minimum Split (s)				29.8	29.8	29.8	12.8	28.1			16.1	16.1
Total Split (s)				50.0	50.0	50.0	29.2	70.0			40.8	40.8
Total Split (%)				41.7%	41.7%	41.7%	24.3%	58.3%			34.0%	34.0%
Maximum Green (s)				44.2	44.2	44.2	23.4	63.9			34.7	34.7
Yellow Time (s)				3.7	3.7	3.7	3.0	4.0			4.0	4.0
All-Red Time (s)				2.1	2.1	2.1	2.8	2.1			2.1	2.1
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				5.8	5.8	5.8	5.8	6.1			6.1	6.1
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				1.0	1.0	1.0	1.0	3.0			3.0	3.0
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0		7.0				
Flash Dont Walk (s)				17.0	17.0	17.0		15.0				
Pedestrian Calls (#/hr)				0	0	0		0				
Act Effct Green (s)				39.2	39.2	39.2	69.2	68.9			39.7	39.7
Actuated g/C Ratio				0.33	0.33	0.33	0.58	0.57			0.33	0.33

No-Build (2030) PM.syn — VHB

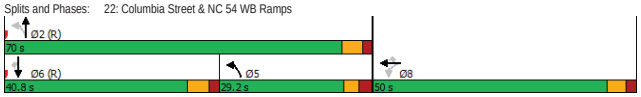
UNC DP TIA 2023 — No-Build (2030) PM
22: Columbia Street & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio				0.92	0.92	0.08	0.75	0.21			0.70	0.53
Control Delay				61.5	61.8	1.3	28.5	7.4			40.0	5.8
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				61.5	61.8	1.3	28.5	7.4			40.0	5.8
LOS				E	E	A	C	A			D	A
Approach Delay					59.0			17.2			28.6	
Approach LOS					E			B			C	
Queue Length 50th (ft)				373	376	0	95	31			302	0
Queue Length 95th (ft)				#544	#547	6	#295	39			393	79
Internal Link Dist (ft)		1146			1108			529			298	
Turn Bay Length (ft)				600		600	250					
Base Capacity (vph)				607	609	627	477	2012			1183	786
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.81	0.81	0.07	0.75	0.21			0.70	0.53

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 39 (33%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 36.0 — Intersection LOS: D
Intersection Capacity Utilization 79.8% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 22: Columbia Street & NC 54 WB Ramps



No-Build (2030) PM.syn — VHB

UNC DP TIA 2023 — No-Build (2030) PM
23: Columbia Street & NC 54 EB Ramps/Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	0	274	0	0	0	0	601	0	98	1571	0
Future Volume (vph)	116	0	274	0	0	0	0	601	0	98	1571	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			0%			3%			-6%	
Storage Length (ft)	250		250	0		0	0		0	250		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850									
Flt Protected	0.950	0.950								0.950		
Satd. Flow (prot)	1664	1664	1567	0	0	0	0	3486	0	1823	3645	0
Flt Permitted	0.950	0.950								0.341		
Satd. Flow (perm)	1664	1664	1567	0	0	0	0	3486	0	654	3645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			77									
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		975			270			219			609	
Travel Time (s)		22.2			6.1			6.0			16.6	
Confl. Peds. (#/hr)							7					7
Confl. Bikes (#/hr)									1			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	129	0	304	0	0	0	0	668	0	109	1746	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	64	65	304	0	0	0	0	668	0	109	1746	0
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	13.2	13.2	13.2					16.0		12.5	27.0	
Total Split (s)	39.0	39.0	39.0					68.0		13.0	81.0	
Total Split (%)	32.5%	32.5%	32.5%					56.7%		10.8%	67.5%	
Maximum Green (s)	32.8	32.8	32.8					62.0		7.5	75.0	
Yellow Time (s)	3.1	3.1	3.1					4.3		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.7		2.4	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2	6.2					6.0		5.5	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	2.0	2.0	2.0					3.0		1.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Walk Time (s)											7.0	
Flash Dont Walk (s)											14.0	
Pedestrian Calls (#/hr)											0	
Act Effct Green (s)	22.8	22.8	22.8					72.4		85.5	85.0	
Actuated g/C Ratio	0.19	0.19	0.19					0.60		0.71	0.71	

No-Build (2030) PM.syn — VHB

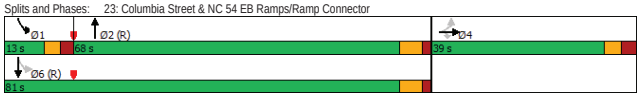
UNC DP TIA 2023 — No-Build (2030) PM
23: Columbia Street & NC 54 EB Ramps/Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.20	0.21	0.84					0.32		0.20	0.68	
Control Delay	39.6	39.7	54.8					5.3		0.9	2.0	
Queue Delay	0.0	0.0	0.0					0.0		0.0	0.2	
Total Delay	39.6	39.7	54.8					5.3		0.9	2.2	
LOS	D	D	D					A		A	A	
Approach Delay		50.3						5.3			2.2	
Approach LOS		D						A			A	
Queue Length 50th (ft)	44	45	174					53		0	4	
Queue Length 95th (ft)	77	80	255					m74		m7	188	
Internal Link Dist (ft)		895					190	139			529	
Turn Bay Length (ft)	250		250							250		
Base Capacity (vph)	454	454	484					2103		539	2582	
Starvation Cap Reductn	0	0	0					0		0	210	
Spillback Cap Reductn	0	0	0					0		0	39	
Storage Cap Reductn	0	0	0					0		0	0	
Reduced v/c Ratio	0.14	0.14	0.63					0.32		0.20	0.74	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 28 (23%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 9.9 — Intersection LOS: A
Intersection Capacity Utilization 79.8% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Columbia Street & NC 54 EB Ramps/Ramp Connector



No-Build (2030) PM.syn — VHB

UNC DP TIA 2023 — No-Build (2030) PM
24: Fordham Blvd & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Volume (vph)	0	1565	2120	50	0	112
Future Volume (vph)	0	1565	2120	50	0	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.997			0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3529	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	3529	0	0	1611
Link Speed (mph)		45	45		30	
Link Distance (ft)		1661	919		168	
Travel Time (s)		25.2	13.9		3.8	
Confl. Peds. (#/hr)					1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1739	2356	56	0	124
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1739	2412	0	0	124
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 73.8%		ICU Level of Service D	
Analysis Period (min) 15			

UNC DP TIA 2023 — No-Build (2030) PM
24: Fordham Blvd & Mason Farm Road — HCM 2010 TWSC

Intersection

Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Vol, veh/h	0	1565	2120	50	0	112
Future Vol, veh/h	0	1565	2120	50	0	112
Conflicting Peds, #/hr	0	0	0	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1739	2356	56	0	124

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1206
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	176
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	176
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	63.7
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	176
HCM Lane V/C Ratio	-	-	-	0.707
HCM Control Delay (s)	-	-	-	63.7
HCM Lane LOS	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	4.3

UNC DP TIA 2023 — No-Build (2030) PM
25: Manning Drive & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑	↳	↰	↑↑	↱		↑	↱	↰↰	↑	↱
Traffic Volume (vph)	92	1581	1	15	1962	113	13	0	22	846	3	236
Future Volume (vph)	92	1581	1	15	1962	113	13	0	22	846	3	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			0%			0%			-4%	
Storage Length (ft)	350		0	150		900	0		75	500		400
Storage Lanes	2		0	1		1	0		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor		1.00		1.00		0.99		0.97				0.98
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950				0.950		0.950		
Satd. Flow (prot)	3519	3628	0	1770	3539	1583	0	1770	1583	3502	1900	1615
Flt Permitted	0.950			0.950				0.950		0.950		
Satd. Flow (perm)	3519	3628	0	1765	3539	1563	0	1723	1583	3502	1900	1584
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						126			133			236
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		455			1093			556			574	
Travel Time (s)		6.9			16.6			15.2			11.2	
Confl. Peds. (#/hr)			3	3			4					4
Confl. Bikes (#/hr)						3						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	102	1757	1	17	2180	126	14	0	24	940	3	262
Shared Lane Traffic (%)												
Lane Group Flow (vph)	102	1758	0	17	2180	126	0	14	24	940	3	262
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6	4	3	3		4	4	
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	7.0	12.0	7.0	7.0	7.0	12.0	12.0	12.0
Minimum Split (s)	31.2	18.1		13.2	18.3	31.2	13.2	13.2	13.2	31.2	31.2	31.2
Total Split (s)	31.2	107.6		13.2	89.6	46.0	13.2	13.2	13.2	46.0	46.0	46.0
Total Split (%)	17.3%	59.8%		7.3%	49.8%	25.6%	7.3%	7.3%	7.3%	25.6%	25.6%	25.6%
Maximum Green (s)	25.0	101.5		7.0	83.3	39.8	7.0	7.0	7.0	39.8	39.8	39.8
Yellow Time (s)	3.0	4.7		3.0	4.5	3.8	3.8	3.8	3.8	3.8	3.8	3.8
All-Red Time (s)	3.2	1.4		3.2	1.8	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.2	-1.1		-1.2	-1.3	-1.2		-1.2	-1.2	-1.2	-1.2	-1.2
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?		Yes				Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	6.0		1.0	1.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Gap (s)	3.0	3.0		2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	20.0		0.0	0.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Time To Reduce (s)	0.0	60.0		0.0	0.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None
Walk Time (s)	7.0											
Flash Dont Walk (s)	18.0											

UNC DP TIA 2023 — No-Build (2030) PM
25: Manning Drive & Fordham Blvd — Lanes, Volumes, Timings

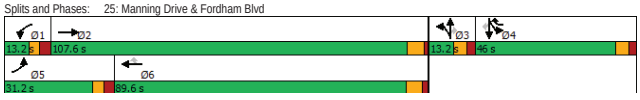
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)		4										
Act Effct Green (s)	12.4	99.1		8.2	89.2	130.4		8.2	8.2	41.2	41.2	41.2
Actuated g/C Ratio	0.07	0.59		0.05	0.53	0.78		0.05	0.05	0.24	0.24	0.24
v/c Ratio	0.39	0.82		0.20	1.16	0.10		0.16	0.12	1.10	0.01	0.46
Control Delay	79.2	33.2		86.8	115.3	0.7		85.7	1.2	117.3	53.3	11.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	79.2	33.2		86.8	115.3	0.7		85.7	1.2	117.3	53.3	11.9
LOS	E	C		F	F	A		F	A	F	D	B
Approach Delay		35.7			108.9			32.3			94.2	
Approach LOS		D			F			C			F	
Queue Length 50th (ft)	58	890		19	~1494	0		15	0	~615	3	23
Queue Length 95th (ft)	87	995		50	#1852	14		45	0	#819	13	114
Internal Link Dist (ft)		375			1013			476			494	
Turn Bay Length (ft)	350			150		900			75	500		400
Base Capacity (vph)	551	2224		86	1876	1245		86	204	858	465	566
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.19	0.79		0.20	1.16	0.10		0.16	0.12	1.10	0.01	0.46

Intersection Summary

Area Type:	Other		
Cycle Length: 180			
Actuated Cycle Length: 168.2			
Natural Cycle: 145			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 80.0		Intersection LOS: F	
Intersection Capacity Utilization 93.4%		ICU Level of Service F	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 25: Manning Drive & Fordham Blvd



UNC DP TIA 2023 — No-Build (2030) PM
26: Oteys Road & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	82	120	3	38	5	10	1	0	10	7	23
Future Volume (vph)	11	82	120	3	38	5	10	1	0	10	7	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	10	10	12	10	12	10	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.924			0.984						0.922	
Flt Protected		0.997			0.997			0.956			0.988	
Satd. Flow (prot)	0	1602	0	0	1706	0	0	1781	0	0	1697	0
Flt Permitted		0.997			0.997			0.956			0.988	
Satd. Flow (perm)	0	1602	0	0	1706	0	0	1781	0	0	1697	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1056			735			360			184	
Travel Time (s)		28.8			20.0			9.8			5.0	
Confl. Peds. (#/hr)	28					28	2					2
Confl. Bikes (#/hr)			4									3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	91	133	3	42	6	11	1	0	11	8	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	236	0	0	51	0	0	12	0	0	45	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 25.7% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
26: Oteys Road & Mason Farm Road — HCM 2010 AWSC

Intersection

Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	82	120	3	38	5	10	1	0	10	7	23
Future Vol, veh/h	11	82	120	3	38	5	10	1	0	10	7	23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	91	133	3	42	6	11	1	0	11	8	26
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	7.5	7.8	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	91%	5%	7%	25%
Vol Thru, %	9%	38%	83%	18%
Vol Right, %	0%	56%	11%	57%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	11	213	46	40
LT Vol	10	11	3	10
Through Vol	1	82	38	7
RT Vol	0	120	5	23
Lane Flow Rate	12	237	51	44
Geometry Grp	1	1	1	1
Degree of Util (X)	0.016	0.246	0.059	0.051
Departure Headway (Hd)	4.755	3.744	4.161	4.142
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	757	954	853	849
Service Time	2.755	1.787	2.225	2.241
HCM Lane V/C Ratio	0.016	0.248	0.06	0.052
HCM Control Delay	7.8	8	7.5	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	1	0.2	0.2

UNC DP TIA 2023 — No-Build (2030) PM
27: Boundary Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	559	11	27	791	138	12	71	103	70	17	6
Future Volume (vph)	16	559	11	27	791	138	12	71	103	70	17	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	12	11	11	12
Grade (%)		-3%			1%			2%			-1%	
Storage Length (ft)	0		0	0		0	50		0	75		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.99	0.99			0.99	
Frt		0.997			0.978			0.911			0.960	
Flt Protected		0.999			0.999		0.950			0.950		
Satd. Flow (prot)	0	3577	0	0	3424	0	1694	1610	0	1754	1761	0
Flt Permitted		0.919			0.927		0.740			0.578		
Satd. Flow (perm)	0	3290	0	0	3177	0	1306	1610	0	1067	1761	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			46			114			7	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1100			226			551			371	
Travel Time (s)		30.0			6.2			15.0			10.1	
Confl. Peds. (#/hr)	10					10	12					12
Confl. Bikes (#/hr)			1			3			5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	18	621	12	30	879	153	13	79	114	78	19	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	651	0	0	1062	0	13	193	0	78	26	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.4	15.4		15.6	15.6		12.6	12.6		24.7	24.7	
Total Split (s)	30.3	30.3		30.3	30.3		24.7	24.7		24.7	24.7	
Total Split (%)	55.1%	55.1%		55.1%	55.1%		44.9%	44.9%		44.9%	44.9%	
Maximum Green (s)	24.9	24.9		24.7	24.7		19.1	19.1		19.0	19.0	
Yellow Time (s)	3.7	3.7		3.5	3.5		3.7	3.7		3.9	3.9	
All-Red Time (s)	1.7	1.7		2.1	2.1		1.9	1.9		1.8	1.8	
Lost Time Adjust (s)		-0.4			-0.6		-0.6	-0.6		-0.7	-0.7	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		1.0	1.0		1.0	1.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										12.0	12.0	
Pedestrian Calls (#/hr)										0	0	

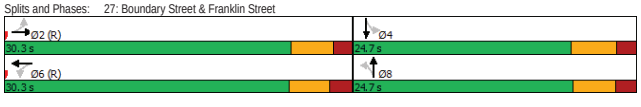
UNC DP TIA 2023 — No-Build (2030) PM
27: Boundary Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		39.5			39.5		9.0	9.0		9.0	9.0	
Actuated g/C Ratio		0.72			0.72		0.16	0.16		0.16	0.16	
v/c Ratio		0.28			0.46		0.06	0.54		0.45	0.09	
Control Delay		2.1			5.4		18.8	15.4		28.8	16.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		2.1			5.4		18.8	15.4		28.8	16.0	
LOS		A			A		B	B		C	B	
Approach Delay		2.1			5.4			15.6			25.6	
Approach LOS		A			A			B			C	
Queue Length 50th (ft)		19			64		4	24		24	6	
Queue Length 95th (ft)		34			133		15	67		54	21	
Internal Link Dist (ft)		1020			146			471			291	
Turn Bay Length (ft)							50			75		
Base Capacity (vph)		2366			2297		467	649		382	635	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.28			0.46		0.03	0.30		0.20	0.04	

Intersection Summary

Area Type: Other
Cycle Length: 55
Actuated Cycle Length: 55
Offset: 33 (60%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 6.4 — Intersection LOS: A
Intersection Capacity Utilization 74.7% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 27: Boundary Street & Franklin Street



UNC DP TIA 2023 — No-Build (2030) PM
28: Park Place & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	728	2	22	960	0	59
Future Volume (vph)	728	2	22	960	0	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	9	12
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt					0.865	
Flt Protected				0.999		
Satd. Flow (prot)	3539	0	0	3536	1450	0
Flt Permitted				0.999		
Satd. Flow (perm)	3539	0	0	3536	1450	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	461			1129	375	
Travel Time (s)	12.6			30.8	10.2	
Confl. Peds. (#/hr)		11	11			
Confl. Bikes (#/hr)		6				4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	809	2	24	1067	0	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	811	0	0	1091	66	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

UNC DP TIA 2023 — No-Build (2030) PM
28: Park Place & Franklin Street — HCM 2010 TWSC

Intersection

Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	728	2	22	960	0	59
Future Vol, veh/h	728	2	22	960	0	59
Conflicting Peds, #/hr	0	11	11	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	809	2	24	1067	0	66

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	822	0	1403	417
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	582	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	803	-	131	585
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	522	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	797	-	121	581
Mov Cap-2 Maneuver	-	-	-	-	121	-
Stage 1	-	-	-	-	390	-
Stage 2	-	-	-	-	483	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	581	-	-	797	-
HCM Lane V/C Ratio	0.113	-	-	0.031	-
HCM Control Delay (s)	12	-	-	9.7	0.3
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

UNC DP TIA 2023 — No-Build (2030) PM
29: Battle Lane & Boundary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	65	34	0	0	144	106	1	88	23
Future Volume (vph)	0	0	0	65	34	0	0	144	106	1	88	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt								0.943			0.972	
Flt Protected					0.968							
Satd. Flow (prot)	0	0	0	0	1803	0	0	1757	0	0	1811	0
Flt Permitted					0.968							
Satd. Flow (perm)	0	0	0	0	1803	0	0	1757	0	0	1811	0
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		81			509			63			394	
Travel Time (s)		1.8			13.9			1.7			10.7	
Confl. Peds. (#/hr)			88			34	2		56	56		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	72	38	0	0	160	118	1	98	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	110	0	0	278	0	0	125	0
Sign Control		Stop			Stop			Yield			Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		

UNC DP TIA 2023 — No-Build (2030) PM
30: Country Club Road & Battle Lane — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	96	421	425	255	153	0
Future Volume (vph)	96	421	425	255	153	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.949			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1768	0	1770	0
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1768	0	1770	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		90	508		63	
Travel Time (s)		2.5	13.9		1.7	
Confl. Peds. (#/hr)	34			56		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	107	468	472	283	170	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	107	468	755	0	170	0
Sign Control		Free	Free		Yield	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

UNC DP TIA 2023 — No-Build (2030) PM
31: Country Club Road & Paul Green Theater Drive/Gimghoul Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	2	61	11	2	9	21	614	5	7	526	20
Future Volume (vph)	29	2	61	11	2	9	21	614	5	7	526	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			2%			1%			1%	
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95			0.96		0.94	1.00			0.99	
Frt		0.910			0.944			0.999			0.995	
Flt Protected		0.985			0.976		0.950				0.999	
Satd. Flow (prot)	0	1658	0	0	1643	0	1761	1851	0	0	1827	0
Flt Permitted		0.886			0.760		0.447				0.992	
Satd. Flow (perm)	0	1467	0	0	1266	0	780	1851	0	0	1814	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		68			10			1			5	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		153			324			421			824	
Travel Time (s)		4.2			8.8			11.5			22.5	
Confl. Peds. (#/hr)	16		9	9		16	43		6	6		43
Confl. Bikes (#/hr)						3						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	32	2	68	12	2	10	23	682	6	8	584	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	102	0	0	24	0	23	688	0	0	614	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2	2	
Detector Phase	8	8		4	4		6	6		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	21.0	21.0		18.6	18.6		15.1	15.1		15.1	15.1	
Total Split (s)	23.0	23.0		23.0	23.0		67.0	67.0		67.0	67.0	
Total Split (%)	25.6%	25.6%		25.6%	25.6%		74.4%	74.4%		74.4%	74.4%	
Maximum Green (s)	17.0	17.0		17.4	17.4		61.9	61.9		61.9	61.9	
Yellow Time (s)	3.5	3.5		3.1	3.1		3.1	3.1		3.1	3.1	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-0.6		-0.1	-0.1			-0.1	
Total Lost Time (s)		5.0			5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	11.0	11.0		9.0	9.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		9.3			9.2		74.3	74.3			74.3	
Actuated g/C Ratio		0.10			0.10		0.83	0.83			0.83	

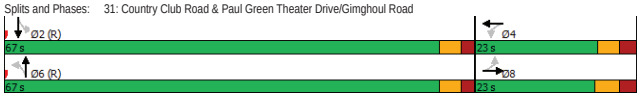
UNC DP TIA 2023 — No-Build (2030) PM
31: Country Club Road & Paul Green Theater Drive/Gimghoul Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.48			0.17		0.04	0.45			0.41	
Control Delay		23.5			28.5		2.7	4.3			2.4	
Queue Delay		0.0			0.0		0.0	1.0			0.0	
Total Delay		23.5			28.5		2.7	5.3			2.4	
LOS		C			C		A	A			A	
Approach Delay		23.5			28.5			5.2			2.4	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		18			7		2	91			57	
Queue Length 95th (ft)		64			30		8	188			38	
Internal Link Dist (ft)		73			244			341			744	
Turn Bay Length (ft)							50					
Base Capacity (vph)		347			261		644	1529			1499	
Starvation Cap Reductn		0			0		0	550			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.29			0.09		0.04	0.70			0.41	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 14 (16%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 5.7 — Intersection LOS: A
Intersection Capacity Utilization 51.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 31: Country Club Road & Paul Green Theater Drive/Gimghoul Road



No-Build (2030) PM.syn VHB

UNC DP TIA 2023 — No-Build (2030) PM
32: Hibbard Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	561	9	18	525	39	22	2	40	28	22	62
Future Volume (vph)	28	561	9	18	525	39	22	2	40	28	22	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			2%			-5%			-2%	
Storage Length (ft)	150		0	75		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.82	0.99		0.83	0.96			0.79			0.90	
Frt		0.998			0.990			0.915			0.925	
Flt Protected	0.950			0.950				0.983			0.988	
Satd. Flow (prot)	1778	3526	0	1752	3345	0	0	1382	0	0	1654	0
Flt Permitted	0.406			0.412				0.838			0.910	
Satd. Flow (perm)	624	3526	0	628	3345	0	0	1160	0	0	1418	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			12			44			69	
Link Speed (mph)		25			25			25			20	
Link Distance (ft)		469			330			188			294	
Travel Time (s)		12.8			9.0			5.1			10.0	
Confl. Peds. (#/hr)	259		155	155		259	59		354	354		59
Confl. Bikes (#/hr)			1			2						6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	31	623	10	20	583	43	24	2	44	31	24	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	633	0	20	626	0	0	70	0	0	124	0
Turn Type	D.P+P	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.3	18.5		22.5	22.5		29.3	29.3		29.3	29.3	
Total Split (s)	12.3	40.7		28.4	28.4		29.3	29.3		29.3	29.3	
Total Split (%)	17.6%	58.1%		40.6%	40.6%		41.9%	41.9%		41.9%	41.9%	
Maximum Green (s)	7.0	35.2		22.9	22.9		23.0	23.0		23.0	23.0	
Yellow Time (s)	3.0	3.2		3.2	3.2		3.5	3.5		3.0	3.0	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.8	2.8		3.3	3.3	
Lost Time Adjust (s)	-0.1	-0.3		-0.4	-0.4			-1.3			-1.3	
Total Lost Time (s)	5.2	5.2		5.1	5.1			5.0			5.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		6.0		10.0	10.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	50.5	53.6		48.8	48.8			9.9			9.9	
Actuated g/C Ratio	0.72	0.77		0.70	0.70			0.14			0.14	

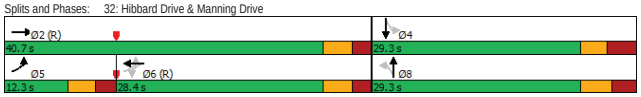
UNC DP TIA 2023 — No-Build (2030) PM
32: Hibbard Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.05	0.23		0.05	0.27			0.35			0.48	
Control Delay	2.2	1.7		6.4	5.0			18.1			20.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	2.2	1.7		6.4	5.0			18.1			20.0	
LOS	A	A		A	A			B			C	
Approach Delay		1.8			5.1			18.1			20.0	
Approach LOS		A			A			B			C	
Queue Length 50th (ft)	2	20		1	24			10			22	
Queue Length 95th (ft)	m4	32		10	67			42			64	
Internal Link Dist (ft)		389			250			108			214	
Turn Bay Length (ft)	150			75								
Base Capacity (vph)	567	2701		437	2334			431			537	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.05	0.23		0.05	0.27			0.16			0.23	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 63 (90%), Referenced to phase 2:EBT and 6:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 5.4 — Intersection LOS: A
Intersection Capacity Utilization 50.9% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 32: Hibbard Drive & Manning Drive



No-Build (2030) PM.syn VHB

UNC DP TIA 2023 — No-Build (2030) PM
33: Paul Harden Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	771	18	24	433	28	34	7	149	21	16	12
Future Volume (vph)	16	771	18	24	433	28	34	7	149	21	16	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	12	10	10	12
Grade (%)		-2%			2%			8%			-11%	
Storage Length (ft)	200		0	0		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93	1.00		0.98	0.99		0.84	0.74		0.79	0.93	
Frt		0.997			0.991			0.857			0.937	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3556	0	1752	3437	0	1586	1058	0	1742	1595	0
Flt Permitted	0.463			0.289			0.737			0.576		
Satd. Flow (perm)	814	3556	0	525	3437	0	1039	1058	0	837	1595	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			10			166			13	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		433			267			379			301	
Travel Time (s)		11.8			7.3			10.3			8.2	
Confl. Peds. (#/hr)	72		38	38		72	185		290	290		185
Confl. Bikes (#/hr)			2			1			3			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	18	857	20	27	481	31	38	8	166	23	18	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	877	0	27	512	0	38	174	0	23	31	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.9	23.1		11.9	22.1		28.8	28.8		30.3	30.3	
Total Split (s)	11.9	27.8		11.9	27.8		30.3	30.3		30.3	30.3	
Total Split (%)	17.0%	39.7%		17.0%	39.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	7.0	22.7		7.0	22.7		24.5	24.5		24.0	24.0	
Yellow Time (s)	3.0	3.3		3.0	3.3		3.0	3.0		3.5	3.5	
All-Red Time (s)	1.9	1.8		1.9	1.8		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.2	-0.1		0.1	0.1		-0.4	-0.4		-0.9	-0.9	
Total Lost Time (s)	5.1	5.0		5.0	5.2		5.4	5.4		5.4	5.4	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			10.0		16.0	16.0		17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	48.9	45.2		48.0	47.4		9.6	9.6		9.6	9.6	

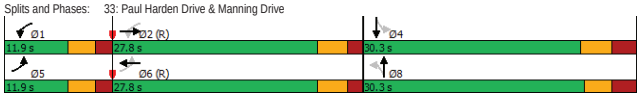
UNC DP TIA 2023 — No-Build (2030) PM
33: Paul Harden Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.70	0.65		0.69	0.68		0.14	0.14		0.14	0.14	
v/c Ratio	0.03	0.38		0.06	0.22		0.27	0.60		0.20	0.13	
Control Delay	3.8	7.7		4.1	5.8		30.7	15.0		29.6	19.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.8	7.7		4.1	5.8		30.7	15.0		29.6	19.0	
LOS	A	A		A	A		C	B		C	B	
Approach Delay		7.6			5.7			17.8			23.5	
Approach LOS		A			A			B			C	
Queue Length 50th (ft)	2	48		2	26		15	3		9	7	
Queue Length 95th (ft)	7	157		11	99		38	52		27	26	
Internal Link Dist (ft)		353			187			299			221	
Turn Bay Length (ft)	200						75			100		
Base Capacity (vph)	662	2299		480	2331		369	483		297	575	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.38		0.06	0.22		0.10	0.36		0.08	0.05	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 55 (79%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 8.8 — Intersection LOS: A
Intersection Capacity Utilization 50.6% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 33: Paul Harden Drive & Manning Drive



UNC DP TIA 2023 — No-Build (2030) PM
34: East Drive & Dogwood Deck Entrance/Jackson Circle — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	1	0	6	7	536	1	4	61	83
Future Volume (vph)	0	0	0	1	0	6	7	536	1	4	61	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	12	12	10	12	12
Storage Length (ft)	0		0	0		0	100		0	75		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.882					0.914		
Flt Protected					0.994		0.950			0.950		
Satd. Flow (prot)	0	0	0	0	1633	0	1652	1863	0	1652	1703	0
Flt Permitted					0.994		0.950			0.950		
Satd. Flow (perm)	0	0	0	0	1633	0	1652	1863	0	1652	1703	0
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		321			259			210			315	
Travel Time (s)		7.3			7.1			5.7			8.6	
Confl. Peds. (#/hr)	21		3	3		21	13					13
Confl. Bikes (#/hr)												3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1	0	7	8	596	1	4	68	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	8	0	8	597	0	4	160	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 43.3% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
34: East Drive & Dogwood Deck Entrance/Jackson Circle — HCM 2010 TWSC

Intersection

Int Delay, s/veh 0.2

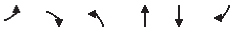
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	0	6	7	536	1	4	61	83
Future Vol, veh/h	0	0	0	1	0	6	7	536	1	4	61	83
Conflicting Peds, #/hr	21	0	3	3	0	21	13	0	0	0	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-	262	144	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	1	0	7	8	596	1	4	68	92

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	738	794	618	173	0	0	597	0	0
Stage 1	613	613	-	-	-	-	-	-	-
Stage 2	125	181	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	385	321	489	1404	-	-	980	-	-
Stage 1	541	483	-	-	-	-	-	-	-
Stage 2	901	750	-	-	-	-	-	-	-
Platoon blocked, %						-		-	-
Mov Cap-1 Maneuver	380	0	480	1404	-	-	980	-	-
Mov Cap-2 Maneuver	380	0	-	-	-	-	-	-	-
Stage 1	538	0	-	-	-	-	-	-	-
Stage 2	896	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.9	0.1	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1404	-	-	463	980	-	-
HCM Lane V/C Ratio	0.006	-	-	0.017	0.005	-	-
HCM Control Delay (s)	7.6	-	-	12.9	8.7	-	-
HCM Lane LOS	A	-	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	-	-

UNC DP TIA 2023 — No-Build (2030) PM
35: East Drive & Dogwood Deck Exit — Lanes, Volumes, Timings



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	240	162	0	214	62	0
Future Volume (vph)	240	162	0	214	62	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1770	1583	0	1863	1863	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	1583	0	1863	1863	0
Link Speed (mph)	30			25	30	
Link Distance (ft)	134			176	210	
Travel Time (s)	3.0			4.8	4.8	
Confl. Peds. (#/hr)	2	3	15			15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	267	180	0	238	69	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	267	180	0	238	69	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other		
Control Type:	Unsignalized		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

UNC DP TIA 2023 — No-Build (2030) PM
35: East Drive & Dogwood Deck Exit — HCM 2010 TWSC

Intersection

Int Delay, s/veh	7.1

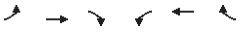
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	240	162	0	214	62	0
Future Vol, veh/h	240	162	0	214	62	0
Conflicting Peds, #/hr	2	3	15	0	0	15
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	267	180	0	238	69	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	309	72	-	0	-	0
Stage 1	69	-	-	-	-	-
Stage 2	240	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	683	990	0	-	-	0
Stage 1	954	-	0	-	-	0
Stage 2	800	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	683	988	-	-	-	-
Mov Cap-2 Maneuver	683	-	-	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	800	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	683	988	-
HCM Lane V/C Ratio	-	0.39	0.182	-
HCM Control Delay (s)	-	13.6	9.5	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	1.9	0.7	-

UNC DP TIA 2023 — No-Build (2030) PM
36: Mason Farm Road & Hibbard Drive — Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	170	1	0	77	35	3	3	10	134	0	38
Future Volume (vph)	17	170	1	0	77	35	3	3	10	134	0	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.958			0.913			0.970	
Flt Protected		0.995						0.991			0.962	
Satd. Flow (prot)	0	1790	0	0	1725	0	0	1573	0	0	1622	0
Flt Permitted		0.995						0.991			0.962	
Satd. Flow (perm)	0	1790	0	0	1725	0	0	1573	0	0	1622	0
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		221			213			480			560	
Travel Time (s)		6.0			5.8			10.9			15.3	
Confl. Peds. (#/hr)							33		73	73		33
Confl. Bikes (#/hr)						8			1			10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	19	189	1	0	86	39	3	3	11	149	0	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	209	0	0	125	0	0	17	0	0	191	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other		
Control Type:	Unsignalized		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

UNC DP TIA 2023 — No-Build (2030) PM
36: Mason Farm Road & Hibbard Drive — HCM 2010 TWSC

Intersection

Int Delay, s/veh	14.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	170	1	0	77	35	3	3	10	134	0	38
Future Vol, veh/h	17	170	1	0	77	35	3	3	10	134	0	38
Conflicting Peds, #/hr	0	0	0	0	0	0	33	0	73	73	0	33
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	19	189	1	0	86	39	3	3	11	149	0	42

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	429	445	54	502	461	82	75	0	0	87	0	0
Stage 1	352	352	-	88	88	-	-	-	-	-	-	-
Stage 2	77	93	-	414	373	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	536	508	1013	480	497	978	1524	-	-	1509	-	-
Stage 1	665	632	-	920	822	-	-	-	-	-	-	-
Stage 2	932	818	-	616	618	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	385	416	987	269	407	923	1486	-	-	1425	-	-
Mov Cap-2 Maneuver	385	416	-	269	407	-	-	-	-	-	-	-
Stage 1	647	550	-	867	774	-	-	-	-	-	-	-
Stage 2	792	771	-	360	538	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.2	14.8	1.4	6.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1486	-	-	414	493	1425	-	-
HCM Lane V/C Ratio	0.002	-	-	0.505	0.252	0.104	-	-
HCM Control Delay (s)	7.4	0	-	22.2	14.8	7.8	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.8	1	0.3	-	-

UNC DP TIA 2023 — No-Build (2030) PM
37: Bell Tower Drive & South Road — Lanes, Volumes, Timings

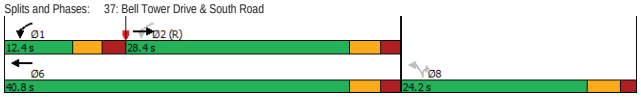
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	427	45	49	476	133	106
Future Volume (vph)	427	45	49	476	133	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	50		0	100
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.96		0.88		0.42	0.72
Frt	0.987					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1768	0	1770	1863	1770	1583
Flt Permitted			0.317		0.950	
Satd. Flow (perm)	1768	0	521	1863	742	1136
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	9					118
Link Speed (mph)	25			25	30	
Link Distance (ft)	696			744	512	
Travel Time (s)	19.0			20.3	11.6	
Confl. Peds. (#/hr)		199	199		472	135
Confl. Bikes (#/hr)		16				10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	474	50	54	529	148	118
Shared Lane Traffic (%)						
Lane Group Flow (vph)	524	0	54	529	148	118
Turn Type	NA		D.P+P	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			2		8	8
Detector Phase	2		1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	7.0	7.0
Minimum Split (s)	22.4		12.4	15.4	22.5	22.5
Total Split (s)	28.4		12.4	40.8	24.2	24.2
Total Split (%)	43.7%		19.1%	62.8%	37.2%	37.2%
Maximum Green (s)	23.0		7.0	35.4	19.1	19.1
Yellow Time (s)	3.3		3.0	3.3	3.4	3.4
All-Red Time (s)	2.1		2.4	2.1	1.7	1.7
Lost Time Adjust (s)	-0.5		-0.4	-0.4	-0.1	-0.1
Total Lost Time (s)	4.9		5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?			Yes			
Vehicle Extension (s)	3.0		1.0	3.0	2.0	2.0
Recall Mode	C-Min		None	Min	None	None
Walk Time (s)	7.0				7.0	7.0
Flash Dont Walk (s)	10.0				10.0	10.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	31.8		36.2	39.2	15.8	15.8
Actuated g/C Ratio	0.49		0.56	0.60	0.24	0.24
v/c Ratio	0.60		0.12	0.47	0.82	0.32

UNC DP TIA 2023 — No-Build (2030) PM
37: Bell Tower Drive & South Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	15.2		7.4	9.9	57.3	6.7
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	15.2		7.4	9.9	57.3	6.7
LOS	B		A	A	E	A
Approach Delay	15.2			9.6	34.8	
Approach LOS	B			A	C	
Queue Length 50th (ft)	100		9	114	52	0
Queue Length 95th (ft)	#173		23	194	#133	33
Internal Link Dist (ft)	616			664	432	
Turn Bay Length (ft)			50			100
Base Capacity (vph)	870		432	1123	219	418
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.60		0.13	0.47	0.68	0.28

Intersection Summary
Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Offset: 36 (55%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 16.7 — Intersection LOS: B
Intersection Capacity Utilization 58.3% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 37: Bell Tower Drive & South Road



UNC DP TIA 2023 — No-Build (2030) PM
38: Manning Drive & Hospital Exit — Lanes, Volumes, Timings

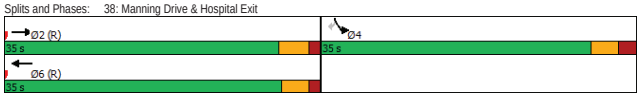
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	217	526	0	76	51
Future Volume (vph)	0	217	526	0	76	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					0.96	0.97
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3539	3539	0	1770	1583
Flt Permitted					0.950	
Satd. Flow (perm)	0	3539	3539	0	1707	1535
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						57
Link Speed (mph)		35	35		20	
Link Distance (ft)		334	382		292	
Travel Time (s)		6.5	7.4		10.0	
Confl. Peds. (#/hr)	165			165	44	23
Confl. Bikes (#/hr)				1		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	241	584	0	84	57
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	241	584	0	84	57
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		10.0	10.0		7.0	7.0
Minimum Split (s)		14.7	19.4		31.1	31.1
Total Split (s)		35.0	35.0		35.0	35.0
Total Split (%)		50.0%	50.0%		50.0%	50.0%
Maximum Green (s)		30.3	30.6		29.9	29.9
Yellow Time (s)		3.3	3.0		3.0	3.0
All-Red Time (s)		1.4	1.4		2.1	2.1
Lost Time Adjust (s)		0.3	0.6		-0.1	-0.1
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		2.0	2.0		2.0	2.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		19.0	19.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		54.9	54.9		8.5	8.5
Actuated g/C Ratio		0.78	0.78		0.12	0.12
v/c Ratio		0.09	0.21		0.39	0.24
Control Delay		2.2	2.0		33.4	11.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		2.2	2.0		33.4	11.0

UNC DP TIA 2023 — No-Build (2030) PM
38: Manning Drive & Hospital Exit — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
LOS		A	A		C	B
Approach Delay		2.2	2.0		24.3	
Approach LOS		A	A		C	
Queue Length 50th (ft)		10	58		34	0
Queue Length 95th (ft)		15	15		70	28
Internal Link Dist (ft)		254	302		212	
Turn Bay Length (ft)						
Base Capacity (vph)		2777	2777		758	690
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.09	0.21		0.11	0.08

Intersection Summary
Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 33 (47%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.39
Intersection Signal Delay: 5.3 — Intersection LOS: A
Intersection Capacity Utilization 37.2% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 38: Manning Drive & Hospital Exit



UNC DP TIA 2023 — No-Build (2030) PM
39: Craige Deck & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	589	11	16	426	103	208
Future Volume (vph)	589	11	16	426	103	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.997					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3529	0	1770	3539	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3529	0	1770	3539	1770	1583
Link Speed (mph)	25			25	15	
Link Distance (ft)	330			433	367	
Travel Time (s)	9.0			11.8	16.7	
Confl. Peds. (#/hr)		46	46		3	
Confl. Bikes (#/hr)		6				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	654	12	18	473	114	231
Shared Lane Traffic (%)						
Lane Group Flow (vph)	666	0	18	473	114	231
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 36.2% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
39: Craige Deck & Manning Drive — HCM 2010 TWSC

Intersection
Int Delay, s/veh 5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	589	11	16	426	103	208
Future Vol, veh/h	589	11	16	426	103	208
Conflicting Peds, #/hr	0	46	46	0	3	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	654	12	18	473	114	231

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	712	0	982	379
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	276	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	884	-	246	619
Stage 1	-	-	-	-	450	-
Stage 2	-	-	-	-	746	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	850	-	231	595
Mov Cap-2 Maneuver	-	-	-	-	231	-
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	729	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	21.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	231	595	-	-	850	-
HCM Lane V/C Ratio	0.495	0.388	-	-	0.021	-
HCM Control Delay (s)	35	14.8	-	-	9.3	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	2.5	1.8	-	-	0.1	-

UNC DP TIA 2023 — No-Build (2030) PM
101: US 15/501 & Estes Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	5	385	5	6	10	272	1544	2	12	1307	113
Future Volume (vph)	210	5	385	5	6	10	272	1544	2	12	1307	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		0	150		0	250		0	220		225
Storage Lanes	0		2	0		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.97	0.98		0.92							0.99
Frt			0.850		0.938							0.850
Flt Protected		0.954			0.988		0.950			0.950		
Satd. Flow (prot)	0	1760	2760	0	1569	0	3400	3505	0	1752	3505	1568
Flt Permitted		0.954			0.988		0.950			0.950		
Satd. Flow (perm)	0	1707	2701	0	1569	0	3400	3505	0	1752	3505	1548
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			156		11							81
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		1824			872			1606			1920	
Travel Time (s)		41.5			19.8			24.3			29.1	
Confl. Peds. (#/hr)	21					21						
Confl. Bikes (#/hr)			1			2						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	233	6	428	6	7	11	302	1716	2	13	1452	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	239	428	0	24	0	302	1718	0	13	1452	126
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	3	3	5	4	4		5	2		1	6	3
Permitted Phases			3									6
Detector Phase	3	3	5	4	4		5	2		1	6	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.6	13.6	13.7	13.7	13.7		13.7	18.1		13.5	18.1	13.6
Total Split (s)	42.0	42.0	29.0	13.7	13.7		29.0	110.8		13.5	95.3	42.0
Total Split (%)	23.3%	23.3%	16.1%	7.6%	7.6%		16.1%	61.6%		7.5%	52.9%	23.3%
Maximum Green (s)	35.4	35.4	22.3	7.0	7.0		22.3	104.7		7.0	89.2	35.4
Yellow Time (s)	3.8	3.8	3.0	3.2	3.2		3.0	4.4		3.0	4.6	3.8
All-Red Time (s)	2.8	2.8	3.7	3.5	3.5		3.7	1.7		3.5	1.5	2.8
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.6	6.7		6.7		6.7	6.1		6.5	6.1	6.6
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	3.0	1.0	1.0		3.0	6.0		3.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)		28.3	49.0		7.0		20.7	125.4		7.0	103.3	131.1

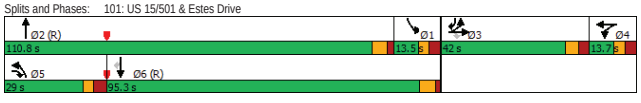
UNC DP TIA 2023 — No-Build (2030) PM
101: US 15/501 & Estes Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.16	0.27		0.04		0.12	0.70		0.04	0.57	0.73
v/c Ratio		0.87	0.50		0.34		0.77	0.70		0.19	0.72	0.11
Control Delay		101.7	28.0		67.1		90.9	21.8		75.1	19.3	0.3
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		101.7	28.0		67.1		90.9	21.8		75.1	19.3	0.3
LOS		F	C		E		F	C		E	B	A
Approach Delay		54.4			67.1			32.1			18.2	
Approach LOS		D			E			C			B	
Queue Length 50th (ft)		279	126		15		180	606		14	171	0
Queue Length 95th (ft)		374	166		51		237	960		m25	567	1
Internal Link Dist (ft)		1744			792			1526			1840	
Turn Bay Length (ft)							250			220		225
Base Capacity (vph)		346	883		71		428	2441		68	2011	1211
Starvation Cap Reductn		0	0		0		0	0		0	0	0
Spillback Cap Reductn		0	0		0		0	0		0	0	0
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		0.69	0.48		0.34		0.71	0.70		0.19	0.72	0.10

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 26 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 30.6 — Intersection LOS: C
Intersection Capacity Utilization 83.1% — ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: US 15/501 & Estes Drive



UNC DP TIA 2023 — No-Build (2030) PM
102: US 15/501 & Willow Drive — Lanes, Volumes, Timings

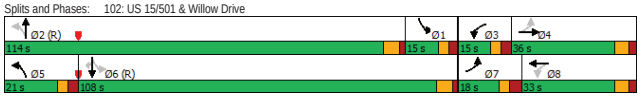
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	26	23	34	42	32	110	1556	87	44	1337	242
Future Volume (vph)	151	26	23	34	42	32	110	1556	87	44	1337	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	220		0	220		260
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.99		0.99	0.99							0.97
Frt		0.929			0.935			0.992				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1690	0	1752	1715	0	1752	3477	0	1752	3505	1568
Flt Permitted	0.403			0.721			0.107			0.080		
Satd. Flow (perm)	743	1690	0	1315	1715	0	197	3477	0	148	3505	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			18			6				181
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		1227			1197			1920			792	
Travel Time (s)		33.5			32.6			29.1			12.0	
Confl. Peds. (#/hr)			6	6			2					2
Confl. Bikes (#/hr)			4			1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	168	29	26	38	47	36	122	1729	97	49	1486	269
Shared Lane Traffic (%)												
Lane Group Flow (vph)	168	55	0	38	83	0	122	1826	0	49	1486	269
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	12.0
Minimum Split (s)	15.0	33.0		15.0	33.0		15.0	90.0		15.0	80.0	80.0
Total Split (s)	18.0	36.0		15.0	33.0		21.0	114.0		15.0	108.0	108.0
Total Split (%)	10.0%	20.0%		8.3%	18.3%		11.7%	63.3%		8.3%	60.0%	60.0%
Maximum Green (s)	11.7	29.6		9.1	26.6		14.9	107.9		9.4	101.9	101.9
Yellow Time (s)	3.0	3.9		3.0	3.9		3.0	4.6		3.0	4.6	4.6
All-Red Time (s)	3.3	2.5		2.9	2.5		3.1	1.5		2.6	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.4		5.9	6.4		6.1	6.1		5.6	6.1	6.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Walk Time (s)		4.0									5.0	5.0
Flash Dont Walk (s)		22.0									9.0	9.0
Pedestrian Calls (#/hr)		0									0	0
Act Effct Green (s)	25.0	14.6		20.0	11.5		126.0	126.0		121.8	121.3	121.3

UNC DP TIA 2023 — No-Build (2030) PM
102: US 15/501 & Willow Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.14	0.08		0.11	0.06		0.70	0.70		0.68	0.67	0.67
v/c Ratio	1.00	0.35		0.23	0.66		0.54	0.75		0.27	0.63	0.25
Control Delay	140.1	55.5		66.1	87.3		25.7	11.8		10.9	9.1	1.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.2	0.0
Total Delay	140.1	55.5		66.1	87.3		25.7	11.8		10.9	9.3	1.5
LOS	F	E		E	F		C	B		B	A	A
Approach Delay		119.2			80.6			12.7			8.2	
Approach LOS		F			F			B			A	
Queue Length 50th (ft)	187	38		39	76		36	352		9	144	7
Queue Length 95th (ft)	#322	88		76	138		m96	347		m18	213	13
Internal Link Dist (ft)		1147			1117			1840			712	
Turn Bay Length (ft)	200						220			220		260
Base Capacity (vph)	168	295		176	268		269	2434		183	2362	1081
Starvation Cap Reductn	0	0		0	0		0	0		0	263	0
Spillback Cap Reductn	0	0		0	0		0	15		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.00	0.19		0.22	0.31		0.45	0.75		0.27	0.71	0.25

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 22 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 18.5 — Intersection LOS: B
Intersection Capacity Utilization 82.9% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: US 15/501 & Willow Drive



UNC DP TIA 2023 — No-Build (2030) PM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	112	86	233	65	83	147	224	1387	181	6	107	1205
Future Volume (vph)	112	86	233	65	83	147	224	1387	181	6	107	1205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	525		150	350		150	350		175		225	
Storage Lanes	1		1	2		1	1		1		1	
Taper Length (ft)	25			25			25				25	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt			0.850			0.850			0.850			
Flt Protected	0.950			0.950			0.950				0.950	
Satd. Flow (prot)	1752	1863	1568	3433	1863	1583	1752	3505	1583	0	1769	3505
Flt Permitted	0.950			0.950			0.108				0.093	
Satd. Flow (perm)	1752	1863	1568	3433	1863	1583	199	3505	1583	0	173	3505
Right Turn on Red			Yes			Yes			Yes			
Satd. Flow (RTOR)			61			138			99			
Link Speed (mph)		30			30			45				45
Link Distance (ft)		828			647			792				1376
Travel Time (s)		18.8			14.7			12.0				20.8
Peak Hour Factor	0.90	0.92	0.90	0.92	0.92	0.92	0.90	0.90	0.92	0.90	0.92	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	103%	100%	100%
Heavy Vehicles (%)	3%	2%	3%	2%	2%	2%	3%	3%	2%	3%	2%	3%
Adj. Flow (vph)	124	93	259	71	90	160	249	1541	197	7	116	1339
Shared Lane Traffic (%)												
Lane Group Flow (vph)	124	93	259	71	90	160	249	1541	197	0	123	1339
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	7	4	5	3	8	1!	5	2	3	1!	1	6
Permitted Phases			4			8	6		2	2	2	
Detector Phase	7	4	5	3	8	1	5	2	3	1	1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	12.0
Minimum Split (s)	13.4	43.5	13.3	13.6	40.5	13.4	13.3	42.5	13.6	13.4	13.4	36.5
Total Split (s)	23.0	49.5	33.0	14.1	40.6	19.0	33.0	97.4	14.1	19.0	19.0	83.4
Total Split (%)	12.8%	27.5%	18.3%	7.8%	22.6%	10.6%	18.3%	54.1%	7.8%	10.6%	10.6%	46.3%
Maximum Green (s)	16.6	43.0	26.7	7.5	34.1	12.6	26.7	90.9	7.5	12.6	12.6	76.9
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.5	3.0	3.0	3.0	4.5
All-Red Time (s)	3.4	2.7	3.3	3.6	2.7	3.4	3.3	2.0	3.6	3.4	3.4	2.0
Lost Time Adjust (s)	-1.4	-1.5	-1.3	-1.6	-1.5	-1.4	-1.3	-1.5	-1.6		-1.4	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?				Yes		Yes			Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	45.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	None	C-Min
Walk Time (s)		7.0			7.0			7.0				7.0
Flash Dont Walk (s)		30.0			27.0			29.0				23.0
Pedestrian Calls (#/hr)		0			0			0				0
Act Effct Green (s)	17.4	22.6	56.1	9.4	14.6	34.4	128.0	113.2	127.5		128.0	99.5

UNC DP TIA 2023 — No-Build (2030) PM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	137
Future Volume (vph)	137
Ideal Flow (vphpl)	1900
Storage Length (ft)	100
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1568
Flt Permitted	
Satd. Flow (perm)	1568
Right Turn on Red	Yes
Satd. Flow (RTOR)	98
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Growth Factor	100%
Heavy Vehicles (%)	3%
Adj. Flow (vph)	152
Shared Lane Traffic (%)	
Lane Group Flow (vph)	152
Turn Type	pm+ov
Protected Phases	7
Permitted Phases	6
Detector Phase	7
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	13.4
Total Split (s)	23.0
Total Split (%)	12.8%
Maximum Green (s)	16.6
Yellow Time (s)	3.0
All-Red Time (s)	3.4
Lost Time Adjust (s)	-1.4
Total Lost Time (s)	5.0
Lead/Lag	Lead
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Minimum Gap (s)	2.0
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	None
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	121.9

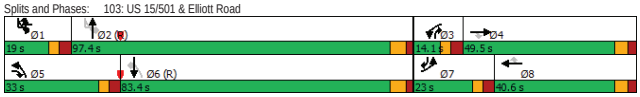
UNC DP TIA 2023 — No-Build (2030) PM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Actuated g/C Ratio	0.10	0.13	0.31	0.05	0.08	0.19	0.71	0.63	0.71		0.71	0.55
v/c Ratio	0.73	0.40	0.49	0.40	0.60	0.39	0.64	0.70	0.17		0.48	0.69
Control Delay	102.8	76.0	39.3	89.3	95.4	14.5	44.4	13.0	1.0		31.5	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0		0.0	0.0
Total Delay	102.8	76.0	39.3	89.3	95.4	14.5	44.4	13.5	1.0		31.5	23.3
LOS	F	E	D	F	F	B	D	B	A		C	C
Approach Delay		63.0			53.7			16.1				21.9
Approach LOS		E			D			B				C
Queue Length 50th (ft)	144	102	189	42	105	22	158	228	4		61	334
Queue Length 95th (ft)	#238	162	255	73	167	88	m221	m499	m8		m139	291
Internal Link Dist (ft)		748			567			712				1296
Turn Bay Length (ft)	525		150	350		150	350		175		225	
Base Capacity (vph)	184	460	546	182	368	423	405	2203	1152		265	1938
Starvation Cap Reductn	0	0	0	0	0	0	0	253	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.67	0.20	0.47	0.39	0.24	0.38	0.61	0.79	0.17		0.46	0.69

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 35 (19%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 26.1 — Intersection LOS: C
Intersection Capacity Utilization 76.6% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 103: US 15/501 & Elliott Road



UNC DP TIA 2023 — No-Build (2030) PM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	SBR
Actuated g/C Ratio	0.68
v/c Ratio	0.14
Control Delay	2.4
Queue Delay	0.0
Total Delay	2.4
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	17
Queue Length 95th (ft)	5
Internal Link Dist (ft)	
Turn Bay Length (ft)	100
Base Capacity (vph)	1105
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.14

Intersection Summary

UNC DP TIA 2023 — No-Build (2030) PM
104: US 15/501 & Eastgate/Ephesus Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	53	127	257	79	26	190	1172	234	63	955	27
Future Volume (vph)	124	53	127	257	79	26	190	1172	234	63	955	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	260		200	220		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	0.99				0.99		1.00		0.98	1.00	1.00	
Frt		0.894			0.963				0.850		0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1649	0	3400	1763	0	1752	3505	1568	1752	3489	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1726	1649	0	3400	1763	0	1751	3505	1536	1751	3489	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57			8				185		2	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		448			1242			1376			811	
Travel Time (s)		12.2			33.9			20.8			12.3	
Confl. Peds. (#/hr)	10					10	1		1	1		1
Confl. Bikes (#/hr)						2						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	138	59	141	286	88	29	211	1302	260	70	1061	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	200	0	286	117	0	211	1302	260	70	1091	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Free	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									Free			
Detector Phase	3	8		7	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	20.0	36.9		33.8	37.7		20.0	80.0		18.0	68.0	
Total Split (s)	30.0	36.9		33.8	40.7		36.0	89.3		20.0	73.3	
Total Split (%)	16.7%	20.5%		18.8%	22.6%		20.0%	49.6%		11.1%	40.7%	
Maximum Green (s)	23.6	30.0		27.0	34.0		29.2	82.5		13.3	66.6	
Yellow Time (s)	3.0	3.0		3.0	3.8		3.0	4.5		3.0	4.5	
All-Red Time (s)	3.4	3.9		3.8	2.9		3.8	2.3		3.7	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.9		6.8	6.7		6.8	6.8		6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.0	2.0		4.0	6.0		2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	60.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	

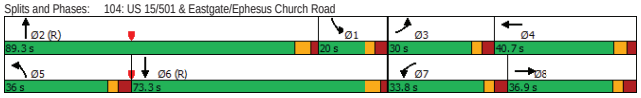
UNC DP TIA 2023 — No-Build (2030) PM
104: US 15/501 & Eastgate/Ephesus Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		23.0			24.0			17.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	18.2	21.4		20.4	24.2		26.7	97.7	180.0	13.3	84.3	
Actuated g/C Ratio	0.10	0.12		0.11	0.13		0.15	0.54	1.00	0.07	0.47	
v/c Ratio	0.78	0.81		0.74	0.48		0.81	0.68	0.17	0.54	0.67	
Control Delay	106.9	78.8		89.1	72.4		113.9	30.2	0.2	84.1	31.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	106.9	78.8		89.1	72.4		113.9	30.2	0.2	84.1	31.9	
LOS	F	E		F	E		F	C	A	F	C	
Approach Delay		90.3			84.3			35.8			35.1	
Approach LOS		F			F			D			D	
Queue Length 50th (ft)	162	170		171	121		263	348	0	81	371	
Queue Length 95th (ft)	238	257		220	184		356	566	0	m139	708	
Internal Link Dist (ft)		368			1162			1296			731	
Turn Bay Length (ft)				200			260		200	220		
Base Capacity (vph)	229	323		510	339		290	1902	1536	129	1634	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.60	0.62		0.56	0.35		0.73	0.68	0.17	0.54	0.67	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 26 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 45.9 — Intersection LOS: D
Intersection Capacity Utilization 78.9% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: US 15/501 & Eastgate/Ephesus Church Road



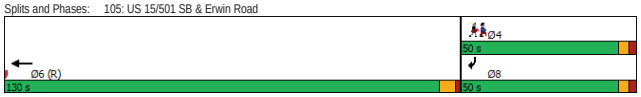
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Lane Configurations							
Traffic Volume (vph)	0	0	1590	474	0	415	
Future Volume (vph)	0	0	1590	474	0	415	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0			0	0	300	
Storage Lanes	0			1	0	1	
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.88	
Ped Bike Factor							
Frt				0.850		0.850	
Flt Protected							
Satd. Flow (prot)	0	0	5036	1568	0	2760	
Flt Permitted							
Satd. Flow (perm)	0	0	5036	1568	0	2760	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				179		60	
Link Speed (mph)		45	45		35		
Link Distance (ft)		777	779		938		
Travel Time (s)		11.8	11.8		18.3		
Confl. Peds. (#/hr)					4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	
Adj. Flow (vph)	0	0	1767	527	0	461	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	1767	527	0	461	
Turn Type			NA	Free		Prot	
Protected Phases			6			8	4
Permitted Phases				Free			
Detector Phase			6			8	
Switch Phase							
Minimum Initial (s)			12.0			7.0	7.0
Minimum Split (s)			117.0			27.4	15.0
Total Split (s)			130.0			50.0	50.0
Total Split (%)			72.2%			27.8%	28%
Maximum Green (s)			123.8			44.6	44.6
Yellow Time (s)			4.5			3.0	3.0
All-Red Time (s)			1.7			2.4	2.4
Lost Time Adjust (s)			0.0			0.0	
Total Lost Time (s)			6.2			5.4	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)			6.0			0.2	1.0
Minimum Gap (s)			2.0			2.0	2.0
Time Before Reduce (s)			15.0			0.0	0.0
Time To Reduce (s)			45.0			0.0	0.0
Recall Mode			C-Max			None	None
Walk Time (s)						7.0	
Flash Dont Walk (s)						15.0	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Pedestrian Calls (#/hr)						0	
Act Effct Green (s)			138.6	180.0		29.8	
Actuated g/C Ratio			0.77	1.00		0.17	
v/c Ratio			0.46	0.34		0.91	
Control Delay			4.1	0.4		86.4	
Queue Delay			0.2	0.0		0.0	
Total Delay			4.3	0.4		86.4	
LOS			A	A		F	
Approach Delay			3.4		86.4		
Approach LOS			A		F		
Queue Length 50th (ft)			140	0		272	
Queue Length 95th (ft)			206	0		332	
Internal Link Dist (ft)		697	699		858		
Turn Bay Length (ft)						300	
Base Capacity (vph)			3878	1568		729	
Starvation Cap Reductn			1085	0		0	
Spillback Cap Reductn			0	0		0	
Storage Cap Reductn			0	0		0	
Reduced v/c Ratio			0.63	0.34		0.63	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 6 (3%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 17.3 Intersection LOS: B
Intersection Capacity Utilization 55.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 105: US 15/501 SB & Erwin Road



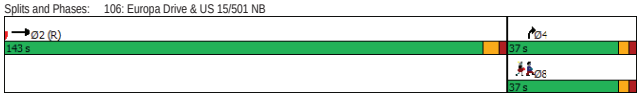
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations							
Traffic Volume (vph)	2352	87	0	0	0	267	
Future Volume (vph)	2352	87	0	0	0	267	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		250	0		0	0	
Storage Lanes		1	0		0	2	
Taper Length (ft)			25		25		
Lane Util. Factor	0.86	1.00	1.00	1.00	1.00	0.88	
Ped Bike Factor							
Frt		0.850				0.850	
Flt Protected							
Satd. Flow (prot)	6408	1583	0	0	0	2787	
Flt Permitted							
Satd. Flow (perm)	6408	1583	0	0	0	2787	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		28				17	
Link Speed (mph)	45			45	25		
Link Distance (ft)	764			605	662		
Travel Time (s)	11.6			9.2	18.1		
Confl. Peds. (#/hr)					4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	2613	97	0	0	0	297	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	2613	97	0	0	0	297	
Turn Type	NA	Free				Prot	
Protected Phases	2					4	8
Permitted Phases		Free					
Detector Phase	2					4	
Switch Phase							
Minimum Initial (s)	12.0					7.0	7.0
Minimum Split (s)	126.0					26.0	28.3
Total Split (s)	143.0					37.0	37.0
Total Split (%)	79.4%					20.6%	21%
Maximum Green (s)	136.2					31.7	31.7
Yellow Time (s)	4.5					3.0	3.0
All-Red Time (s)	2.3					2.3	2.3
Lost Time Adjust (s)	0.0					0.0	
Total Lost Time (s)	6.8					5.3	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	6.0					1.0	0.2
Minimum Gap (s)	2.0					2.0	2.0
Time Before Reduce (s)	15.0					0.0	0.0
Time To Reduce (s)	45.0					0.0	0.0
Recall Mode	C-Max					None	None
Walk Time (s)							7.0
Flash Dont Walk (s)							16.0
Pedestrian Calls (#/hr)							2
Act Effct Green (s)	146.2	180.0				21.7	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Actuated g/C Ratio	0.81	1.00				0.12	
v/c Ratio	0.50	0.06				0.85	
Control Delay	1.8	0.0				94.5	
Queue Delay	0.2	0.0				0.0	
Total Delay	2.0	0.0				94.5	
LOS	A	A				F	
Approach Delay	2.0				94.5		
Approach LOS	A				F		
Queue Length 50th (ft)	38	0				188	
Queue Length 95th (ft)	86	m0				243	
Internal Link Dist (ft)	684			525	582		
Turn Bay Length (ft)		250					
Base Capacity (vph)	5206	1583				504	
Starvation Cap Reductn	1369	0				0	
Spillback Cap Reductn	0	0				0	
Storage Cap Reductn	0	0				0	
Reduced v/c Ratio	0.68	0.06				0.59	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 157 (87%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 11.1 Intersection LOS: B
Intersection Capacity Utilization 53.9% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Europa Drive & US 15/501 NB



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1659	361	0
Future Volume (vph)	0	0	0	1659	361	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Right Turn on Red		Yes			Yes	Yes
Satd. Flow (RTOR)					64	
Link Speed (mph)	45			45	35	
Link Distance (ft)	779			295	205	
Travel Time (s)	11.8			4.5	4.0	
Confl. Bikes (#/hr)		3				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1843	401	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1843	401	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				12.0	7.0	
Minimum Split (s)				18.7	13.5	
Total Split (s)				69.0	21.0	
Total Split (%)				76.7%	23.3%	
Maximum Green (s)				62.3	14.5	
Yellow Time (s)				4.7	4.0	
All-Red Time (s)				2.0	2.5	
Lost Time Adjust (s)				-1.7	-1.5	
Total Lost Time (s)				5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				6.0	5.0	
Minimum Gap (s)				3.0	0.2	
Time Before Reduce (s)				15.0	0.0	
Time To Reduce (s)				45.0	0.0	
Recall Mode				C-Min	None	
Act Effct Green (s)				64.3	15.7	
Actuated g/C Ratio				0.71	0.17	
v/c Ratio				0.73	0.62	
Control Delay				8.2	34.8	
Queue Delay				0.0	0.0	
Total Delay				8.2	34.8	
LOS				A	C	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach Delay				8.2	34.8	
Approach LOS				A	C	
Queue Length 50th (ft)				377	110	
Queue Length 95th (ft)				395	129	
Internal Link Dist (ft)	699			215	125	
Turn Bay Length (ft)						
Base Capacity (vph)				2538	673	
Starvation Cap Reductn				0	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.73	0.60	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 67 (74%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 12.9 — Intersection LOS: B
Intersection Capacity Utilization 112.4% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 107: NB/EB U-Turn & US 15/501 SB



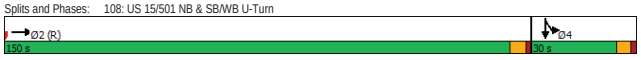
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2349	0	0	0	0	0	0	0	62	102	0
Future Volume (vph)	0	2349	0	0	0	0	0	0	0	62	102	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected										0.950		
Satd. Flow (prot)	0	3539	0	0	0	0	0	0	0	3433	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	3539	0	0	0	0	0	0	0	3433	1863	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										25		
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1186			764			262			186	
Travel Time (s)		18.0			11.6			6.0			3.6	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.92	0.92	0.90	0.90	0.92	0.92	0.92	0.90	0.92	0.90
Adj. Flow (vph)	0	2610	0	0	0	0	0	0	0	69	111	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2610	0	0	0	0	0	0	0	69	111	0
Turn Type		NA								Split	NA	
Protected Phases		2								4	4	
Permitted Phases												
Detector Phase		2								4	4	
Switch Phase												
Minimum Initial (s)		12.0								7.0	7.0	
Minimum Split (s)		150.0								30.0	30.0	
Total Split (s)		150.0								30.0	30.0	
Total Split (%)		83.3%								16.7%	16.7%	
Maximum Green (s)		143.8								24.0	24.0	
Yellow Time (s)		4.7								4.0	4.0	
All-Red Time (s)		1.5								2.0	2.0	
Lost Time Adjust (s)		-1.2								-1.0	0.0	
Total Lost Time (s)		5.0								5.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0								1.0	1.0	
Minimum Gap (s)		2.0								2.0	2.0	
Time Before Reduce (s)		15.0								0.0	0.0	
Time To Reduce (s)		45.0								0.0	0.0	
Recall Mode		C-Max								None	None	
Act Effct Green (s)		154.8								15.2	14.2	
Actuated g/C Ratio		0.86								0.08	0.08	
v/c Ratio		0.86								0.22	0.76	
Control Delay		11.8								48.9	109.6	
Queue Delay		0.0								0.0	0.0	
Total Delay		11.8								48.9	109.6	
LOS		B								D	F	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		11.8									86.3	
Approach LOS		B									F	
Queue Length 50th (ft)		670								25	132	
Queue Length 95th (ft)		510								m51	199	
Internal Link Dist (ft)		1106			684			182			106	
Turn Bay Length (ft)												
Base Capacity (vph)		3044								498	248	
Starvation Cap Reductn		0								0	0	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.86								0.14	0.45	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 142 (79%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 16.6 — Intersection LOS: B
Intersection Capacity Utilization 79.9% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 108: US 15/501 NB & SB/WB U-Turn



UNC DP TIA 2023 — No-Build (2030) PM
109: Old Durham-CH Road/Sage Road & US 15/501 — Lanes, Volumes, Timings

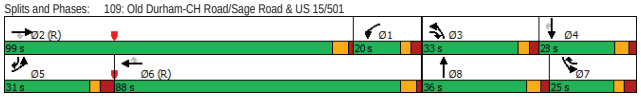
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	388	1567	250	89	1321	257	213	189	30	198	180	122
Future Volume (vph)	388	1567	250	89	1321	257	213	189	30	198	180	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	240		100	220		200	100		0	150		100
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.98				0.99	1.00				0.98
Frt			0.850			0.850		0.980				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3505	1568	1752	3505	1568	1752	1804	0	3400	1845	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	3505	1536	1752	3505	1568	1742	1804	0	3400	1845	1541
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			91			113		4				90
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		829			1831			1573			1089	
Travel Time (s)		12.6			27.7			30.6			21.2	
Confl. Peds. (#/hr)							4					4
Confl. Bikes (#/hr)			1						1			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	431	1741	278	99	1468	286	237	210	33	220	200	136
Shared Lane Traffic (%)												
Lane Group Flow (vph)	431	1741	278	99	1468	286	237	243	0	220	200	136
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	25.0	89.0	25.0	20.0	65.0	25.0	25.0	25.0		25.0	25.0	25.0
Total Split (s)	31.0	99.0	33.0	20.0	88.0	25.0	33.0	36.0		25.0	28.0	31.0
Total Split (%)	17.2%	55.0%	18.3%	11.1%	48.9%	13.9%	18.3%	20.0%		13.9%	15.6%	17.2%
Maximum Green (s)	24.1	93.3	27.1	13.7	81.9	18.3	27.1	29.4		18.3	21.6	24.1
Yellow Time (s)	3.0	4.4	3.0	3.0	4.5	3.0	3.0	4.1		3.0	4.1	3.0
All-Red Time (s)	3.9	1.3	2.9	3.3	1.6	3.7	2.9	2.5		3.7	2.3	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.9	5.7	5.9	6.3	6.1	6.7	5.9	6.6		6.7	6.4	6.9
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	4.0	1.0	6.0	1.0	4.0	4.0		1.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	15.0	0.0	0.0	15.0	0.0	0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	45.0	0.0	0.0	45.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	23.8	94.8	121.0	13.7	83.7	101.9	26.5	27.5		18.8	20.8	44.0

UNC DP TIA 2023 — No-Build (2030) PM
109: Old Durham-CH Road/Sage Road & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.13	0.53	0.67	0.08	0.46	0.57	0.15	0.15		0.10	0.12	0.24
v/c Ratio	0.96	0.94	0.26	0.74	0.90	0.31	0.92	0.87		0.62	0.94	0.30
Control Delay	102.1	49.3	4.7	101.9	47.2	8.2	113.6	101.8		85.6	125.1	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	102.1	49.3	4.7	101.9	47.2	8.2	113.6	101.8		85.6	125.1	19.6
LOS	F	D	A	F	D	A	F	F		F	F	B
Approach Delay		53.5			44.1			107.7			83.6	
Approach LOS		D			D			F			F	
Queue Length 50th (ft)	261	928	55	111	503	82	280	277		130	237	40
Queue Length 95th (ft)	#377	#1033	71	m#185	795	193	#448	#419		180	#399	102
Internal Link Dist (ft)		749			1751			1493			1009	
Turn Bay Length (ft)	240		100	220		200	100			150		100
Base Capacity (vph)	455	1844	1072	133	1629	936	263	298		354	221	450
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.95	0.94	0.26	0.74	0.90	0.31	0.90	0.82		0.62	0.90	0.30

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 140 (78%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 160
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 58.3 — Intersection LOS: E
Intersection Capacity Utilization 90.7% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 109: Old Durham-CH Road/Sage Road & US 15/501



UNC DP TIA 2023 — No-Build (2030) PM
110: BCBS/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

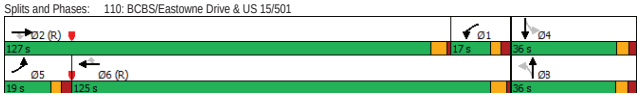
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	1784	16	96	1575	51	6	29	88	130	28	100
Future Volume (vph)	33	1784	16	96	1575	51	6	29	88	130	28	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220		100	220		250	100		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98			0.98						
Frt			0.850			0.850		0.887			0.883	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1636	0	1752	1629	0
Flt Permitted	0.950			0.950			0.496			0.535		
Satd. Flow (perm)	1752	3505	1536	1752	3505	1536	915	1636	0	987	1629	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			54		73			86	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		1831			1555			278			606	
Travel Time (s)		27.7			23.6			7.6			16.5	
Confl. Bikes (#/hr)			1			1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	37	1982	18	107	1750	57	7	32	98	144	31	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	1982	18	107	1750	57	7	130	0	144	142	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	19.0	127.0	127.0	17.0	108.0	108.0	36.0	36.0		36.0	36.0	
Total Split (s)	19.0	127.0	127.0	17.0	125.0	125.0	36.0	36.0		36.0	36.0	
Total Split (%)	10.6%	70.6%	70.6%	9.4%	69.4%	69.4%	20.0%	20.0%		20.0%	20.0%	
Maximum Green (s)	13.2	121.3	121.3	11.2	119.1	119.1	29.9	29.9		30.1	30.1	
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.3	3.3		3.6	3.6	
All-Red Time (s)	2.8	1.1	1.1	2.8	1.3	1.3	2.8	2.8		2.3	2.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.8	5.7	5.7	5.8	5.9	5.9	6.1	6.1		5.9	5.9	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	6.0	1.0	6.0	6.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	50.0	50.0	0.0	50.0	50.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										23.0	23.0	

UNC DP TIA 2023 — No-Build (2030) PM
110: BCBS/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)										2	2	
Act Effct Green (s)	8.1	123.4	123.4	11.2	128.8	128.8	27.8	27.8		28.0	28.0	
Actuated g/C Ratio	0.04	0.69	0.69	0.06	0.72	0.72	0.15	0.15		0.16	0.16	
v/c Ratio	0.47	0.83	0.02	0.98	0.70	0.05	0.05	0.41		0.94	0.44	
Control Delay	116.9	4.0	0.0	121.6	1.1	0.1	64.3	34.0		130.7	31.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	116.9	4.0	0.0	121.6	1.1	0.1	64.3	34.0		130.7	31.5	
LOS	F	A	A	F	A	A	E	C		F	C	
Approach Delay		6.1			7.8			35.5			81.4	
Approach LOS		A			A			D			F	
Queue Length 50th (ft)	45	171	0	129	6	0	7	59		169	58	
Queue Length 95th (ft)	m51	180	m0	m#193	7	m0	24	133		#309	134	
Internal Link Dist (ft)		1751			1475			198			526	
Turn Bay Length (ft)	220		100	220		250	100					
Base Capacity (vph)	128	2401	1070	109	2507	1114	151	332		165	344	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.29	0.83	0.02	0.98	0.70	0.05	0.05	0.39		0.87	0.41	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 140 (78%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 12.7 — Intersection LOS: B
Intersection Capacity Utilization 83.5% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 110: BCBS/Eastowne Drive & US 15/501



UNC DP TIA 2023 — No-Build (2030) PM
111: Lakeview Drive/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

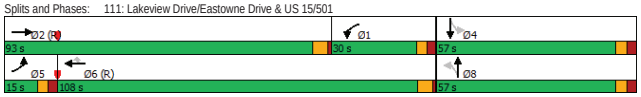
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1997	10	86	1685	123	12	25	105	242	17	11
Future Volume (vph)	1	1997	10	86	1685	123	12	25	105	242	17	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		125	0		0	150		0	200		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00							1.00	
Frt		0.999				0.850		0.879			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	5030	0	1752	3505	1568	1752	1621	0	1752	1729	0
Flt Permitted	0.950			0.950			0.737			0.586		
Satd. Flow (perm)	1752	5030	0	1752	3505	1568	1360	1621	0	1081	1729	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				71		116			12	
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		1555			959			495			676	
Travel Time (s)		23.6			14.5			9.6			18.4	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	1	2219	11	96	1872	137	13	28	117	269	19	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	2230	0	96	1872	137	13	145	0	269	31	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	92.0		30.0	80.0	80.0	30.0	30.0		30.0	30.0	
Total Split (s)	15.0	93.0		30.0	108.0	108.0	57.0	57.0		57.0	57.0	
Total Split (%)	8.3%	51.7%		16.7%	60.0%	60.0%	31.7%	31.7%		31.7%	31.7%	
Maximum Green (s)	9.4	87.5		24.2	102.5	102.5	50.8	50.8		50.9	50.9	
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	3.2	3.2		3.1	3.1	
All-Red Time (s)	2.6	1.0		2.8	1.0	1.0	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.5		5.8	5.5	5.5	6.2	6.2		6.1	6.1	
Lead/Lag	Lead	Lead		Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0		1.0	6.0	6.0	1.0	1.0		2.0	2.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	45.0		0.0	45.0	45.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	7.0	91.8		24.2	119.3	119.3	46.5	46.5		46.6	46.6	

UNC DP TIA 2023 — No-Build (2030) PM
111: Lakeview Drive/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.04	0.51		0.13	0.66	0.66	0.26	0.26		0.26	0.26	
v/c Ratio	0.01	0.87		0.41	0.81	0.13	0.04	0.29		0.96	0.07	
Control Delay	102.0	37.9		77.2	27.0	6.8	47.8	13.9		109.6	33.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	102.0	37.9		77.2	27.0	6.8	47.8	13.9		109.6	33.2	
LOS	F	D		E	C	A	D	B		F	C	
Approach Delay		37.9			28.0			16.7			101.7	
Approach LOS		D			C			B			F	
Queue Length 50th (ft)	1	617		106	826	27	11	25		307	16	
Queue Length 95th (ft)	m1	811		172	1137	68	32	88		#485	47	
Internal Link Dist (ft)		1475			879			415			596	
Turn Bay Length (ft)	150						150			200		
Base Capacity (vph)	91	2565		235	2322	1062	383	540		305	497	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.01	0.87		0.41	0.81	0.13	0.03	0.27		0.88	0.06	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 133 (74%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 36.9 — Intersection LOS: D
Intersection Capacity Utilization 93.1% — ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 111: Lakeview Drive/Eastowne Drive & US 15/501



No-Build (2030) PM.syn VHB

UNC DP TIA 2023 — No-Build (2030) PM
201: Hamilton Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	2266	52	63	1824	42	148	14	88	121	14	30
Future Volume (vph)	27	2266	52	63	1824	42	148	14	88	121	14	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-4%			2%			-2%	
Storage Length (ft)	200		0	200		0	0		150	100		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.99		0.97	0.98	0.99	
Frt		0.997			0.997				0.850		0.899	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	5016	0	1805	5168	0	1752	1844	1567	1787	1669	0
Flt Permitted	0.061			0.053			0.725			0.747		
Satd. Flow (perm)	112	5016	0	101	5168	0	1327	1844	1518	1378	1669	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		4			4							
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		895			935			499			486	
Travel Time (s)		13.6			14.2			9.7			9.5	
Confl. Peds. (#/hr)	4		2	2		4	7		19	19		7
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	30	2518	58	70	2027	47	164	16	98	134	16	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	2576	0	70	2074	0	164	16	98	134	49	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	6			2			8		8	4		
Detector Phase	5	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	12.6	28.7		12.4	25.9		41.0	41.0	12.4	39.6	39.6	
Total Split (s)	12.7	66.2		12.8	66.3		41.0	41.0	12.8	41.0	41.0	
Total Split (%)	10.6%	55.2%		10.7%	55.3%		34.2%	34.2%	10.7%	34.2%	34.2%	
Maximum Green (s)	7.1	60.5		7.4	60.6		34.7	34.7	7.4	34.4	34.4	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.7	3.7	3.0	3.2	3.2	
All-Red Time (s)	2.6	1.7		2.4	1.7		2.6	2.6	2.4	3.4	3.4	
Lost Time Adjust (s)	-0.6	-0.6		-0.4	-0.9		-1.4	-1.4	-0.4	-1.5	-1.5	
Total Lost Time (s)	5.0	5.1		5.0	4.8		4.9	4.9	5.0	5.1	5.1	
Lead/Lag	Lead	Lead		Lag	Lag				Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		2.0	3.0		1.0	1.0	2.0	1.0	1.0	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		16.0			13.0		27.0	27.0		26.0	26.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	87.2	77.4		85.2	82.9		19.9	19.9	27.5	19.7	19.7	
Actuated g/C Ratio	0.73	0.64		0.71	0.69		0.17	0.17	0.23	0.16	0.16	

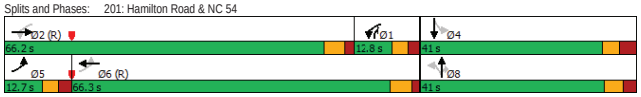
No-Build (2030) PM.syn VHB

UNC DP TIA 2023 — No-Build (2030) PM
201: Hamilton Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.16	0.80		0.39	0.58		0.75	0.05	0.28	0.59	0.18	
Control Delay	7.1	19.0		21.8	9.4		67.1	38.9	34.7	56.1	42.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	7.1	19.0		21.8	9.4		67.1	38.9	34.7	56.1	42.0	
LOS	A	B		C	A		E	D	C	E	D	
Approach Delay		18.9			9.8			54.1			52.3	
Approach LOS		B			A			D			D	
Queue Length 50th (ft)	5	494		13	323		122	11	59	97	33	
Queue Length 95th (ft)	16	683		42	332		185	29	96	152	64	
Internal Link Dist (ft)		815			855			419			406	
Turn Bay Length (ft)	200			200					150	100		
Base Capacity (vph)	186	3236		182	3569		399	554	352	412	499	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.16	0.80		0.38	0.58		0.41	0.03	0.28	0.33	0.10	

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 71 (59%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 18.2 — Intersection LOS: B
Intersection Capacity Utilization 81.6% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 201: Hamilton Road & NC 54



No-Build (2030) PM.syn VHB

UNC DP TIA 2023 — No-Build (2030) PM
202: Finley Golf Course Road/Burning Tree Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	2660	23	208	1763	27	39	11	142	34	14	35
Future Volume (vph)	59	2660	23	208	1763	27	39	11	142	34	14	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	12	12	12	10	10	10
Storage Length (ft)	200		0	100		0	460		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00			0.99	
Frt		0.999			0.998				0.850		0.943	
Flt Protected	0.950			0.950				0.962			0.980	
Satd. Flow (prot)	1770	5079	0	1770	4904	0	0	1792	1583	0	1594	0
Flt Permitted	0.076			0.048				0.656			0.842	
Satd. Flow (perm)	142	5079	0	89	4904	0	0	1216	1583	0	1370	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			2				83		33	
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		651			853			632			471	
Travel Time (s)		9.9			12.9			12.3			9.2	
Confl. Peds. (#/hr)	2		7	7		2	7					7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	66	2956	26	231	1959	30	43	12	158	38	16	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	2982	0	231	1989	0	0	55	158	0	93	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	6			2			8		8	4		
Detector Phase	5	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	12.9	31.2		12.9	29.2		47.2	47.2	12.9	45.3	45.3	
Total Split (s)	13.0	58.8		14.0	59.8		47.2	47.2	14.0	47.2	47.2	
Total Split (%)	10.8%	49.0%		11.7%	49.8%		39.3%	39.3%	11.7%	39.3%	39.3%	
Maximum Green (s)	7.1	52.6		8.1	53.6		41.0	41.0	8.1	40.9	40.9	
Yellow Time (s)	3.0	4.9		3.0	4.9		3.7	3.7	3.0	3.2	3.2	
All-Red Time (s)	2.9	1.3		2.9	1.3		2.5	2.5	2.9	3.1	3.1	
Lost Time Adjust (s)	-0.9	-1.2		-0.9	-1.2			-1.2	-0.9		-1.3	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lead		Lag	Lag				Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0	2.0	2.0	2.0	
Minimum Gap (s)	0.2	3.0		0.2	3.0		0.2	0.2	0.2	0.2	0.2	
Time Before Reduce (s)	0.0	20.0		0.0	20.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	40.0		0.0	40.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		7.0			7.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		18.0			16.0		34.0	34.0		32.0	32.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	

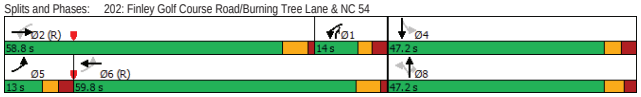
UNC DP TIA 2023 — No-Build (2030) PM
202: Finley Golf Course Road/Burning Tree Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	94.4	84.4		93.4	87.8			11.6	25.6		11.6	
Actuated g/C Ratio	0.79	0.70		0.78	0.73			0.10	0.21		0.10	
v/c Ratio	0.30	0.83		1.18	0.55			0.47	0.39		0.58	
Control Delay	10.6	4.5		145.6	2.1			63.4	21.7		47.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	10.6	4.5		145.6	2.1			63.4	21.7		47.6	
LOS	B	A		F	A			E	C		D	
Approach Delay		4.6			17.1			32.5			47.6	
Approach LOS		A			B			C			D	
Queue Length 50th (ft)	5	105		~164	22			41	49		45	
Queue Length 95th (ft)	m11	119		m#328	173			82	106		97	
Internal Link Dist (ft)		571			773			552			391	
Turn Bay Length (ft)	200			100								
Base Capacity (vph)	223	3574		195	3590			427	402		503	
Starvation Cap Reductn	0	4		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.30	0.84		1.18	0.55			0.13	0.39		0.18	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 102 (85%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 11.4 — Intersection LOS: B
Intersection Capacity Utilization 91.6% — ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 202: Finley Golf Course Road/Burning Tree Lane & NC 54



No-Build (2030) PM.syn VHB

UNC DP TIA 2023 — No-Build (2030) PM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	2328	16	8	2129	14	43	11	43	29	1	138
Future Volume (vph)	177	2328	16	8	2129	14	43	11	43	29	1	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	250		250	0		125	0		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.91			0.95						
Frt			0.850			0.850		0.880			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1639	0	1770	1585	0
Flt Permitted	0.050			0.043			0.430			0.718		
Satd. Flow (perm)	93	5085	1436	80	5085	1508	801	1639	0	1337	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			96			190		48			153	
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		853			1936			433			831	
Travel Time (s)		12.9			29.3			11.8			16.2	
Confl. Peds. (#/hr)	25		26	26		25						
Confl. Bikes (#/hr)						3						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	197	2587	18	9	2366	16	48	12	48	32	1	153
Shared Lane Traffic (%)												
Lane Group Flow (vph)	197	2587	18	9	2366	16	48	60	0	32	154	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6		2	2		6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.3	27.3	27.3	13.3	18.3	18.3	13.8	13.8		14.3	14.3	
Total Split (s)	15.3	92.4	92.4	13.3	63.4	63.4	14.3	14.3		14.3	14.3	
Total Split (%)	12.8%	77.0%	77.0%	11.1%	52.8%	52.8%	11.9%	11.9%		11.9%	11.9%	
Maximum Green (s)	9.0	86.1	86.1	7.0	57.1	57.1	7.5	7.5		7.0	7.0	
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.0	3.0		3.5	3.5	
All-Red Time (s)	3.3	1.6	1.6	3.3	1.6	1.6	3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.8	-1.8		-2.3	-2.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag					Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	6.0	1.0	6.0	6.0	2.0	2.0		2.0	2.0	
Minimum Gap (s)	0.2	3.0	3.0	0.2	3.0	3.0	0.2	0.2		0.2	0.2	
Time Before Reduce (s)	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	40.0	40.0	0.0	40.0	40.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		14.0	14.0									
Pedestrian Calls (#/hr)		0	0									

No-Build (2030) PM.syn VHB

UNC DP TIA 2023 — No-Build (2030) PM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	27.0
Total Split (s)	27.0
Total Split (%)	23%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0

No-Build (2030) PM.syn VHB

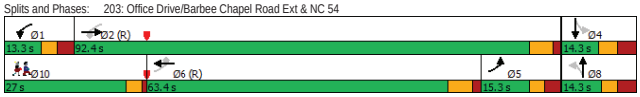
UNC DP TIA 2023 — No-Build (2030) PM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	95.7	98.0	98.0	99.7	84.8	84.8	9.3	9.3		9.3	9.3	
Actuated g/C Ratio	0.80	0.82	0.82	0.83	0.71	0.71	0.08	0.08		0.08	0.08	
v/c Ratio	0.87	0.62	0.02	0.05	0.66	0.01	0.77	0.35		0.31	0.59	
Control Delay	53.7	0.9	0.0	1.8	13.2	0.0	117.5	25.3		60.8	18.0	
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	53.7	1.0	0.0	1.8	13.2	0.0	117.5	25.3		60.8	18.0	
LOS	D	A	A	A	B	A	F	C		E	B	
Approach Delay		4.7			13.1			66.2			25.4	
Approach LOS		A			B			E			C	
Queue Length 50th (ft)	105	20	0	2	397	0	37	9		24	1	
Queue Length 95th (ft)	m#164	39	m0	m1	388	m0	#110	52		58	66	
Internal Link Dist (ft)		773			1856			353			751	
Turn Bay Length (ft)	250		250	250		250						
Base Capacity (vph)	226	4154	1190	183	3594	1121	62	171		103	263	
Starvation Cap Reductn	0	378	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.87	0.69	0.02	0.05	0.66	0.01	0.77	0.35		0.31	0.59	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 86 (72%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 10.3 — Intersection LOS: B
Intersection Capacity Utilization 82.0% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 203: Office Drive/Barbee Chapel Road Ext & NC 54



UNC DP TIA 2023 — No-Build (2030) PM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	Ø10
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — No-Build (2030) PM
204: Friday Center Lane/Meadowmont Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	2311	42	35	1695	107	97	17	340	119	26	154
Future Volume (vph)	111	2311	42	35	1695	107	97	17	340	119	26	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	12	12	12	12	12	12	12	12	12
Storage Length (ft)	250		250	250		250	0		400	225		0
Storage Lanes	2		1	2		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	1.00	0.97	1.00	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	0.98	0.99	0.99	1.00		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.966		0.950		
Satd. Flow (prot)	3433	5085	1478	3433	5085	1583	1681	1709	1583	3433	1863	1583
Flt Permitted	0.950			0.950			0.950	0.966		0.950		
Satd. Flow (perm)	3431	5085	1447	3432	5085	1557	1649	1687	1561	3421	1863	1552
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			105			119			99			97
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1936			1043			1237			723	
Travel Time (s)		29.3			15.8			24.1			14.1	
Confl. Peds. (#/hr)	4		7	7		4	5		1	1		5
Confl. Bikes (#/hr)									1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	123	2568	47	39	1883	119	108	19	378	132	29	171
Shared Lane Traffic (%)							42%					
Lane Group Flow (vph)	123	2568	47	39	1883	119	63	64	378	132	29	171
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2	4	1	6	3	4	4	1	3	3	5
Permitted Phases			2			6			4			3
Detector Phase	5	2	4	1	6	3	4	4	1	3	3	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.2	34.6	14.1	14.1	38.5	14.3	14.1	14.1	14.1	14.3	14.3	14.2
Total Split (s)	18.4	69.6	14.1	22.0	73.2	14.3	14.1	14.1	22.0	14.3	14.3	18.4
Total Split (%)	15.3%	58.0%	11.8%	18.3%	61.0%	11.9%	11.8%	11.8%	18.3%	11.9%	11.9%	15.3%
Maximum Green (s)	11.2	63.0	7.0	14.9	66.7	7.0	7.0	7.0	14.9	7.0	7.0	11.2
Yellow Time (s)	3.2	4.6	3.7	3.1	4.4	4.0	3.7	3.7	3.1	4.0	4.0	3.2
All-Red Time (s)	4.0	2.0	3.4	4.0	2.1	3.3	3.4	3.4	4.0	3.3	3.3	4.0
Lost Time Adjust (s)	-2.2	-1.6	-2.1	-2.1	-1.5	-2.3	-2.1	-2.1	-2.1	-2.3	-2.3	-2.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Time Before Reduce (s)	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	C-Min	None	None	C-Min	Min	None	None	None	Min	Min	Min
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		21.0			25.0							

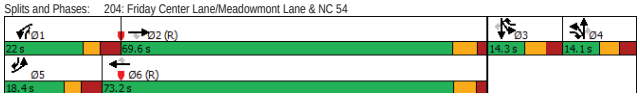
UNC DP TIA 2023 — No-Build (2030) PM
204: Friday Center Lane/Meadowmont Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	10.4	66.9	76.0	17.6	74.0	83.3	9.1	9.1	24.8	9.3	9.3	19.7
Actuated g/C Ratio	0.09	0.56	0.63	0.15	0.62	0.69	0.08	0.08	0.21	0.08	0.08	0.16
v/c Ratio	0.41	0.91	0.05	0.08	0.60	0.11	0.50	0.50	0.93	0.50	0.20	0.51
Control Delay	58.9	20.5	0.3	39.7	16.7	2.5	67.2	67.0	64.4	59.9	55.5	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.9	20.5	0.3	39.7	16.7	2.5	67.2	67.0	64.4	59.9	55.5	19.6
LOS	E	C	A	D	B	A	E	E	E	E	E	B
Approach Delay		21.8			16.3			65.1			38.8	
Approach LOS		C			B			E			D	
Queue Length 50th (ft)	52	429	0	15	170	0	50	50	206	51	21	41
Queue Length 95th (ft)	m82	593	m0	m21	410	m22	101	101	#405	84	53	94
Internal Link Dist (ft)		1856			963			1157			643	
Turn Bay Length (ft)	250		250	250		250			400	225		
Base Capacity (vph)	383	2833	956	502	3137	1119	127	129	405	266	144	375
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.91	0.05	0.08	0.60	0.11	0.50	0.50	0.93	0.50	0.20	0.46

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 95 (79%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 24.7 — Intersection LOS: C
Intersection Capacity Utilization 84.1% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 204: Friday Center Lane/Meadowmont Lane & NC 54



UNC DP TIA 2023 — No-Build (2030) PM
205: Barbee Chapel Road & NC 54 — Lanes, Volumes, Timings

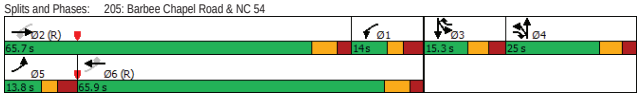
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	2168	770	149	1837	188	296	80	57	105	90	25
Future Volume (vph)	12	2168	770	149	1837	188	296	80	57	105	90	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		275	325		80	250		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Ped Bike Factor			0.97			0.98	1.00	1.00			1.00	
Frt			0.850			0.850		0.960			0.970	
Flt Protected	0.950			0.950			0.950	0.982		0.950	0.996	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1681	1668	0	1681	1704	0
Flt Permitted	0.062			0.071			0.950	0.982		0.950	0.996	
Satd. Flow (perm)	115	5085	1529	132	5085	1547	1679	1667	0	1681	1704	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			197			100		13			8	
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		1043			982			1263			745	
Travel Time (s)		15.8			14.9			19.1			14.5	
Confl. Peds. (#/hr)	1		4	4		1	1					1
Confl. Bikes (#/hr)			3									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	2409	856	166	2041	209	329	89	63	117	100	28
Shared Lane Traffic (%)							26%			10%		
Lane Group Flow (vph)	13	2409	856	166	2041	209	243	238	0	105	140	0
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	Split	NA		Split	NA	
Protected Phases	5	2	4	1	6	3	4	4		3	3	
Permitted Phases	6		2	2		6						
Detector Phase	5	2	4	1	6	3	4	4		3	3	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.8	26.5	14.2	14.0	28.5	14.2	14.2	14.2		14.2	14.2	
Total Split (s)	13.8	65.7	25.0	14.0	65.9	15.3	25.0	25.0		15.3	15.3	
Total Split (%)	11.5%	54.8%	20.8%	11.7%	54.9%	12.8%	20.8%	20.8%		12.8%	12.8%	
Maximum Green (s)	7.0	58.2	17.8	7.0	58.4	8.1	17.8	17.8		8.1	8.1	
Yellow Time (s)	3.0	4.8	4.3	3.0	4.8	3.9	4.3	4.3		3.9	3.9	
All-Red Time (s)	3.8	2.7	2.9	4.0	2.7	3.3	2.9	2.9		3.3	3.3	
Lost Time Adjust (s)	-1.8	-2.5	-2.2	-2.0	-2.5	-2.2	-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0	3.0	2.0	6.0	2.0	3.0	3.0		2.0	2.0	
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2		0.2	0.2	
Time Before Reduce (s)	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min	None	None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		12.0			14.0							
Pedestrian Calls (#/hr)		0			0							

UNC DP TIA 2023 — No-Build (2030) PM
205: Barbee Chapel Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	72.7	60.7	80.7	69.7	69.2	79.5	20.0	20.0		10.3	10.3	
Actuated g/C Ratio	0.61	0.51	0.67	0.58	0.58	0.66	0.17	0.17		0.09	0.09	
v/c Ratio	0.07	0.94	0.78	0.83	0.70	0.20	0.87	0.83		0.73	0.92	
Control Delay	3.8	18.8	6.1	71.3	20.7	4.4	77.9	69.3		81.7	104.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	3.8	18.8	6.1	71.3	20.7	4.4	77.9	69.3		81.7	104.9	
LOS	A	B	A	E	C	A	E	E		F	F	
Approach Delay		15.5			22.7			73.7			94.9	
Approach LOS		B			C			E			F	
Queue Length 50th (ft)	1	341	34	72	341	20	194	180		85	108	
Queue Length 95th (ft)	m2	508	m83	#194	524	62	#347	#322		#177	#242	
Internal Link Dist (ft)		963			902			1183			665	
Turn Bay Length (ft)	275		275	325		80	250					
Base Capacity (vph)	190	2572	1101	199	2931	1061	280	288		144	153	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.07	0.94	0.78	0.83	0.70	0.20	0.87	0.83		0.73	0.92	

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 3 (3%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 25.6 — Intersection LOS: C
Intersection Capacity Utilization 84.9% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 205: Barbee Chapel Road & NC 54



UNC DP TIA 2023 — No-Build (2030) PM
208: Environ Way/Rogerson Dr & NC 54 — Lanes, Volumes, Timings

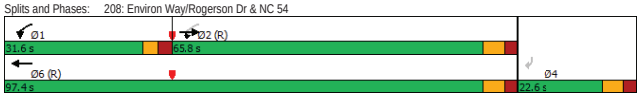
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2508	55	72	1957	0	0	0	87	0	0	2
Future Volume (vph)	0	2508	55	72	1957	0	0	0	87	0	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-4%			0%			0%	
Storage Length (ft)	0		100	250		0	0		0	0		0
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.98
Frt			0.850						0.865			0.865
Flt Protected				0.950								
Satd. Flow (prot)	0	5085	1583	1805	5187	0	0	0	1611	0	0	1611
Flt Permitted				0.042								
Satd. Flow (perm)	0	5085	1583	80	5187	0	0	0	1611	0	0	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			84						453			84
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		935			651			374			582	
Travel Time (s)		14.2			9.9			8.5			13.2	
Confl. Peds. (#/hr)	1		14	14		1	2		2	2		2
Confl. Bikes (#/hr)						2						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2787	61	80	2174	0	0	0	97	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2787	61	80	2174	0	0	0	97	0	0	2
Turn Type		NA	Prot	D.P+P	NA				custom			Perm
Protected Phases		2	2	1	6							
Permitted Phases				2								4
Detector Phase		2	2	1	6							4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0							7.0
Minimum Split (s)		30.6	30.6	31.6	16.6							22.6
Total Split (s)		65.8	65.8	31.6	97.4							22.6
Total Split (%)		54.8%	54.8%	26.3%	81.2%							18.8%
Maximum Green (s)		59.2	59.2	26.0	90.8							16.0
Yellow Time (s)		4.0	4.0	3.0	4.0							4.0
All-Red Time (s)		2.6	2.6	2.6	2.6							2.6
Lost Time Adjust (s)		-1.6	-1.6	-0.6	-1.6							-1.6
Total Lost Time (s)		5.0	5.0	5.0	5.0							5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		2.0	2.0	2.0	2.0							2.0
Recall Mode		C-Max	C-Max	None	C-Min							None
Walk Time (s)		7.0	7.0	7.0								7.0
Flash Dont Walk (s)		17.0	17.0	19.0								9.0
Pedestrian Calls (#/hr)		0	0	0								0
Act Effct Green (s)		102.7	102.7	108.3	116.3				0.0			8.6
Actuated g/C Ratio		0.86	0.86	0.90	0.97				0.00			0.07

UNC DP TIA 2023 — No-Build (2030) PM
208: Environ Way/Rogerson Dr & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.64	0.04	0.42	0.43				0.21			0.01
Control Delay		1.2	0.0	22.7	0.9				1.1			0.0
Queue Delay		0.0	0.0	0.0	0.0				0.0			0.0
Total Delay		1.2	0.0	22.7	0.9				1.1			0.0
LOS		A	A	C	A				A			A
Approach Delay		1.1			1.7			1.1				
Approach LOS		A			A			A				
Queue Length 50th (ft)		31	0	16	0				0			0
Queue Length 95th (ft)		80	m0	m61	157				0			0
Internal Link Dist (ft)		855			571			294			502	
Turn Bay Length (ft)			100	250								
Base Capacity (vph)		4350	1366	457	5026				453			304
Starvation Cap Reductn		0	0	0	184				0			0
Spillback Cap Reductn		0	0	0	0				0			0
Storage Cap Reductn		0	0	0	0				0			0
Reduced v/c Ratio		0.64	0.04	0.18	0.45				0.21			0.01

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 72 (60%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 1.4 — Intersection LOS: A
Intersection Capacity Utilization 62.9% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 208: Environ Way/Rogerson Dr & NC 54



UNC DP TIA 2023 — No-Build (2030) PM
301: Columbia Street & Culbreth Road/Mt Carmel Church Road — Lanes, Volumes, Timings

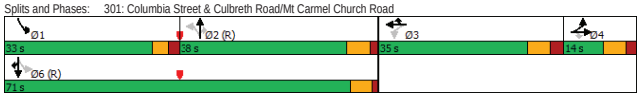
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	85	51	23	85	399	48	903	6	540	1497	196
Future Volume (vph)	106	85	51	23	85	399	48	903	6	540	1497	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	200		115	380		415	100		95	491		207
Storage Lanes	1		1	0		2	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950				0.989		0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	0	1916	2898	1787	3575	1599	1752	3504	1567
Flt Permitted	0.950				0.210		0.126			0.106		
Satd. Flow (perm)	1743	1835	1560	0	407	2898	237	3575	1599	195	3504	1567
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			138			443			140			153
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		950			859			2346			550	
Travel Time (s)		18.5			16.7			45.7			10.7	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)												3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	118	94	57	26	94	443	53	1003	7	600	1663	218
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	94	57	0	120	443	53	1003	7	600	1663	218
Turn Type	custom	NA	Perm	Perm	NA	Prot	Perm	NA	Perm	pm+pt	NA	Prot
Protected Phases	4	4			3	3		2		1	6	6
Permitted Phases	4		4	3			2		2	6		
Detector Phase	4	4	4	3	3	3	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	12.0	7.0	12.0	12.0
Minimum Split (s)	13.4	13.4	13.4	13.9	13.9	13.9	18.2	18.2	18.2	12.1	25.2	25.2
Total Split (s)	14.0	14.0	14.0	35.0	35.0	35.0	38.0	38.0	38.0	33.0	71.0	71.0
Total Split (%)	11.7%	11.7%	11.7%	29.2%	29.2%	29.2%	31.7%	31.7%	31.7%	27.5%	59.2%	59.2%
Maximum Green (s)	7.6	7.6	7.6	28.1	28.1	28.1	31.8	31.8	31.8	27.9	65.5	65.5
Yellow Time (s)	4.2	4.2	4.2	4.5	4.5	4.5	4.7	4.7	4.7	3.0	4.3	4.3
All-Red Time (s)	2.2	2.2	2.2	2.4	2.4	2.4	1.5	1.5	1.5	2.1	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4		6.9	6.9	6.2	6.2	6.2	5.1	5.5	5.5
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	6.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	15.0	0.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0	45.0	0.0	45.0	45.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)											7.0	7.0
Flash Dont Walk (s)											12.0	12.0

UNC DP TIA 2023 — No-Build (2030) PM
301: Columbia Street & Culbreth Road/Mt Carmel Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)											0	0
Act Effct Green (s)	7.6	7.6	7.6		28.1	28.1	31.8	31.8	31.8	65.9	65.5	65.5
Actuated g/C Ratio	0.06	0.06	0.06		0.23	0.23	0.26	0.26	0.26	0.55	0.55	0.55
v/c Ratio	1.07	0.81	0.25		1.26	0.44	0.85	1.06	0.01	1.28	0.87	0.24
Control Delay	159.6	99.9	2.6		218.0	4.9	121.5	87.6	0.0	177.2	27.5	7.0
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Total Delay	159.6	99.9	2.6		218.0	4.9	121.5	87.6	0.0	177.2	28.1	7.0
LOS	F	F	A		F	A	F	F	A	F	C	A
Approach Delay		105.5			50.3			88.7			62.3	
Approach LOS		F			D			F			E	
Queue Length 50th (ft)	~101	73	0		~117	0	41	~448	0	~534	461	29
Queue Length 95th (ft)	#224	#169	0		#241	44	#121	#586	m0	#783	481	68
Internal Link Dist (ft)		870			779			2266			470	
Turn Bay Length (ft)	200		115			415	100		95	491		207
Base Capacity (vph)	110	116	228		95	1017	62	947	526	469	1912	924
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	58	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.81	0.25		1.26	0.44	0.85	1.06	0.01	1.28	0.90	0.24

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 32 (27%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.28
Intersection Signal Delay: 69.8 — Intersection LOS: E
Intersection Capacity Utilization 82.5% — ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 301: Columbia Street & Culbreth Road/Mt Carmel Church Road



UNC DP TIA 2023 — No-Build (2030) PM
302: Columbia Street & Arlen Park Drive/Bennett Road — Lanes, Volumes, Timings

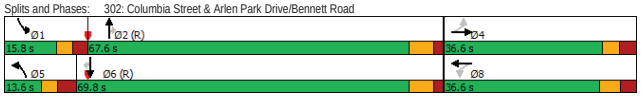
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	13	3	81	16	4	14	782	118	58	1394	119
Future Volume (vph)	72	13	3	81	16	4	14	782	118	58	1394	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	350		350	350		350
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00							0.98			
Frt		0.974			0.973				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1810	0	1770	1812	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.743			0.746			0.950			0.950		
Satd. Flow (perm)	1384	1810	0	1390	1812	0	1770	3539	1551	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			4				131			132
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		358			1313			2727			2346	
Travel Time (s)		9.8			25.6			53.1			45.7	
Confl. Bikes (#/hr)			1						1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	80	14	3	90	18	4	16	869	131	64	1549	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	17	0	90	22	0	16	869	131	64	1549	132
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	36.6	36.6		14.1	14.1		13.6	20.6	20.6	12.9	24.6	24.6
Total Split (s)	36.6	36.6		36.6	36.6		13.6	67.6	67.6	15.8	69.8	69.8
Total Split (%)	30.5%	30.5%		30.5%	30.5%		11.3%	56.3%	56.3%	13.2%	58.2%	58.2%
Maximum Green (s)	30.0	30.0		29.5	29.5		7.0	61.0	61.0	9.9	63.2	63.2
Yellow Time (s)	3.2	3.2		3.8	3.8		3.0	4.6	4.6	3.0	4.6	4.6
All-Red Time (s)	3.4	3.4		3.3	3.3		3.6	2.0	2.0	2.9	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		7.1	7.1		6.6	6.6	6.6	5.9	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		1.0	1.0		2.0	6.0	6.0	1.0	6.0	6.0
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	25.0	25.0	0.0	25.0	25.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	55.0	55.0	0.0	55.0	55.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	4.0	4.0									7.0	7.0
Flash Dont Walk (s)	26.0	26.0									10.0	10.0
Pedestrian Calls (#/hr)	0	0									0	0
Act Effct Green (s)	12.1	12.1		11.6	11.6		7.1	82.9	82.9	8.5	89.2	89.2

UNC DP TIA 2023 — No-Build (2030) PM
302: Columbia Street & Arlen Park Drive/Bennett Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.06	0.69	0.69	0.07	0.74	0.74
v/c Ratio	0.58	0.09		0.67	0.12		0.15	0.36	0.12	0.51	0.59	0.11
Control Delay	67.0	41.7		75.5	42.4		46.6	12.1	5.0	84.2	1.5	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.0	41.7		75.5	42.4		46.6	12.1	5.0	84.2	1.5	0.1
LOS	E	D		E	D		D	B	A	F	A	A
Approach Delay		62.6			69.0			11.7			4.4	
Approach LOS		E			E			B			A	
Queue Length 50th (ft)	60	10		69	13		12	156	8	53	11	0
Queue Length 95th (ft)	108	32		120	37		m29	264	m40	m61	m16	m0
Internal Link Dist (ft)		278			1233			2647			2266	
Turn Bay Length (ft)	150			150			350		350	350		350
Base Capacity (vph)	346	454		341	448		104	2444	1112	151	2631	1210
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.04		0.26	0.05		0.15	0.36	0.12	0.42	0.59	0.11

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 63 (53%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 11.3 — Intersection LOS: B
Intersection Capacity Utilization 70.8% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 302: Columbia Street & Arlen Park Drive/Bennett Road



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	317	120	138	544	11	1235	305
Future Volume (vph)	317	120	138	544	11	1235	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0	350		250		350
Storage Lanes	1	1	1		1		1
Taper Length (ft)	25		25		25		
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor		0.99					
Frt		0.850					0.850
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1770	1583	1770	3539	1770	3539	1583
Flt Permitted	0.950		0.950		0.423		
Satd. Flow (perm)	1770	1563	1770	3539	788	3539	1583
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		133					339
Link Speed (mph)	25			35		35	
Link Distance (ft)	416			1017		2727	
Travel Time (s)	11.3			19.8		53.1	
Confl. Bikes (#/hr)		1					
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	352	133	153	604	12	1372	339
Shared Lane Traffic (%)							
Lane Group Flow (vph)	352	133	153	604	12	1372	339
Turn Type	Prot	Perm	Prot	NA	Perm	NA	Perm
Protected Phases	4		5	2		6	
Permitted Phases		4			6		6
Detector Phase	4	4	5	2	6	6	6
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	12.0
Minimum Split (s)	13.1	13.1	12.8	20.4	20.0	20.0	20.0
Total Split (s)	38.0	38.0	21.0	82.0	61.0	61.0	61.0
Total Split (%)	31.7%	31.7%	17.5%	68.3%	50.8%	50.8%	50.8%
Maximum Green (s)	31.9	31.9	15.2	75.6	55.0	55.0	55.0
Yellow Time (s)	3.0	3.0	3.0	5.0	4.6	4.6	4.6
All-Red Time (s)	3.1	3.1	2.8	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	5.8	6.4	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	1.0	6.0	6.0	6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	40.0	45.0	45.0	45.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	27.8	27.8	12.8	79.7	61.4	61.4	61.4
Actuated g/C Ratio	0.23	0.23	0.11	0.66	0.51	0.51	0.51
v/c Ratio	0.86	0.29	0.81	0.26	0.03	0.76	0.35
Control Delay	64.1	7.4	82.2	9.0	4.3	9.5	1.1

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	7.4	82.2	9.0	4.3	9.5	1.1
LOS	E	A	F	A	A	A	A
Approach Delay	48.5			23.8		7.8	
Approach LOS	D			C		A	
Queue Length 50th (ft)	259	0	116	95	1	240	1
Queue Length 95th (ft)	364	48	#203	132	m2	272	1
Internal Link Dist (ft)	336			937		2647	
Turn Bay Length (ft)	150		350		250		350
Base Capacity (vph)	470	513	224	2349	403	1811	975
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.26	0.68	0.26	0.03	0.76	0.35

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBTU, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 18.6 — Intersection LOS: B
Intersection Capacity Utilization 74.3% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 303: Columbia Street & Market Street



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	21	3	83	16	3	52
Future Volume (vph)	21	3	83	16	3	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.984		0.978			
Flt Protected	0.958					0.998
Satd. Flow (prot)	1756	0	1822	0	0	1859
Flt Permitted	0.958					0.998
Satd. Flow (perm)	1756	0	1822	0	0	1859
Link Speed (mph)	25		25			25
Link Distance (ft)	398		535			551
Travel Time (s)	10.9		14.6			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	3	92	18	3	58
Shared Lane Traffic (%)						
Lane Group Flow (vph)	26	0	110	0	0	61
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 15.3% — ICU Level of Service A
Analysis Period (min) 15

Intersection
Int Delay, s/veh 1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	3	83	16	3	52
Future Vol, veh/h	21	3	83	16	3	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	3	92	18	3	58

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	165	101	0	0	110	0
Stage 1	101	-	-	-	-	-
Stage 2	64	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	826	954	-	-	1480	-
Stage 1	923	-	-	-	-	-
Stage 2	959	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	824	954	-	-	1480	-
Mov Cap-2 Maneuver	824	-	-	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	957	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	838	1480	-
HCM Lane V/C Ratio	-	-	0.032	0.002	-
HCM Control Delay (s)	-	-	9.4	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

UNC DP TIA 2023 — No-Build (2030) PM
307: Country Club Road & Boundary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	517	425	0	0	57
Future Volume (vph)	0	517	425	0	0	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	0	1611
Link Speed (mph)		25	25		30	
Link Distance (ft)		312	90		81	
Travel Time (s)		8.5	2.5		1.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	574	472	0	0	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	574	472	0	0	63
Sign Control		Free	Free		Yield	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 32.6% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
313: Ridge Road & Country Club Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	104	266	7	26	320	52
Future Volume (vph)	104	266	7	26	320	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.903				0.981	
Flt Protected				0.989	0.959	
Satd. Flow (prot)	1682	0	0	1842	1752	0
Flt Permitted				0.989	0.959	
Satd. Flow (perm)	1682	0	0	1842	1752	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	215			564	517	
Travel Time (s)	4.2			11.0	10.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	116	296	8	29	356	58
Shared Lane Traffic (%)						
Lane Group Flow (vph)	412	0	0	37	414	0
Sign Control	Free			Free	Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.4% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
313: Ridge Road & Country Club Road — HCM 2010 TWSC

Intersection
Int Delay, s/veh 8.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	104	266	7	26	320	52
Future Vol, veh/h	104	266	7	26	320	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	296	8	29	356	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	412	0	309	264
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	45	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1147	-	683	775
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	977	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1147	-	678	775
Mov Cap-2 Maneuver	-	-	-	-	678	-
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	970	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	17.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	690	-	-	1147	-
HCM Lane V/C Ratio	0.599	-	-	0.007	-
HCM Control Delay (s)	17.7	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	4	-	-	0	-

UNC DP TIA 2023 — No-Build (2030) PM
325: Columbia Street & Pittsboro Street — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	545	0	372	221	0
Future Volume (vph)	0	545	0	372	221	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			0%	4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	1825	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	1825	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	384			956	267	
Travel Time (s)	8.7			26.1	7.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	606	0	413	246	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	606	0	413	246	0
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 52.0% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
329: Pittsboro Street & Manning Drive — Lanes, Volumes, Timings

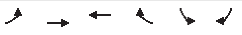


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	262	545
Future Volume (vph)	0	0	0	0	262	545
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt						
Flt Protected					0.950	0.998
Satd. Flow (prot)	0	0	0	0	1681	1766
Flt Permitted					0.950	0.998
Satd. Flow (perm)	0	0	0	0	1681	1766
Link Speed (mph)	25		30			25
Link Distance (ft)	218		384			1147
Travel Time (s)	5.9		8.7			31.3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	291	606
Shared Lane Traffic (%)					10%	
Lane Group Flow (vph)	0	0	0	0	262	635
Sign Control	Free		Free			Free

Intersection Summary

Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization	31.6%	ICU Level of Service A
Analysis Period (min)	15	

UNC DP TIA 2023 — No-Build (2030) PM
350: Fordham Blvd & Oteys Road — Lanes, Volumes, Timings



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1565	2224	12	0	130
Future Volume (vph)	0	1565	2224	12	0	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	10	10
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3536	0	0	1504
Flt Permitted						
Satd. Flow (perm)	0	3539	3536	0	0	1504
Link Speed (mph)		45	45		25	
Link Distance (ft)		2437	1661		324	
Travel Time (s)		36.9	25.2		8.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1739	2471	13	0	144
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1739	2484	0	0	144
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization	76.6%	ICU Level of Service D
Analysis Period (min)	15	

UNC DP TIA 2023 — No-Build (2030) PM
350: Fordham Blvd & Oteys Road — HCM 2010 TWSC

Intersection

Int Delay, s/veh	3.1

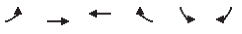
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1565	2224	12	0	130
Future Vol, veh/h	0	1565	2224	12	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1739	2471	13	0	144

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1242
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	166
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	-	-	-	-	-	166
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	94.1
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	166
HCM Lane V/C Ratio	-	-	-	0.87
HCM Control Delay (s)	-	-	-	94.1
HCM Lane LOS	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	6.1

UNC DP TIA 2023 — No-Build (2030) PM
357: Fordham Blvd & NC 54 WB Ramps — Lanes, Volumes, Timings



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1150	1428	0	0	751
Future Volume (vph)	0	1150	1428	0	0	751
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3539	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	0	0	1611
Link Speed (mph)		45	45		25	
Link Distance (ft)		1088	445		1226	
Travel Time (s)		16.5	6.7		33.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1278	1587	0	0	834
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1278	1587	0	0	834
Sign Control		Free	Free		Yield	

Intersection Summary

Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization	92.6%	ICU Level of Service F
Analysis Period (min)	15	

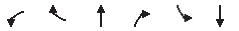
UNC DP TIA 2023 — No-Build (2030) PM
358: NC 54 EB Ramps & Fordham Blvd — Lanes, Volumes, Timings



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	787	404	0	1478	0	0
Future Volume (vph)	787	404	0	1478	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.949					
Flt Protected						
Satd. Flow (prot)	3359	0	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	3359	0	0	3539	0	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	445			1758	975	
Travel Time (s)	6.7			26.6	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	874	449	0	1642	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1323	0	0	1642	0	0
Sign Control	Free			Free	Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 80.0% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
359: Columbia Street & NC 54 EB Ramps — Lanes, Volumes, Timings



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	644	728	0	1968
Future Volume (vph)	0	0	644	728	0	1968
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt			0.920			
Flt Protected						
Satd. Flow (prot)	0	0	3256	0	0	3539
Flt Permitted						
Satd. Flow (perm)	0	0	3256	0	0	3539
Link Speed (mph)	35		25			25
Link Distance (ft)	424		550			219
Travel Time (s)	8.3		15.0			6.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	716	809	0	2187
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1525	0	0	2187
Sign Control	Free		Free			Free

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 57.7% — ICU Level of Service B
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
360: NC 54 EB Ramps & Ramp Connector — Lanes, Volumes, Timings



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	105	0	0	728	0	0
Future Volume (vph)	105	0	0	728	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	1863	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	1863	0	0
Link Speed (mph)	30			35	30	
Link Distance (ft)	270			424	706	
Travel Time (s)	6.1			8.3	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	0	0	809	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	117	0	0	809	0	0
Sign Control	Free			Yield	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 50.8% — ICU Level of Service A
Analysis Period (min) 15

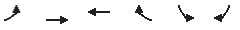
UNC DP TIA 2023 — No-Build (2030) PM
361: NC 54 EB Ramps & Fordham Blvd — Lanes, Volumes, Timings



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	787	0	0	1478	0	833
Future Volume (vph)	787	0	0	1478	0	833
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1611
Link Speed (mph)	45			45	30	
Link Distance (ft)	1758			301	706	
Travel Time (s)	26.6			4.6	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	874	0	0	1642	0	926
Shared Lane Traffic (%)						
Lane Group Flow (vph)	874	0	0	1642	0	926
Sign Control	Free			Free	Yield	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 80.0% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
362: Fordham Blvd & NC 54 WB Ramps — Lanes, Volumes, Timings

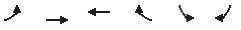


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1620	1478	963	0	0
Future Volume (vph)	0	1620	1478	963	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			250	0	0
Storage Lanes	0			1	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3539	3539	1583	0	0
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	1583	0	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		301	2437		1188	
Travel Time (s)		4.6	36.9		32.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1800	1642	1070	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1800	1642	1070	0	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 63.0% — ICU Level of Service B
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
1051: US 15/501 NB & NB/EB U-Turn — Lanes, Volumes, Timings



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	374	2135	0	0	0	0
Future Volume (vph)	374	2135	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	3400	3505	0	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3400	3505	0	0	0	0
Link Speed (mph)		30	45		30	
Link Distance (ft)		605	492		205	
Travel Time (s)		13.8	7.5		4.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	416	2372	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	416	2372	0	0	0	0
Sign Control		Free	Free		Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 112.4% — ICU Level of Service H
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
1052: SB/WB U-Turn & US 15/501 SB — Lanes, Volumes, Timings



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	64	1906	0	0
Future Volume (vph)	0	0	64	1906	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	250		0	0
Storage Lanes		0	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00
Frt						
Flt Protected			0.950			
Satd. Flow (prot)	0	0	3433	3539	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	3433	3539	0	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	1322			777	186	
Travel Time (s)	20.0			11.8	4.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	71	2118	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	71	2118	0	0
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 79.9% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — No-Build (2030) PM
5001: US 15/501/US 15/501 SB & US 15/501 NB — Lanes, Volumes, Timings



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	0	1368	0	1082	0	0
Future Volume (vph)	0	1368	0	1082	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	0	2787	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	0	2787	0	3539	0	0
Link Speed (mph)	45			45	45	
Link Distance (ft)	811			1322	1186	
Travel Time (s)	12.3			20.0	18.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1520	0	1202	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1520	0	1202	0	0
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 51.2% — ICU Level of Service A
Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1717	0	2135
Future Volume (vph)	0	0	0	1717	0	2135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.88
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	0	2787
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	0	2787
Link Speed (mph)	45			45	45	
Link Distance (ft)	295			829	492	
Travel Time (s)	4.5			12.6	7.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1908	0	2372
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1908	0	2372
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 78.0% ICU Level of Service D
Analysis Period (min) 15

INTERSECTION LEVEL OF SERVICE WORKSHEETS
BUILD (2030) AM

UNC DP TIA 2023 — Build (2030) AM
1: Columbia Street & Rosemary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	1	83	18	5	6	84	347	33	25	502	107
Future Volume (vph)	96	1	83	18	5	6	84	347	33	25	502	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	0		0	0		0	125		0	0		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			50			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.98	0.98		0.99	0.98		0.96	0.99		0.93		0.88
Frt		0.852			0.919			0.987				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1433	1394	0	1486	1412	0	1433	2893	0	1433	2867	1378
Flt Permitted	0.749			0.697			0.364			0.463		
Satd. Flow (perm)	1106	1394	0	1081	1412	0	529	2893	0	649	2867	1211
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		92			7			11				119
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		783			945			370			503	
Travel Time (s)		21.4			25.8			10.1			13.7	
Confl. Peds. (#/hr)	19		8	8		19	32		49	49		32
Confl. Bikes (#/hr)			5									4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	107	1	92	20	6	7	93	386	37	28	558	119
Shared Lane Traffic (%)												
Lane Group Flow (vph)	107	93	0	20	13	0	93	423	0	28	558	119
Turn Type	D.P+P	NA		D.Pm	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		4	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.8	31.0		31.0	32.0		12.8	22.8		12.1	21.8	12.8
Total Split (s)	14.0	46.0		46.0	32.0		14.0	41.9		12.1	40.0	14.0
Total Split (%)	14.0%	46.0%		46.0%	32.0%		14.0%	41.9%		12.1%	40.0%	14.0%
Maximum Green (s)	8.2	40.0		40.0	26.0		8.2	36.1		7.0	34.2	8.2
Yellow Time (s)	3.0	3.2		3.2	3.2		3.0	3.3		3.0	3.3	3.0
All-Red Time (s)	2.8	2.8		2.8	2.8		2.8	2.5		2.1	2.5	2.8
Lost Time Adjust (s)	-0.8	-0.8		-1.0	-1.0		-0.8	-0.8		0.1	0.1	-0.8
Total Lost Time (s)	5.0	5.2		5.0	5.0		5.0	5.0		5.2	5.9	5.0
Lead/Lag	Lag				Lead		Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Recall Mode	None	Ped		Ped	Ped		None	C-Max		None	C-Max	None
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)		18.0		18.0	19.0			10.0			9.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	34.8	39.6		39.8	27.0		46.2	42.9		46.9	38.1	46.8
Actuated g/C Ratio	0.35	0.40		0.40	0.27		0.46	0.43		0.47	0.38	0.47

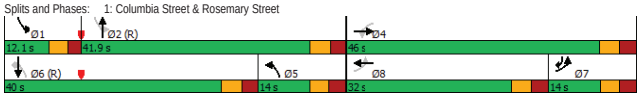
UNC DP TIA 2023 — Build (2030) AM
1: Columbia Street & Rosemary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.26	0.15		0.05	0.03		0.29	0.34		0.08	0.51	0.19
Control Delay	22.3	4.9		19.0	19.5		9.7	10.9		13.5	26.8	3.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	22.3	4.9		19.0	19.5		9.7	10.9		13.5	26.8	3.4
LOS	C	A		B	B		A	B		B	C	A
Approach Delay		14.2			19.2			10.7			22.4	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)	44	0		8	3		16	56		9	148	0
Queue Length 95th (ft)	81	31		23	18		m28	75		23	203	28
Internal Link Dist (ft)		703			865			290			423	
Turn Bay Length (ft)							125					
Base Capacity (vph)	427	623		443	386		325	1248		358	1092	657
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.25	0.15		0.05	0.03		0.29	0.34		0.08	0.51	0.18

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 54 (54%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 17.0 — Intersection LOS: B
Intersection Capacity Utilization 56.2% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Columbia Street & Rosemary Street



UNC DP TIA 2023 — Build (2030) AM
2: Columbia Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	275	52	75	336	116	38	298	79	100	471	53
Future Volume (vph)	54	275	52	75	336	116	38	298	79	100	471	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	0		0	250		0	600		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.91	0.98		0.94	0.95		0.98	0.95		0.88	0.99	
Frt		0.976			0.961			0.968			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1433	3050	0	1486	2713	0	1433	2743	0	1433	2805	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1302	3050	0	1390	2713	0	1400	2743	0	1261	2805	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			48			31			13	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		795			952			972			370	
Travel Time (s)		21.7			26.0			26.5			10.1	
Confl. Peds. (#/hr)	135		79	79		135	38		158	158		38
Confl. Bikes (#/hr)			1			6			1			4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	60	306	58	83	373	129	42	331	88	111	523	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	364	0	83	502	0	42	419	0	111	582	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.4	28.2		12.9	28.2		12.9	27.9		12.9	27.7	
Total Split (s)	16.0	33.0		17.0	34.0		13.0	29.0		21.0	37.0	
Total Split (%)	16.0%	33.0%		17.0%	34.0%		13.0%	29.0%		21.0%	37.0%	
Maximum Green (s)	10.6	26.8		11.1	27.8		7.1	23.1		15.1	31.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.3		3.0	3.1	
All-Red Time (s)	2.4	3.2		2.9	3.2		2.9	2.6		2.9	2.6	
Lost Time Adjust (s)	-0.4	-1.2		-0.9	-1.2		-0.9	-0.9		-0.9	-0.7	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lead		Lag	Lead		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	Ped		None	Ped	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	9.1	37.5		10.0	38.3		8.0	23.1		12.0	32.3	
Actuated g/C Ratio	0.09	0.38		0.10	0.38		0.08	0.23		0.12	0.32	

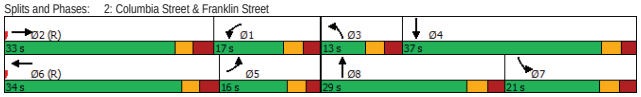
UNC DP TIA 2023 — Build (2030) AM
2: Columbia Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.46	0.31		0.56	0.47		0.37	0.64		0.65	0.64	
Control Delay	54.4	23.9		54.7	20.4		53.3	37.0		40.2	16.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.1	
Total Delay	54.4	23.9		54.7	20.4		53.3	37.0		40.2	16.4	
LOS	D	C		D	C		D	D		D	B	
Approach Delay		28.2			25.2			38.5			20.2	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	37	83		53	103		26	117		69	176	
Queue Length 95th (ft)	77	136		m98	146		61	168		130	245	
Internal Link Dist (ft)		715			872			892			290	
Turn Bay Length (ft)				250			600			125		
Base Capacity (vph)	157	1156		178	1067		115	681		229	959	
Starvation Cap Reductn	0	0		0	0		0	0		0	35	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.38	0.31		0.47	0.47		0.37	0.62		0.48	0.63	

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 97 (97%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 27.0 — Intersection LOS: C
Intersection Capacity Utilization 65.3% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Columbia Street & Franklin Street



UNC DP TIA 2023 — Build (2030) AM
3: Raleigh Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	304	108	61	413	138	127	192	37	46	301	26
Future Volume (vph)	14	304	108	61	413	138	127	192	37	46	301	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	10	9	10	11	12	12	12	10	10	10
Storage Length (ft)	100		0	100		0	0		0	150		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.98		0.98	0.98			0.99		0.99	1.00	
Frt		0.961			0.962			0.986			0.988	
Flt Protected	0.950			0.950				0.982		0.950		
Satd. Flow (prot)	1433	2713	0	1433	2807	0	0	1619	0	1486	1541	0
Flt Permitted	0.375			0.486				0.724		0.518		
Satd. Flow (perm)	556	2713	0	719	2807	0	0	1188	0	804	1541	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		109			100			16			10	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1179			1100			994			364	
Travel Time (s)		32.2			30.0			27.1			9.9	
Confl. Peds. (#/hr)	19		15	15		19	29		17	17		29
Confl. Bikes (#/hr)			2			7			1			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	16	338	120	68	459	153	141	213	41	51	334	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	458	0	68	612	0	0	395	0	51	363	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		D.Pm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		6	6		7	4		4	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	19.8	19.8		19.8	19.8		8.0	20.0		20.0	20.0	
Total Split (s)	22.0	22.0		22.0	22.0		8.0	28.0		28.0	20.0	
Total Split (%)	44.0%	44.0%		44.0%	44.0%		16.0%	56.0%		56.0%	40.0%	
Maximum Green (s)	17.2	17.2		17.2	17.2		4.0	24.0		24.0	16.0	
Yellow Time (s)	3.3	3.3		3.1	3.1		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.7	1.7		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	-0.1	-0.1		-0.1	-0.1			-0.6		-1.2	-1.2	
Total Lost Time (s)	4.7	4.7		4.7	4.7			3.4		2.8	2.8	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)	4.0	4.0		4.0	4.0			5.0		5.0	5.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)	19.0	19.0		19.0	19.0			22.9		23.5	23.5	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.46		0.47	0.47	

UNC DP TIA 2023 — Build (2030) AM
3: Raleigh Street & Franklin Street — Lanes, Volumes, Timings

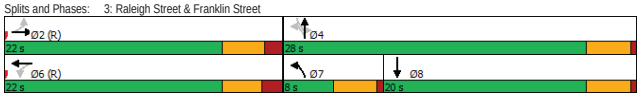
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.08	0.42		0.25	0.54			0.71		0.13	0.50	
Control Delay	7.6	7.6		10.9	9.7			18.5		7.5	11.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	7.6	7.6		10.9	9.7			18.5		7.5	11.0	
LOS	A	A		B	A			B		A	B	
Approach Delay		7.6			9.8			18.5			10.6	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	3	66		10	64			72		7	57	
Queue Length 95th (ft)	m8	40		17	15			#169		21	114	
Internal Link Dist (ft)		1099			1020			914			284	
Turn Bay Length (ft)	100			100						150		
Base Capacity (vph)	215	1116		278	1148			601		411	733	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.07	0.41		0.24	0.53			0.66		0.12	0.50	

Intersection Summary

Area Type: CBD
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 4 (8%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 11.2 — Intersection LOS: B
Intersection Capacity Utilization 82.1% — ICU Level of Service E
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Raleigh Street & Franklin Street



Build (2030) AM.syn — VHB

UNC DP TIA 2023 — Build (2030) AM
4: Merritt Mill Road & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lane Configurations							
Traffic Volume (vph)	64	43	149	375	162	87	
Future Volume (vph)	64	43	149	375	162	87	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	14	15	15	9	12	
Storage Length (ft)	0	250		0	25		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	0.92	0.92	0.97		1.00		
Frt		0.850	0.903				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1699	1520	1613	0	1433	1676	
Flt Permitted	0.950				0.304		
Satd. Flow (perm)	1568	1396	1613	0	459	1676	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		48	158				
Link Speed (mph)	25		25			25	
Link Distance (ft)	1645		945			1064	
Travel Time (s)	44.9		25.8			29.0	
Confl. Peds. (#/hr)	12	22		1	1		
Confl. Bikes (#/hr)		2		22			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	71	48	166	417	180	97	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	71	48	583	0	180	97	
Turn Type	Prot	pm+ov	NA		D.P+P	NA	
Protected Phases	3	1	2		1	6	4
Permitted Phases		3			2		
Detector Phase	3	1	2		1	6	
Switch Phase							
Minimum Initial (s)	7.0	7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.1	11.6	14.9		11.6	14.9	25.0
Total Split (s)	12.2	15.0	37.8		15.0	52.8	25.0
Total Split (%)	13.6%	16.7%	42.0%		16.7%	58.7%	28%
Maximum Green (s)	7.1	10.4	32.9		10.4	47.9	22.0
Yellow Time (s)	3.0	3.0	3.1		3.0	3.1	3.0
All-Red Time (s)	2.1	1.6	1.8		1.6	1.8	0.0
Lost Time Adjust (s)	0.1	0.4	0.1		0.4	0.4	
Total Lost Time (s)	5.2	5.0	5.0		5.0	5.3	
Lead/Lag	Lead	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Vehicle Extension (s)	1.0	2.0	3.0		2.0	3.0	0.2
Recall Mode	None	None	Min		None	Min	None
Walk Time (s)							7.0
Flash Dont Walk (s)							15.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	7.3	12.1	25.5		33.8	41.6	
Actuated g/C Ratio	0.14	0.24	0.50		0.67	0.82	

Build (2030) AM.syn — VHB

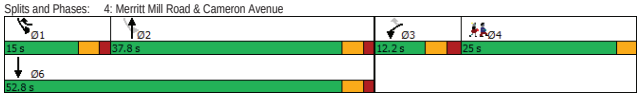
UNC DP TIA 2023 — Build (2030) AM
4: Merritt Mill Road & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
v/c Ratio	0.29	0.12	0.66		0.39	0.07	
Control Delay	27.3	5.9	12.2		5.5	2.6	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	27.3	5.9	12.2		5.5	2.6	
LOS	C	A	B		A	A	
Approach Delay	18.7		12.2			4.5	
Approach LOS	B		B			A	
Queue Length 50th (ft)	20	0	101		16	8	
Queue Length 95th (ft)	63	19	213		31	18	
Internal Link Dist (ft)	1565		865			984	
Turn Bay Length (ft)		250			25		
Base Capacity (vph)	247	452	1149		528	1487	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.29	0.11	0.51		0.34	0.07	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 50.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 10.8 — Intersection LOS: B
Intersection Capacity Utilization 62.9% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Merritt Mill Road & Cameron Avenue



Build (2030) AM.syn — VHB

UNC DP TIA 2023 — Build (2030) AM
5: Pittsboro Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø4
Lane Configurations								
Traffic Volume (vph)	157	189	660	203	0	0		
Future Volume (vph)	157	189	660	203	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	12	11	12	12	12		
Storage Length (ft)		0	0		0	0		
Storage Lanes		0	2		0	0		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00		
Ped Bike Factor	0.97		0.99					
Frt	0.926							
Flt Protected			0.950					
Satd. Flow (prot)	1503	0	2987	1676	0	0		
Flt Permitted			0.950					
Satd. Flow (perm)	1503	0	2964	1676	0	0		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)	57							
Link Speed (mph)	25			25	25			
Link Distance (ft)	1117			376	564			
Travel Time (s)	30.5			10.3	15.4			
Confl. Peds. (#/hr)		2	2		31			
Confl. Bikes (#/hr)		81						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Adj. Flow (vph)	174	210	733	226	0	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	384	0	733	226	0	0		
Turn Type	NA		Prot	NA				
Protected Phases	2		1 4	6			1	4
Permitted Phases								
Detector Phase	2		1 4	6				
Switch Phase								
Minimum Initial (s)	10.0			10.0			7.0	7.0
Minimum Split (s)	16.2			15.0			12.1	20.0
Total Split (s)	69.0			120.0			51.0	20.0
Total Split (%)	49.3%			85.7%			36%	14%
Maximum Green (s)	63.8			115.0			45.9	16.0
Yellow Time (s)	3.1			3.3			3.0	3.0
All-Red Time (s)	2.1			1.7			2.1	1.0
Lost Time Adjust (s)	-0.2			0.0				
Total Lost Time (s)	5.0			5.0				
Lead/Lag	Lead						Lag	
Lead-Lag Optimize?								
Vehicle Extension (s)	1.0			1.0			4.0	0.2
Recall Mode	Min			C-Min			C-Max	None
Walk Time (s)	7.0							7.0
Flash Dont Walk (s)	4.0							9.0
Pedestrian Calls (#/hr)	0							0
Act Effct Green (s)	37.5		92.5	124.0				
Actuated g/C Ratio	0.27		0.66	0.89				

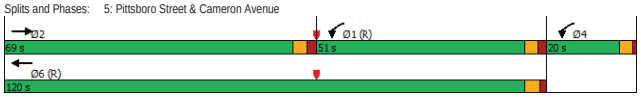
UNC DP TIA 2023 — Build (2030) AM
5: Pittsboro Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø4
v/c Ratio	0.86		0.37	0.15				
Control Delay	59.9		6.7	2.2				
Queue Delay	0.0		0.4	1.0				
Total Delay	59.9		7.0	3.2				
LOS	E		A	A				
Approach Delay	59.9			6.1				
Approach LOS	E			A				
Queue Length 50th (ft)	291		61	37				
Queue Length 95th (ft)	370		m141	m46				
Internal Link Dist (ft)	1037			296	484			
Turn Bay Length (ft)								
Base Capacity (vph)	718		2165	1484				
Starvation Cap Reductn	0		845	1019				
Spillback Cap Reductn	0		0	0				
Storage Cap Reductn	0		0	0				
Reduced v/c Ratio	0.53		0.56	0.49				

Intersection Summary

Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 92 (66%), Referenced to phase 1:WBL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 21.5 — Intersection LOS: C
Intersection Capacity Utilization 51.4% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Pittsboro Street & Cameron Avenue



UNC DP TIA 2023 — Build (2030) AM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	101	0	0	232	40	120	373	102	90	0	554
Future Volume (vph)	20	101	0	0	232	40	120	373	102	90	0	554
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	10	10	10	11	11	12
Storage Length (ft)	110		0	0		0	0		0	300		0
Storage Lanes	1		0	0		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.95	1.00	1.00	0.88
Ped Bike Factor	0.94				0.98		0.88	0.87		0.73		0.86
Frt					0.980			0.969				0.850
Flt Protected	0.950						0.950	0.999		0.950		
Satd. Flow (prot)	1540	1676	0	0	1607	0	1353	2415	0	1540	0	2508
Flt Permitted	0.198						0.950	0.999		0.950		
Satd. Flow (perm)	302	1676	0	0	1607	0	1196	2409	0	1116	0	2152
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)					5			21				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		376			2112			887			972	
Travel Time (s)		10.3			57.6			24.2			26.5	
Confl. Peds. (#/hr)	80		194	194		80	33		156	156		33
Confl. Bikes (#/hr)			58			2			2			7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	22	112	0	0	258	44	133	414	113	100	0	616
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	22	112	0	0	302	0	120	540	0	100	0	616
Turn Type	Perm	NA			NA		Split	NA		Prot		Prot
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Detector Phase	4	4			8		2	2		1		1
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		7.0	7.0		7.0		7.0
Minimum Split (s)	27.1	27.1			30.2		23.2	23.2		25.6		25.6
Total Split (s)	32.0	32.0			32.0		38.8	38.8		41.2		41.2
Total Split (%)	22.9%	22.9%			22.9%		27.7%	27.7%		29.4%		29.4%
Maximum Green (s)	25.9	25.9			25.8		32.6	32.6		35.6		35.6
Yellow Time (s)	3.1	3.1			3.2		3.1	3.1		3.0		3.0
All-Red Time (s)	3.0	3.0			3.0		3.1	3.1		2.6		2.6
Lost Time Adjust (s)	-1.2	-1.2			-1.2		-1.2	-1.2		-0.6		-0.6
Total Lost Time (s)	4.9	4.9			5.0		5.0	5.0		5.0		5.0
Lead/Lag							Lag	Lag		Lead		Lead
Lead-Lag Optimize?							Yes	Yes		Yes		Yes
Vehicle Extension (s)	2.0	2.0			2.0		4.0	4.0		4.0		4.0
Recall Mode	Min	Min			Min		C-Max	C-Max		None		None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0		7.0
Flash Dont Walk (s)	10.0	10.0			17.0		5.0	5.0		13.0		13.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0		0
Act Effct Green (s)	27.1	27.1			27.0		33.8	33.8		36.2		36.2
Actuated g/C Ratio	0.19	0.19			0.19		0.24	0.24		0.26		0.26

UNC DP TIA 2023 — Build (2030) AM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	20%
Maximum Green (s)	24.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	0.2
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	

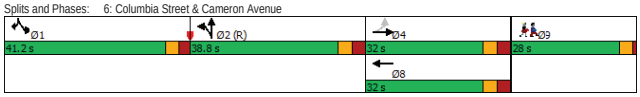
UNC DP TIA 2023 — Build (2030) AM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.38	0.35			0.96		0.37	0.90		0.25		0.95
Control Delay	31.4	16.9			97.4		48.1	69.0		43.3		76.0
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		0.0
Total Delay	31.4	16.9			97.4		48.1	69.0		43.3		76.0
LOS	C	B			F		D	E		D		E
Approach Delay		19.3			97.4			65.2			71.5	
Approach LOS		B			F			E			E	
Queue Length 50th (ft)	13	67			272		101	254		73		315
Queue Length 95th (ft)	m25	95			#462		169	#367		126		#447
Internal Link Dist (ft)		296			2032			807			892	
Turn Bay Length (ft)	110									300		
Base Capacity (vph)	58	324			313		326	598		398		648
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		0
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.38	0.35			0.96		0.37	0.90		0.25		0.95

Intersection Summary

Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 4 (3%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 69.7 — Intersection LOS: E
Intersection Capacity Utilization 70.6% — ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Columbia Street & Cameron Avenue



UNC DP TIA 2023 — Build (2030) AM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	Ø9
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — Build (2030) AM
7: Raleigh Street & Cameron Avenue/Country Club Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	101	30	32	291	274	33	42	12	276	152	76
Future Volume (vph)	26	101	30	32	291	274	33	42	12	276	152	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	9	11	11	10	10	10	10	12	12
Storage Length (ft)	0		0	100		0	100		0	75		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			100			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97		0.95	0.94		0.89	0.94		0.82	0.94	
Frt		0.974			0.927			0.967			0.950	
Flt Protected		0.992		0.950			0.950			0.950		
Satd. Flow (prot)	0	1581	0	1433	1410	0	1486	1428	0	1486	1496	0
Flt Permitted		0.862		0.577			0.602			0.486		
Satd. Flow (perm)	0	1366	0	825	1410	0	840	1428	0	624	1496	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					78			13			28	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2112			312			770			994	
Travel Time (s)		57.6			8.5			21.0			27.1	
Confl. Peds. (#/hr)	37		34	34		37	52		77	77		52
Confl. Bikes (#/hr)			12			6			8			7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	112	33	36	323	304	37	47	13	307	169	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	174	0	36	627	0	37	60	0	307	253	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.1	21.1		12.6	21.6		12.3	21.3		11.9	19.1	
Total Split (s)	34.1	34.1		12.6	46.7		12.3	21.3		17.0	26.0	
Total Split (%)	40.1%	40.1%		14.8%	54.9%		14.5%	25.1%		20.0%	30.6%	
Maximum Green (s)	28.0	28.0		7.0	41.1		7.0	16.0		12.1	20.9	
Yellow Time (s)	3.3	3.3		3.0	3.1		3.0	3.1		3.0	3.1	
All-Red Time (s)	2.8	2.8		2.6	2.5		2.3	2.2		1.9	2.0	
Lost Time Adjust (s)		-1.1		-0.6	-0.6		-0.3	-0.3		0.1	-0.1	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)	7.0	7.0			7.0			7.0			7.0	
Flash Dont Walk (s)	8.0	8.0			8.0			7.0			7.0	
Pedestrian Calls (#/hr)	0	0			0			0			0	
Act Effct Green (s)		39.0		46.6	46.6		16.9	11.0		28.3	21.1	
Actuated g/C Ratio		0.46		0.55	0.55		0.20	0.13		0.33	0.25	

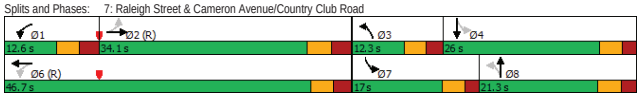
UNC DP TIA 2023 — Build (2030) AM
7: Raleigh Street & Cameron Avenue/Country Club Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.28		0.07	0.78		0.17	0.31		0.86	0.65	
Control Delay		19.7		11.3	23.5		16.1	23.2		48.0	34.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		19.7		11.3	23.5		16.1	23.2		48.0	34.2	
LOS		B		B	C		B	C		D	C	
Approach Delay		19.7			22.9			20.5			41.7	
Approach LOS		B			C			C			D	
Queue Length 50th (ft)		64		9	226		13	24		133	115	
Queue Length 95th (ft)		124		25	#474		23	30		#207	189	
Internal Link Dist (ft)		2032			232			690			914	
Turn Bay Length (ft)				100			100			75		
Base Capacity (vph)		626		506	807		222	284		358	428	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.28		0.07	0.78		0.17	0.21		0.86	0.59	

Intersection Summary

Area Type: CBD
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 84 (99%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 29.4 — Intersection LOS: C
Intersection Capacity Utilization 76.0% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Raleigh Street & Cameron Avenue/Country Club Road



UNC DP TIA 2023 — Build (2030) AM
8: Pittsboro Street & McCauley Street/South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	116	37	176	60	0	0	0	0	94	693	10
Future Volume (vph)	0	116	37	176	60	0	0	0	0	94	693	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			50			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor		0.96		0.90							0.97	
Frt		0.967									0.998	
Flt Protected				0.950							0.994	
Satd. Flow (prot)	0	1403	0	1593	1676	0	0	0	0	0	3152	0
Flt Permitted				0.629							0.994	
Satd. Flow (perm)	0	1403	0	947	1676	0	0	0	0	0	3077	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27									2	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1050			519			1147			237	
Travel Time (s)		28.6			14.2			31.3			6.5	
Confl. Peds. (#/hr)	85		80	80		85	75		86	86		75
Confl. Bikes (#/hr)			48			1						32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)		0	0									
Adj. Flow (vph)	0	129	41	196	67	0	0	0	0	104	770	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	170	0	196	67	0	0	0	0	0	885	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		22.8		23.6	23.6					23.3	23.3	
Total Split (s)		32.0		32.0	32.0					38.0	38.0	
Total Split (%)		45.7%		45.7%	45.7%					54.3%	54.3%	
Maximum Green (s)		27.2		26.4	26.4					32.7	32.7	
Yellow Time (s)		3.3		3.0	3.0					3.3	3.3	
All-Red Time (s)		1.5		2.6	2.6					2.0	2.0	
Lost Time Adjust (s)		-0.3		-0.3	-0.3						-0.1	
Total Lost Time (s)		4.5		5.3	5.3						5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		Ped		Ped	Ped					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		6.0		7.0	7.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		20.8		20.0	20.0						39.5	
Actuated g/C Ratio		0.30		0.29	0.29						0.56	

Build (2030) AM.syn — VHB

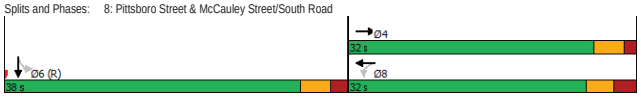
UNC DP TIA 2023 — Build (2030) AM
8: Pittsboro Street & McCauley Street/South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.39		0.73	0.14						0.51	
Control Delay		17.8		37.7	17.3						5.6	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		17.8		37.7	17.3						5.6	
LOS		B		D	B						A	
Approach Delay		17.8			32.5						5.6	
Approach LOS		B			C						A	
Queue Length 50th (ft)		48		76	21						78	
Queue Length 95th (ft)		83		128	42						98	
Internal Link Dist (ft)		970			439			1067			157	
Turn Bay Length (ft)				100								
Base Capacity (vph)		567		361	639						1738	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.30		0.54	0.10						0.51	

Intersection Summary

Area Type: CBD
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 6 (9%), Referenced to phase 6:SBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 12.5 — Intersection LOS: B
Intersection Capacity Utilization 58.9% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 8: Pittsboro Street & McCauley Street/South Road



Build (2030) AM.syn — VHB

UNC DP TIA 2023 — Build (2030) AM
9: Columbia Street & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	250	0	0	260	105	67	470	226	0	0	0
Future Volume (vph)	26	250	0	0	260	105	67	470	226	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	13	13	12	11	11	11	11	11
Storage Length (ft)	75		0	0		125	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.95				1.00	0.91		0.92				
Frt					0.994	0.850		0.956				
Flt Protected	0.950							0.996				
Satd. Flow (prot)	1593	1788	0	0	1630	1399	0	3899	0	0	0	0
Flt Permitted	0.950							0.996				
Satd. Flow (perm)	1512	1788	0	0	1630	1276	0	3874	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4	169		230				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		519			696			500			887	
Travel Time (s)		14.2			19.0			13.6			24.2	
Confl. Peds. (#/hr)	79		131	131		79	56		176	176		56
Confl. Bikes (#/hr)			20			1			8			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	278	0	0	289	117	74	522	251	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	29	278	0	0	301	105	0	847	0	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA				
Protected Phases	7	4			8			2				
Permitted Phases						8	2					
Detector Phase	7	4			8	8	2	2				
Switch Phase												
Minimum Initial (s)	4.0	7.0			7.0	7.0	10.0	10.0				
Minimum Split (s)	8.0	12.6			20.0	20.0	26.9	26.9				
Total Split (s)	8.0	28.0			20.0	20.0	27.0	27.0				
Total Split (%)	14.5%	50.9%			36.4%	36.4%	49.1%	49.1%				
Maximum Green (s)	4.0	22.4			17.0	17.0	21.1	21.1				
Yellow Time (s)	3.5	3.5			3.0	3.0	3.4	3.4				
All-Red Time (s)	0.5	2.1			0.0	0.0	2.5	2.5				
Lost Time Adjust (s)	-0.6	-0.6			-0.5	-0.5		-0.9				
Total Lost Time (s)	3.4	5.0			2.5	2.5		5.0				
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	2.0			0.2	0.2	2.0	2.0				
Recall Mode	None	None			None	None	Min	Min				
Walk Time (s)					7.0	7.0	7.0	7.0				
Flash Dont Walk (s)					10.0	10.0	14.0	14.0				
Pedestrian Calls (#/hr)					0	0	0	0				
Act Effct Green (s)	5.3	12.2			13.0	13.0		16.7				
Actuated g/C Ratio	0.16	0.37			0.39	0.39		0.50				

Build (2030) AM.syn — VHB

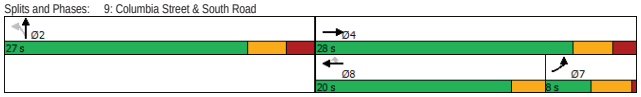
UNC DP TIA 2023 — Build (2030) AM
9: Columbia Street & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.11	0.42			0.47	0.17		0.41				
Control Delay	19.2	11.6			12.7	1.7		7.0				
Queue Delay	0.0	0.0			0.0	0.0		0.0				
Total Delay	19.2	11.6			12.7	1.7		7.0				
LOS	B	B			B	A		A				
Approach Delay		12.3			9.8			7.0				
Approach LOS		B			A			A				
Queue Length 50th (ft)	4	35			34	0		26				
Queue Length 95th (ft)	28	100			144	11		80				
Internal Link Dist (ft)		439			616			420			807	
Turn Bay Length (ft)	75					125						
Base Capacity (vph)	256	1280			968	825		2758				
Starvation Cap Reductn	0	0			0	0		0				
Spillback Cap Reductn	0	0			0	0		0				
Storage Cap Reductn	0	0			0	0		0				
Reduced v/c Ratio	0.11	0.22			0.31	0.13		0.31				

Intersection Summary

Area Type: CBD
Cycle Length: 55
Actuated Cycle Length: 33.2
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 8.8 — Intersection LOS: A
Intersection Capacity Utilization 58.9% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 9: Columbia Street & South Road



Build (2030) AM.syn — VHB

UNC DP TIA 2023 — Build (2030) AM
10: South Road & Raleigh Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	58	220	349	25	47	116
Future Volume (vph)	58	220	349	25	47	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	11	11
Storage Length (ft)	225			190	75	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93			0.85	0.79	0.47
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	1676	1621	1378	1540	1378
Flt Permitted	0.505				0.950	
Satd. Flow (perm)	791	1676	1621	1168	1216	653
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				28		129
Link Speed (mph)		25	25		25	
Link Distance (ft)		516	1148		454	
Travel Time (s)		14.1	31.3		12.4	
Confl. Peds. (#/hr)	72			72	94	243
Confl. Bikes (#/hr)				3		14
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	64	244	388	28	52	129
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	244	388	28	52	129
Turn Type	D.P+P	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	6			6		4
Detector Phase	5	2	6	6	4	5
Switch Phase						
Minimum Initial (s)	7.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	12.6	15.8	28.8	28.8	24.8	12.6
Total Split (s)	15.0	60.0	45.0	45.0	25.0	15.0
Total Split (%)	17.6%	70.6%	52.9%	52.9%	29.4%	17.6%
Maximum Green (s)	9.4	54.2	39.2	39.2	19.2	9.4
Yellow Time (s)	3.0	3.2	3.2	3.2	3.0	3.0
All-Red Time (s)	2.6	2.6	2.6	2.6	2.8	2.6
Lost Time Adjust (s)	-0.6	-0.7	-0.8	-0.8	-0.6	-0.6
Total Lost Time (s)	5.0	5.1	5.0	5.0	5.2	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Vehicle Extension (s)	1.0	3.0	1.0	1.0	2.0	1.0
Recall Mode	None	C-Min	Min	Min	None	None
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			16.0	16.0	12.0	
Pedestrian Calls (#/hr)			0	0	0	
Act Effct Green (s)	66.2	73.2	58.6	58.6	8.7	13.4
Actuated g/C Ratio	0.78	0.86	0.69	0.69	0.10	0.16

UNC DP TIA 2023 — Build (2030) AM
10: South Road & Raleigh Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.09	0.17	0.35	0.03	0.33	0.47
Control Delay	3.7	3.7	7.8	2.8	30.3	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	3.7	7.8	2.8	30.3	8.9
LOS	A	A	A	A	C	A
Approach Delay		3.7	7.5		15.0	
Approach LOS		A	A		B	
Queue Length 50th (ft)	6	27	88	0	12	1
Queue Length 95th (ft)	m19	79	156	10	m31	m12
Internal Link Dist (ft)		436	1068		374	
Turn Bay Length (ft)	225			190	75	
Base Capacity (vph)	732	1443	1118	814	358	311
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.17	0.35	0.03	0.15	0.41

Intersection Summary

Area Type: CBD
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 44 (52%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 7.7 — Intersection LOS: A
Intersection Capacity Utilization 54.7% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: South Road & Raleigh Street



UNC DP TIA 2023 — Build (2030) AM
11: Country Club Road & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	180	33	612	400	538	20	39	84	295	161	12
Future Volume (vph)	5	180	33	612	400	538	20	39	84	295	161	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	14	12	12	14	12	15	12	11	16	12
Storage Length (ft)	0		0	200		0	0		0	75		0
Storage Lanes	1		0	1		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor	0.95	1.00		0.99		0.92		0.99	0.98		1.00	
Frt		0.977				0.850			0.850		0.993	
Flt Protected	0.950			0.950				0.983		0.950	0.987	
Satd. Flow (prot)	1711	3441	0	1770	1863	1689	0	2014	1583	1625	1962	0
Flt Permitted	0.506			0.346				0.983		0.950	0.987	
Satd. Flow (perm)	869	3441	0	640	1863	1550	0	2001	1559	1625	1962	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18				522			100		3	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		362			1042			215			421	
Travel Time (s)		9.9			28.4			4.2			11.5	
Confl. Peds. (#/hr)	39		5	5		39	30					30
Confl. Bikes (#/hr)			1			5			3			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	200	37	680	444	598	22	43	93	328	179	13
Shared Lane Traffic (%)										22%		
Lane Group Flow (vph)	6	237	0	680	444	598	0	65	93	256	264	0
Turn Type	Perm	NA		pm+pt	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases		2		1	6	4	3	3	1	4	4	
Permitted Phases	2			6		6		3	3			
Detector Phase	2	2		1	6	4	3	3	1	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	33.1	33.1		12.1	31.1	42.0	13.6	13.6	12.1	42.0	42.0	
Total Split (s)	33.4	33.4		21.0	54.4	42.0	13.6	13.6	21.0	42.0	42.0	
Total Split (%)	30.4%	30.4%		19.1%	49.5%	38.2%	12.4%	12.4%	19.1%	38.2%	38.2%	
Maximum Green (s)	27.3	27.3		15.9	48.3	35.0	7.0	7.0	15.9	35.0	35.0	
Yellow Time (s)	3.7	3.7		3.0	3.7	3.1	3.3	3.3	3.0	3.1	3.1	
All-Red Time (s)	2.4	2.4		2.1	2.4	3.9	3.3	3.3	2.1	3.9	3.9	
Lost Time Adjust (s)	-0.7	-0.7		-0.1	-0.6	-1.7		-1.3	-0.1	-1.7	-1.7	
Total Lost Time (s)	5.4	5.4		5.0	5.5	5.3		5.3	5.0	5.3	5.3	
Lead/Lag	Lag	Lag		Lead		Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?						Yes				Yes	Yes	
Vehicle Extension (s)	3.0	3.0		1.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	
Recall Mode	C-Min	C-Min		None	C-Min	None	None	None	None	None	None	
Walk Time (s)	7.0	7.0			7.0	7.0				7.0	7.0	
Flash Dont Walk (s)	20.0	20.0			18.0	28.0				28.0	28.0	
Pedestrian Calls (#/hr)	0	0			0	0				0	0	
Act Effct Green (s)	13.1	13.1		64.5	64.0	87.6		9.2	53.8	23.4	23.4	
Actuated g/C Ratio	0.12	0.12		0.59	0.58	0.80		0.08	0.49	0.21	0.21	

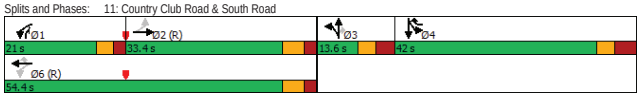
UNC DP TIA 2023 — Build (2030) AM
11: Country Club Road & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.06	0.56		0.80	0.41	0.44		0.39	0.11	0.74	0.63	
Control Delay	42.6	47.0		28.8	16.6	1.4		54.4	2.4	51.4	43.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	42.6	47.0		28.8	16.6	1.4		54.4	2.4	51.4	43.5	
LOS	D	D		C	B	A		D	A	D	D	
Approach Delay		46.9			16.2			23.8			47.4	
Approach LOS		D			B			C			D	
Queue Length 50th (ft)	4	78		327	171	7		45	0	178	177	
Queue Length 95th (ft)	16	115		#700	313	29		87	18	208	193	
Internal Link Dist (ft)		282			962			135			341	
Turn Bay Length (ft)				200						75		
Base Capacity (vph)	221	889		848	1084	1435		167	823	542	656	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.03	0.27		0.80	0.41	0.42		0.39	0.11	0.47	0.40	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 9 (8%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 25.6 — Intersection LOS: C
Intersection Capacity Utilization 95.1% — ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Country Club Road & South Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	339	0	59	0	195	0	481	291	0	0	0
Future Volume (vph)	94	339	0	59	0	195	0	481	291	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			4%			-4%			0%	
Storage Length (ft)	100		0	0		0	100		150	0		0
Storage Lanes	1		0	1		2	1		1	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.86			0.90		0.83			0.98			
Frt						0.850			0.850			
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1778	3557	0	1734	0	2731	0	3610	1615	0	0	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1535	3557	0	1555	0	2261	0	3610	1575	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	198					217			146			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		218			284			267			526	
Travel Time (s)		5.9			7.7			7.3			14.3	
Confl. Peds. (#/hr)	40		87	87		40	14		10	10		14
Confl. Bikes (#/hr)			15						6			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	104	377	0	66	0	217	0	534	323	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	104	377	0	66	0	217	0	534	323	0	0	0
Turn Type	Prot	NA		Prot		Perm		NA	pm+ov			
Protected Phases	7	4		3				2	3			
Permitted Phases						3		2	2			
Detector Phase	7	4		3		3		2	3			
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0		7.0		10.0	7.0			
Minimum Split (s)	11.9	25.6		12.9		12.9		30.0	12.9			
Total Split (s)	12.0	34.0		15.3		15.3		30.7	15.3			
Total Split (%)	15.0%	42.5%		19.1%		19.1%		38.4%	19.1%			
Maximum Green (s)	7.1	28.4		9.4		9.4		24.7	9.4			
Yellow Time (s)	3.0	3.2		3.0		3.0		3.4	3.0			
All-Red Time (s)	1.9	2.4		2.9		2.9		2.6	2.9			
Lost Time Adjust (s)	0.1	-0.6		-0.9		-0.9		-1.0	-0.9			
Total Lost Time (s)	5.0	5.0		5.0		5.0		5.0	5.0			
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	1.0	1.0		1.0		1.0		3.0	1.0			
Recall Mode	None	None		None		None		C-Min	None			
Walk Time (s)		4.0						4.0				
Flash Dont Walk (s)		16.0						20.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	6.9	14.3		8.6		8.6		42.2	50.7			
Actuated g/C Ratio	0.09	0.18		0.11		0.11		0.53	0.63			

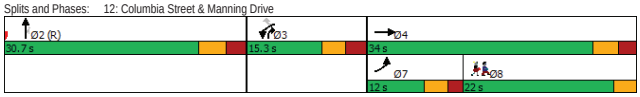
Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	28%
Maximum Green (s)	19.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.31	0.60		0.35		0.50		0.28	0.31			
Control Delay	2.4	34.0		31.1		7.6		11.6	3.6			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	2.4	34.0		31.1		7.6		11.6	3.6			
LOS	A	C		C		A		B	A			
Approach Delay		27.2			13.1			8.6				
Approach LOS		C			B			A				
Queue Length 50th (ft)	0	90		33		10		74	27			
Queue Length 95th (ft)	0	132		59		26		115	57			
Internal Link Dist (ft)		138			204			187			446	
Turn Bay Length (ft)	100								150			
Base Capacity (vph)	336	1289		224		481		1902	1089			
Starvation Cap Reductn	0	0		0		0		0	0			
Spillback Cap Reductn	0	0		0		0		0	0			
Storage Cap Reductn	0	0		0		0		0	0			
Reduced v/c Ratio	0.31	0.29		0.29		0.45		0.28	0.30			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 13 (16%), Referenced to phase 2:NBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 14.9 Intersection LOS: B
Intersection Capacity Utilization 54.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 12: Columbia Street & Manning Drive



Lane Group	Ø8
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — Build (2030) AM
13: West Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	267	362	110	179	245	226	14	12	7	8	9	16
Future Volume (vph)	267	362	110	179	245	226	14	12	7	8	9	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			3%			0%			-3%	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95			0.98			0.98			0.97	0.99
Frt		0.978			0.948			0.971				0.850
Flt Protected		0.982			0.986			0.979			0.977	
Satd. Flow (prot)	0	3327	0	0	3234	0	0	1738	0	0	1847	1607
Flt Permitted		0.599			0.606			0.851			0.831	
Satd. Flow (perm)	0	2029	0	0	1962	0	0	1510	0	0	1518	1587
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			208			8				100
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		388			334			349			293	
Travel Time (s)		7.6			6.5			9.5			8.0	
Confl. Peds. (#/hr)			107	107					66	66		
Confl. Bikes (#/hr)			7			2			1			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	297	402	122	199	272	251	16	13	8	9	10	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	821	0	0	722	0	0	37	0	0	19	18
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		4.0	4.0		7.0	7.0	7.0
Minimum Split (s)	20.4	20.4		11.9	23.9		26.7	26.7		28.5	28.5	28.5
Total Split (s)	39.5	39.5		11.9	51.4		28.6	28.6		28.6	28.6	28.6
Total Split (%)	49.4%	49.4%		14.9%	64.3%		35.8%	35.8%		35.8%	35.8%	35.8%
Maximum Green (s)	34.1	34.1		7.0	46.5		22.9	22.9		23.1	23.1	23.1
Yellow Time (s)	3.5	3.5		3.0	3.1		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	1.9	1.9		1.9	1.8		2.4	2.4		2.2	2.2	2.2
Lost Time Adjust (s)		-0.4			0.1			-0.7			-0.5	-0.5
Total Lost Time (s)		5.0			5.0			5.0			5.0	5.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		1.0	2.0		1.0	1.0		1.0	1.0	1.0
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	8.0	8.0			12.0		14.0	14.0		16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)		69.4			69.4			6.5			7.6	7.6
Actuated g/C Ratio		0.87			0.87			0.08			0.10	0.10
v/c Ratio		0.47			0.42			0.28			0.13	0.07
Control Delay		3.7			2.1			39.9			35.3	0.6
Queue Delay		0.0			0.0			0.0			0.0	0.0

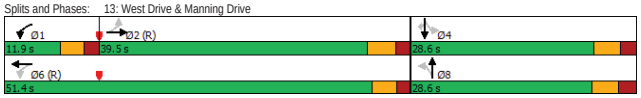
UNC DP TIA 2023 — Build (2030) AM
13: West Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		3.7			2.2			39.9			35.3	0.6
LOS		A			A			D			D	A
Approach Delay		3.7			2.2			39.9			18.4	
Approach LOS		A			A			D			B	
Queue Length 50th (ft)		139			5			12			9	0
Queue Length 95th (ft)		62			0			m39			29	0
Internal Link Dist (ft)		308			254			269			213	
Turn Bay Length (ft)												
Base Capacity (vph)		1763			1728			451			447	538
Starvation Cap Reductn		0			67			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.47			0.43			0.08			0.04	0.03

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 4 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 4.2 — Intersection LOS: A
Intersection Capacity Utilization 70.5% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: West Drive & Manning Drive



Build (2030) AM.syn — VHB

UNC DP TIA 2023 — Build (2030) AM
14: East Drive/Hospital Entrance & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	341	142	216	493	55	49	22	232	0	0	0
Future Volume (vph)	68	341	142	216	493	55	49	22	232	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		-4%			3%			-4%			0%	
Storage Length (ft)	150		0	100		0	100		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.96	0.94		0.93	0.99				0.90			
Frt		0.956			0.985				0.850			
Flt Protected	0.950			0.950				0.967				
Satd. Flow (prot)	1685	3030	0	1627	3166	0	0	1715	1507	0	0	0
Flt Permitted	0.415			0.440				0.967				
Satd. Flow (perm)	705	3030	0	698	3166	0	0	1715	1355	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		83			18				103			
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		382			469			315			391	
Travel Time (s)		7.4			9.1			8.6			10.7	
Confl. Peds. (#/hr)	88		85	85		88			83	83		
Confl. Bikes (#/hr)			6			1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	379	158	240	548	61	54	24	258	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	537	0	240	609	0	0	78	258	0	0	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov			
Protected Phases	5	2		1	6			8	1			
Permitted Phases	6			2			8		8			
Detector Phase	5	2		1	6		8	8	1			
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		7.0	7.0	5.0			
Minimum Split (s)	12.4	25.0		12.4	24.6		27.8	27.8	12.4			
Total Split (s)	13.0	30.0		22.0	39.0		28.0	28.0	22.0			
Total Split (%)	16.3%	37.5%		27.5%	48.8%		35.0%	35.0%	27.5%			
Maximum Green (s)	7.9	24.0		16.6	33.4		22.2	22.2	16.6			
Yellow Time (s)	3.0	3.4		3.0	3.1		3.4	3.4	3.0			
All-Red Time (s)	2.1	2.6		2.4	2.5		2.4	2.4	2.4			
Lost Time Adjust (s)	-0.4	-0.9		-0.4	-0.6			-1.2	-0.4			
Total Lost Time (s)	4.7	5.1		5.0	5.0			4.6	5.0			
Lead/Lag	Lead	Lag		Lead	Lag				Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	1.0	1.0			
Recall Mode	None	C-Min		None	C-Min		None	None	None			
Walk Time (s)		7.0			7.0		7.0	7.0				
Flash Dont Walk (s)		12.0			12.0		15.0	15.0				
Pedestrian Calls (#/hr)		0			0		0	0				
Act Effct Green (s)	60.3	47.1		58.7	56.5			9.2	18.8			

Build (2030) AM.syn — VHB

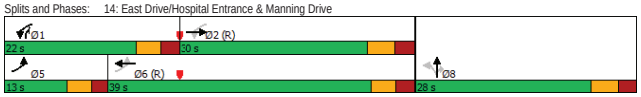
UNC DP TIA 2023 — Build (2030) AM
14: East Drive/Hospital Entrance & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.75	0.59		0.73	0.71			0.12	0.24			
v/c Ratio	0.13	0.30		0.37	0.27			0.40	0.62			
Control Delay	1.6	3.8		5.7	1.8			38.5	19.1			
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0			
Total Delay	1.6	3.8		5.7	1.8			38.5	19.1			
LOS	A	A		A	A			D	B			
Approach Delay		3.5			2.9			23.6				
Approach LOS		A			A			C				
Queue Length 50th (ft)	2	10		9	10			37	59			
Queue Length 95th (ft)	7	66		57	11			75	106			
Internal Link Dist (ft)		302			389			235			311	
Turn Bay Length (ft)	150			100								
Base Capacity (vph)	652	1818		741	2243			501	515			
Starvation Cap Reductn	0	0		0	0			0	0			
Spillback Cap Reductn	0	0		0	0			0	0			
Storage Cap Reductn	0	0		0	0			0	0			
Reduced v/c Ratio	0.12	0.30		0.32	0.27			0.16	0.50			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 13 (16%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 7.0 — Intersection LOS: A
Intersection Capacity Utilization 57.6% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 14: East Drive/Hospital Entrance & Manning Drive



Build (2030) AM.syn — VHB

UNC DP TIA 2023 — Build (2030) AM
15: Skipper Bowles Drive/Ridge Road & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	283	39	0	616	69	6	32	0	41	111	465
Future Volume (vph)	130	283	39	0	616	69	6	32	0	41	111	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	10	11	12	10	12	12	12	12	12
Grade (%)		-2%			6%			12%			2%	
Storage Length (ft)	100		0	100		0	0		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.94	0.98			0.98		0.85			0.88		0.82
Frt		0.982			0.985							0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1668	3337	0	1686	3210	0	1553	1751	0	1752	1844	1567
Flt Permitted	0.950						0.678			0.816		
Satd. Flow (perm)	1576	3337	0	1686	3210	0	947	1751	0	1331	1844	1284
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			13							144
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		348			791			579			293	
Travel Time (s)		9.5			21.6			15.8			8.0	
Confl. Peds. (#/hr)	99		124	124		99	155		113	113		155
Confl. Bikes (#/hr)			1						1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	144	314	43	0	684	77	7	36	0	46	123	517
Shared Lane Traffic (%)												
Lane Group Flow (vph)	144	357	0	0	761	0	7	36	0	46	123	517
Turn Type	Prot	NA		Prot	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases							4			8		4
Detector Phase	5	2		1	6		3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		4.0	7.0		7.0	7.0	7.0
Minimum Split (s)	12.9	35.2		12.8	37.0		8.0	34.3		13.0	33.0	12.9
Total Split (s)	15.0	39.9		12.8	37.7		8.0	34.3		13.0	39.3	15.0
Total Split (%)	15.0%	39.9%		12.8%	37.7%		8.0%	34.3%		13.0%	39.3%	15.0%
Maximum Green (s)	9.4	33.7		7.4	31.7		4.0	28.0		7.0	33.3	9.4
Yellow Time (s)	3.0	3.3		3.0	3.0		3.5	3.0		3.0	3.1	3.0
All-Red Time (s)	2.6	2.9		2.4	3.0		0.5	3.3		3.0	2.9	2.6
Lost Time Adjust (s)	-0.9	-1.3		-0.8	-1.1		-1.2	-1.2		-0.9	-0.9	-0.9
Total Lost Time (s)	4.7	4.9		4.6	4.9		2.8	5.1		5.1	5.1	4.7
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	2.0	3.0		2.0	2.0		3.0	2.0		2.0	2.0	2.0
Recall Mode	None	Min		None	Min		None	None		None	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			24.0			21.0			20.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	10.7	38.5			20.8		13.7	9.2		11.8	12.2	20.3

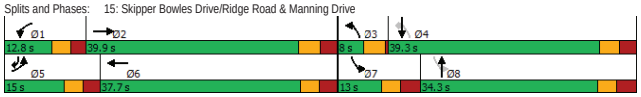
UNC DP TIA 2023 — Build (2030) AM
15: Skipper Bowles Drive/Ridge Road & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.19	0.68			0.37		0.24	0.16		0.21	0.22	0.36
v/c Ratio	0.46	0.16			0.64		0.02	0.13		0.13	0.31	0.85
Control Delay	32.4	5.8			19.0		18.0	28.9		20.1	24.7	27.8
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	32.4	5.8			19.0		18.0	28.9		20.1	24.7	27.8
LOS	C	A			B		B	C		C	C	C
Approach Delay		13.4			19.0			27.1			26.7	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	44	18			101		2	11		13	37	89
Queue Length 95th (ft)	#138	56			205		11	42		39	98	#258
Internal Link Dist (ft)		268			711			499			213	
Turn Bay Length (ft)	100											100
Base Capacity (vph)	336	2345			2033		291	1002		346	1199	625
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.43	0.15			0.37		0.02	0.04		0.13	0.10	0.83

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 56.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 20.4 — Intersection LOS: C
Intersection Capacity Utilization 76.2% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Skipper Bowles Drive/Ridge Road & Manning Drive



Build (2030) AM.syn — VHB

UNC DP TIA 2023 — Build (2030) AM
16: Columbia Street & Westwood Drive/Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	6	159	2	82	8	723	519	201	238	3
Future Volume (vph)	2	1	6	159	2	82	8	723	519	201	238	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-1%			-3%			-3%			4%	
Storage Length (ft)	0		0	0		250	150		200	0		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.94			0.95	0.92	0.90		0.95		1.00	
Frt		0.905				0.850			0.850		0.998	
Flt Protected		0.990			0.953		0.950			0.950		
Satd. Flow (prot)	0	1591	0	0	1742	1554	1796	1891	1714	1676	1757	0
Flt Permitted		0.990			0.953		0.587			0.125		
Satd. Flow (perm)	0	1577	0	0	1652	1437	997	1891	1623	221	1757	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				91			406		1	
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		283			749			309			956	
Travel Time (s)		6.4			20.4			8.4			26.1	
Confl. Peds. (#/hr)	21		16	16		21	32		10	10		32
Confl. Bikes (#/hr)			1						12			5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	1	7	177	2	91	9	803	577	223	264	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	179	91	9	803	577	223	267	0
Turn Type	Split	NA		Split	NA	pm+ov	D.Pm	NA	pm+ov	D.P+P	NA	
Protected Phases	4	4		3	3	1		2	3	1	6	
Permitted Phases						3	6		2	2		
Detector Phase	4	4		3	3	1	6	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	10.0	10.0	7.0	7.0	10.0	
Minimum Split (s)	28.3	28.3		33.4	33.4	11.9	16.9	30.9	33.4	11.9	16.9	
Total Split (s)	28.3	28.3		33.4	33.4	19.0	83.3	64.3	33.4	19.0	83.3	
Total Split (%)	19.5%	19.5%		23.0%	23.0%	13.1%	57.4%	44.3%	23.0%	13.1%	57.4%	
Maximum Green (s)	22.0	22.0		27.0	27.0	14.1	77.4	58.4	27.0	14.1	77.4	
Yellow Time (s)	3.3	3.3		3.5	3.5	3.1	3.6	3.6	3.5	3.1	3.6	
All-Red Time (s)	3.0	3.0		2.9	2.9	1.8	2.3	2.3	2.9	1.8	2.3	
Lost Time Adjust (s)		-1.3			-1.4	0.1	-0.9	-0.9	-1.4	0.1	-0.9	
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead		Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min	None	None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Flash Dont Walk (s)	18.0	18.0		23.0	23.0		7.0	21.0	23.0		7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	
Act Effct Green (s)		8.4			17.4	31.5	78.9	59.7	77.1	73.8	78.9	

Build (2030) AM.syn — VHB

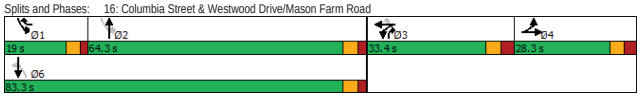
UNC DP TIA 2023 — Build (2030) AM
16: Columbia Street & Westwood Drive/Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.08			0.16	0.29	0.73	0.55	0.71	0.68	0.73	
v/c Ratio		0.08			0.64	0.18	0.01	0.77	0.45	0.66	0.21	
Control Delay		35.9			54.2	5.4	7.0	27.3	2.6	25.0	6.6	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		35.9			54.2	5.4	7.0	27.3	2.6	25.0	6.6	
LOS		D			D	A	A	C	A	C	A	
Approach Delay		35.9			37.7			16.9			15.0	
Approach LOS		D			D			B			B	
Queue Length 50th (ft)		2			114	0	1	392	24	48	47	
Queue Length 95th (ft)		22			208	30	10	#866	83	#210	139	
Internal Link Dist (ft)		203			669			229			876	
Turn Bay Length (ft)						250	150		200			
Base Capacity (vph)		349			458	496	724	1040	1420	339	1276	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.03			0.39	0.18	0.01	0.77	0.41	0.66	0.21	

Intersection Summary

Area Type: Other
Cycle Length: 145
Actuated Cycle Length: 108.6
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 19.2 — Intersection LOS: B
Intersection Capacity Utilization 80.8% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 16: Columbia Street & Westwood Drive/Mason Farm Road



Build (2030) AM.syn — VHB

UNC DP TIA 2023 — Build (2030) AM
17: West Drive & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	356	11	5	187	39	0	0	0	31	6	102
Future Volume (vph)	148	356	11	5	187	39	0	0	0	31	6	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			4%			0%			1%	
Storage Length (ft)	0		125	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96	0.60		0.96						0.90	
Frt			0.850		0.977						0.901	
Flt Protected		0.986			0.999						0.989	
Satd. Flow (prot)	0	1864	1607	0	1711	0	0	0	0	0	1535	0
Flt Permitted		0.822			0.990						0.989	
Satd. Flow (perm)	0	1489	968	0	1691	0	0	0	0	0	1482	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			35		23						113	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		344			481			500			293	
Travel Time (s)		9.4			13.1			11.4			8.0	
Confl. Peds. (#/hr)	87		125	125		87	39		75	78		39
Confl. Bikes (#/hr)			2			8						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	164	396	12	6	208	43	0	0	0	34	7	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	560	12	0	257	0	0	0	0	0	154	0
Turn Type	Perm	NA	Perm	Perm	NA					Perm	NA	
Protected Phases		2			6						4	
Permitted Phases	2		2	6						4		
Detector Phase	2	2	2	6	6					4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0					7.0	7.0	
Minimum Split (s)	23.0	23.0	23.0	23.8	23.8					25.6	25.6	
Total Split (s)	54.0	54.0	54.0	54.0	54.0					26.0	26.0	
Total Split (%)	67.5%	67.5%	67.5%	67.5%	67.5%					32.5%	32.5%	
Maximum Green (s)	49.0	49.0	49.0	48.2	48.2					20.4	20.4	
Yellow Time (s)	3.5	3.5	3.5	3.0	3.0					3.2	3.2	
All-Red Time (s)	1.5	1.5	1.5	2.8	2.8					2.4	2.4	
Lost Time Adjust (s)		0.0	0.0		-0.9						-0.2	
Total Lost Time (s)		5.0	5.0		4.9						5.4	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0					2.0	2.0	
Recall Mode	C-Min	C-Min	C-Min	Min	Min					None	None	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0					7.0	7.0	
Flash Dont Walk (s)	6.0	6.0	6.0	9.0	9.0					13.0	13.0	
Pedestrian Calls (#/hr)	0	0	0	0	0					0	0	
Act Effct Green (s)		60.7	60.7		60.8						8.9	
Actuated g/C Ratio		0.76	0.76		0.76						0.11	

UNC DP TIA 2023 — Build (2030) AM
17: West Drive & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.50	0.02		0.20						0.58	
Control Delay		5.9	0.4		3.1						13.1	
Queue Delay		0.0	0.0		0.0						0.0	
Total Delay		5.9	0.4		3.1						13.1	
LOS		A	A		A						B	
Approach Delay		5.8			3.1						13.1	
Approach LOS		A			A						B	
Queue Length 50th (ft)		73	0		22						10	
Queue Length 95th (ft)		180	1		57						57	
Internal Link Dist (ft)		264			401			420			213	
Turn Bay Length (ft)			125									
Base Capacity (vph)		1130	743		1291						465	
Starvation Cap Reductn		0	0		0						0	
Spillback Cap Reductn		0	0		0						0	
Storage Cap Reductn		0	0		0						0	
Reduced v/c Ratio		0.50	0.02		0.20						0.33	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 72 (90%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 6.3 — Intersection LOS: A
Intersection Capacity Utilization 70.5% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 17: West Drive & Mason Farm Road



UNC DP TIA 2023 — Build (2030) AM
18: Mason Farm Road & East Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	258	63	10	82	25	120	30	60	0	0	0
Future Volume (vph)	99	258	63	10	82	25	120	30	60	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	50		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90	0.95		0.89	0.97			0.94				
Frt		0.971			0.965			0.961				
Flt Protected	0.950			0.950				0.972				
Satd. Flow (prot)	1770	1719	0	1770	1745	0	0	1648	0	0	0	0
Flt Permitted	0.547			0.548				0.972				
Satd. Flow (perm)	920	1719	0	906	1745	0	0	1600	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			19			22				
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		481			155			560			76	
Travel Time (s)		13.1			4.2			15.3			1.7	
Confl. Peds. (#/hr)	63		133	133		63	23		30	30		23
Confl. Bikes (#/hr)			2						9			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	110	287	70	11	91	28	133	33	67	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	110	357	0	11	119	0	0	233	0	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA				
Protected Phases	5	2		1	6		8	8				
Permitted Phases	2			6								
Detector Phase	5	2		1	6		8	8				
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0				
Minimum Split (s)	29.1	29.3		29.8	19.3		24.3	24.3				
Total Split (s)	29.1	30.8		29.8	31.5		24.4	24.4				
Total Split (%)	34.2%	36.2%		35.1%	37.1%		28.7%	28.7%				
Maximum Green (s)	25.0	25.5		25.0	26.2		19.1	19.1				
Yellow Time (s)	3.0	3.2		3.0	3.2		3.0	3.0				
All-Red Time (s)	1.1	2.1		1.8	2.1		2.3	2.3				
Lost Time Adjust (s)	0.9	-0.2		0.4	-0.2			-0.4				
Total Lost Time (s)	5.0	5.1		5.2	5.1			4.9				
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	1.0				
Recall Mode	None	Min		None	Min		None	None				
Walk Time (s)	5.0	7.0		5.0	7.0		7.0	7.0				
Flash Dont Walk (s)	20.0	17.0		20.0	7.0		12.0	12.0				
Pedestrian Calls (#/hr)	0	0		0	0		0	0				
Act Effct Green (s)	21.4	20.4		18.4	13.4			10.3				
Actuated g/C Ratio	0.50	0.48		0.43	0.31			0.24				

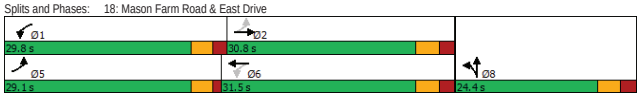
UNC DP TIA 2023 — Build (2030) AM
18: Mason Farm Road & East Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.19	0.43		0.02	0.21			0.57				
Control Delay	6.5	10.8		5.9	12.1			20.4				
Queue Delay	0.0	0.0		0.0	0.0			0.0				
Total Delay	6.5	10.8		5.9	12.1			20.4				
LOS	A	B		A	B			C				
Approach Delay		9.8			11.6			20.4				
Approach LOS		A			B			C				
Queue Length 50th (ft)	10	38		1	18			43				
Queue Length 95th (ft)	36	170		7	54			128				
Internal Link Dist (ft)		401			75			480			1	
Turn Bay Length (ft)	50			100								
Base Capacity (vph)	1084	1093		1104	1141			802				
Starvation Cap Reductn	0	0		0	0			0				
Spillback Cap Reductn	0	0		0	0			0				
Storage Cap Reductn	0	0		0	0			0				
Reduced v/c Ratio	0.10	0.33		0.01	0.10			0.29				

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 42.9
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 13.0 — Intersection LOS: B
Intersection Capacity Utilization 47.6% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 18: Mason Farm Road & East Drive



UNC DP TIA 2023 — Build (2030) AM
19: Mason Farm Road & Purefoy Road — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	141	34	11	232	49	1
Future Volume (vph)	141	34	11	232	49	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.974				0.998	
Flt Protected	0.961			0.998		
Satd. Flow (prot)	1744	0	0	1859	1859	0
Flt Permitted	0.961			0.998		
Satd. Flow (perm)	1744	0	0	1859	1859	0
Link Speed (mph)	25			30	30	
Link Distance (ft)	563			318	480	
Travel Time (s)	15.4			7.2	10.9	
Confl. Peds. (#/hr)	5	42	21			5
Confl. Bikes (#/hr)		13				9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	157	38	12	258	54	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	195	0	0	270	55	0
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		

UNC DP TIA 2023 — Build (2030) AM
19: Mason Farm Road & Purefoy Road — HCM 2010 AWSC

Intersection

Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	141	34	11	232	49	1
Future Vol, veh/h	141	34	11	232	49	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	157	38	12	258	54	1
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.4	9.8	8.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	5%	81%	0%
Vol Thru, %	95%	0%	98%
Vol Right, %	0%	19%	2%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	243	175	50
LT Vol	11	141	0
Through Vol	232	0	49
RT Vol	0	34	1
Lane Flow Rate	270	194	56
Geometry Grp	1	1	1
Degree of Util (X)	0.337	0.256	0.073
Departure Headway (Hd)	4.491	4.733	4.71
Convergence, Y/N	Yes	Yes	Yes
Cap	802	758	759
Service Time	2.517	2.763	2.744
HCM Lane V/C Ratio	0.337	0.256	0.074
HCM Control Delay	9.8	9.4	8.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.5	1	0.2

UNC DP TIA 2023 — Build (2030) AM
20: Skipper Bowles Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	341	26	365	589	1	33
Future Volume (vph)	341	26	365	589	1	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.989					0.850
Flt Protected				0.981	0.950	
Satd. Flow (prot)	3500	0	0	3472	1770	1583
Flt Permitted				0.981	0.950	
Satd. Flow (perm)	3500	0	0	3472	1770	1583
Link Speed (mph)	35			35	35	
Link Distance (ft)	336			902	340	
Travel Time (s)	6.5			17.6	6.6	
Confl. Peds. (#/hr)		7	7			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	379	29	406	654	1	37
Shared Lane Traffic (%)						
Lane Group Flow (vph)	408	0	0	1060	1	37
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

UNC DP TIA 2023 — Build (2030) AM
20: Skipper Bowles Drive & Manning Drive — HCM 2010 TWSC

Intersection

Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	341	26	365	589	1	33
Future Vol, veh/h	341	26	365	589	1	33
Conflicting Peds, #/hr	0	7	7	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	379	29	406	654	1	37

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	415	0	1540	211
Stage 1	-	-	-	-	401	-
Stage 2	-	-	-	-	1139	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1140	-	106	794
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	267	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1133	-	46	789
Mov Cap-2 Maneuver	-	-	-	-	46	-
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	117	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.5	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	46	789	-	-	1133	-
HCM Lane V/C Ratio	0.024	0.046	-	-	0.358	-
HCM Control Delay (s)	85.2	9.8	-	-	9.9	1.2
HCM Lane LOS	F	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	0.1	-	-	1.6	-

UNC DP TIA 2023 — Build (2030) AM
21: Columbia Street & Purefoy Road — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	23	5	1215	150	3	422
Future Volume (vph)	23	5	1215	150	3	422
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	250	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.975		0.985			
Flt Protected	0.961				0.950	
Satd. Flow (prot)	1745	0	1835	0	1770	1863
Flt Permitted	0.961				0.950	
Satd. Flow (perm)	1745	0	1835	0	1770	1863
Link Speed (mph)	25		25			25
Link Distance (ft)	654		109			397
Travel Time (s)	17.8		3.0			10.8
Confl. Peds. (#/hr)	8			3	3	
Confl. Bikes (#/hr)		2		3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	26	6	1350	167	3	469
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	0	1517	0	3	469
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 83.1%		ICU Level of Service E	
Analysis Period (min) 15			

UNC DP TIA 2023 — Build (2030) AM
21: Columbia Street & Purefoy Road — HCM 2010 TWSC

Intersection

Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	5	1215	150	3	422
Future Vol, veh/h	23	5	1215	150	3	422
Conflicting Peds, #/hr	8	0	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	6	1350	167	3	469

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1920	1437	0	0	1520	0
Stage 1	1437	-	-	-	-	-
Stage 2	483	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	74	163	-	-	439	-
Stage 1	219	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	73	163	-	-	438	-
Mov Cap-2 Maneuver	73	-	-	-	-	-
Stage 1	219	-	-	-	-	-
Stage 2	611	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	74.8	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	81	438	-
HCM Lane V/C Ratio	-	-	0.384	0.008	-
HCM Control Delay (s)	-	-	74.8	13.3	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	1.5	0	-

UNC DP TIA 2023 — Build (2030) AM
22: Columbia Street & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	570	3	68	179	1313	0	0	305	109
Future Volume (vph)	0	0	0	570	3	68	179	1313	0	0	305	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			2%			-2%	
Storage Length (ft)	0		0	600		600	250		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor				0.99	0.99		1.00					0.98
Frt						0.850						0.850
Flt Protected				0.950	0.953		0.950					
Satd. Flow (prot)	0	0	0	1656	1661	1560	1752	3504	0	0	3575	1599
Flt Permitted				0.950	0.953		0.542					
Satd. Flow (perm)	0	0	0	1639	1645	1560	995	3504	0	0	3575	1564
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						63						121
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1226			1188			609			378	
Travel Time (s)		33.4			32.4			16.6			10.3	
Confl. Peds. (#/hr)			5	5			2		7	7		2
Confl. Bikes (#/hr)									5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	633	3	76	199	1459	0	0	339	121
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	316	320	76	199	1459	0	0	339	121
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	7.0	10.0			10.0	10.0
Minimum Split (s)				29.8	29.8	29.8	13.8	28.1			16.1	16.1
Total Split (s)				59.0	59.0	59.0	18.0	101.0			83.0	83.0
Total Split (%)				36.9%	36.9%	36.9%	11.3%	63.1%			51.9%	51.9%
Maximum Green (s)				53.2	53.2	53.2	12.2	94.9			76.9	76.9
Yellow Time (s)				3.7	3.7	3.7	3.0	4.0			4.0	4.0
All-Red Time (s)				2.1	2.1	2.1	2.8	2.1			2.1	2.1
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				5.8	5.8	5.8	5.8	6.1			6.1	6.1
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				1.0	1.0	1.0	1.0	3.0			3.0	3.0
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0		7.0				
Flash Dont Walk (s)				17.0	17.0	17.0		15.0				
Pedestrian Calls (#/hr)				0	0	0		0				
Act Effct Green (s)				35.4	35.4	35.4	113.0	112.7			94.7	94.7
Actuated g/C Ratio				0.22	0.22	0.22	0.71	0.70			0.59	0.59

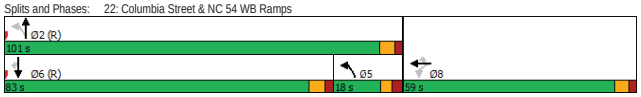
UNC DP TIA 2023 — Build (2030) AM
22: Columbia Street & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio				0.87	0.88	0.19	0.26	0.59			0.16	0.12
Control Delay				83.3	84.5	14.4	4.7	6.1			16.0	3.0
Queue Delay				0.0	0.0	0.0	0.0	0.2			0.0	0.0
Total Delay				83.3	84.5	14.4	4.7	6.3			16.0	3.0
LOS				F	F	B	A	A			B	A
Approach Delay					76.5			6.1			12.6	
Approach LOS					E			A			B	
Queue Length 50th (ft)				338	344	11	38	192			81	0
Queue Length 95th (ft)				431	436	53	62	380			126	33
Internal Link Dist (ft)		1146			1108			529			298	
Turn Bay Length (ft)				600		600	250					
Base Capacity (vph)				544	546	560	760	2468			2116	975
Starvation Cap Reductn				0	0	0	0	339			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.58	0.59	0.14	0.26	0.69			0.16	0.12

Intersection Summary

Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 29 (18%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 24.9		Intersection LOS: C	
Intersection Capacity Utilization 62.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 22: Columbia Street & NC 54 WB Ramps



UNC DP TIA 2023 — Build (2030) AM
23: Columbia Street & NC 54 EB Ramps/Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	406	3	344	0	0	0	0	1014	0	63	852	0
Future Volume (vph)	406	3	344	0	0	0	0	1014	0	63	852	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			0%			3%			-6%	
Storage Length (ft)	250		250	0		0	0		0	250		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99									
Frt			0.850									
Flt Protected	0.950	0.953								0.950		
Satd. Flow (prot)	1664	1670	1567	0	0	0	0	3486	0	1823	3645	0
Flt Permitted	0.950	0.953								0.181		
Satd. Flow (perm)	1664	1670	1546	0	0	0	0	3486	0	347	3645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			116									
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		975			270			219			609	
Travel Time (s)		22.2			6.1			6.0			16.6	
Confl. Peds. (#/hr)							9					9
Confl. Bikes (#/hr)			3						4			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	451	3	382	0	0	0	0	1127	0	70	947	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	225	229	382	0	0	0	0	1127	0	70	947	0
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	13.2	13.2	13.2					16.0		12.5	27.0	
Total Split (s)	63.0	63.0	63.0					83.0		14.0	97.0	
Total Split (%)	39.4%	39.4%	39.4%					51.9%		8.8%	60.6%	
Maximum Green (s)	56.8	56.8	56.8					77.0		8.5	91.0	
Yellow Time (s)	3.1	3.1	3.1					4.3		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.7		2.4	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2	6.2					6.0		5.5	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	2.0	2.0	2.0					3.0		1.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Walk Time (s)											7.0	
Flash Dont Walk (s)											14.0	
Pedestrian Calls (#/hr)											0	
Act Effct Green (s)	36.2	36.2	36.2					98.9		112.1	111.6	
Actuated g/C Ratio	0.23	0.23	0.23					0.62		0.70	0.70	

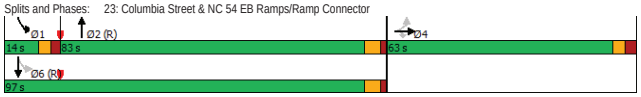
UNC DP TIA 2023 — Build (2030) AM
23: Columbia Street & NC 54 EB Ramps/Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.60	0.61	0.87					0.52		0.23	0.37	
Control Delay	60.5	60.8	60.2					5.4		4.9	3.7	
Queue Delay	0.0	0.0	0.0					0.3		0.0	0.3	
Total Delay	60.5	60.8	60.2					5.8		4.9	4.0	
LOS	E	E	E					A		A	A	
Approach Delay		60.4						5.8			4.0	
Approach LOS		E						A			A	
Queue Length 50th (ft)	223	228	282					111		8	62	
Queue Length 95th (ft)	285	289	374					m156		m15	73	
Internal Link Dist (ft)		895			190			139			529	
Turn Bay Length (ft)	250		250							250		
Base Capacity (vph)	590	592	623					2155		321	2542	
Starvation Cap Reductn	0	0	0					428		0	882	
Spillback Cap Reductn	0	0	0					2		0	0	
Storage Cap Reductn	0	0	0					0		0	0	
Reduced v/c Ratio	0.38	0.39	0.61					0.65		0.22	0.57	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 158 (99%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 20.5 — Intersection LOS: C
Intersection Capacity Utilization 62.1% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Columbia Street & NC 54 EB Ramps/Ramp Connector



UNC DP TIA 2023 — Build (2030) AM
24: Fordham Blvd & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2505	1433	95	0	26
Future Volume (vph)	0	2505	1433	95	0	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.991			0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3507	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	3507	0	0	1611
Link Speed (mph)		45	45		30	
Link Distance (ft)		1661	919		168	
Travel Time (s)		25.2	13.9		3.8	
Confl. Bikes (#/hr)				1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2783	1592	106	0	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2783	1698	0	0	29
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 72.6% — ICU Level of Service C
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
24: Fordham Blvd & Mason Farm Road — HCM 2010 TWSC

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2505	1433	95	0	26
Future Vol, veh/h	0	2505	1433	95	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2783	1592	106	0	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	849
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	304
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	304
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	18.1
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	304
HCM Lane V/C Ratio	-	-	-	0.095
HCM Control Delay (s)	-	-	-	18.1
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.3

UNC DP TIA 2023 — Build (2030) AM
25: Manning Drive & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	2256	4	10	1450	867	18	5	38	226	2	44
Future Volume (vph)	160	2256	4	10	1450	867	18	5	38	226	2	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			0%			0%			-4%	
Storage Length (ft)	350		0	150		900	0		75	500		400
Storage Lanes	2		0	1		1	0		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor		1.00		1.00				0.99	0.99			0.98
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950				0.963		0.950		
Satd. Flow (prot)	3519	3628	0	1770	3539	1583	0	1794	1583	3502	1900	1615
Flt Permitted	0.950			0.950				0.963		0.950		
Satd. Flow (perm)	3519	3628	0	1768	3539	1583	0	1778	1560	3502	1900	1577
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						479			95			133
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		455			1093			556			574	
Travel Time (s)		6.9			16.6			15.2			11.2	
Confl. Peds. (#/hr)			2	2			5					5
Confl. Bikes (#/hr)									1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	178	2507	4	11	1611	963	20	6	42	251	2	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	178	2511	0	11	1611	963	0	26	42	251	2	49
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6	4	3	3	1	4	4	
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	1	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.2	18.1		13.2	18.3	29.2	13.2	13.2	13.2	29.2	29.2	29.2
Total Split (s)	19.8	122.4		13.2	115.8	31.2	13.2	13.2	13.2	31.2	31.2	31.2
Total Split (%)	11.0%	68.0%		7.3%	64.3%	17.3%	7.3%	7.3%	7.3%	17.3%	17.3%	17.3%
Maximum Green (s)	13.6	116.3		7.0	109.5	25.0	7.0	7.0	7.0	25.0	25.0	25.0
Yellow Time (s)	3.0	4.7		3.0	4.5	3.8	3.8	3.8	3.0	3.8	3.8	3.8
All-Red Time (s)	3.2	1.4		3.2	1.8	2.4	2.4	2.4	3.2	2.4	2.4	2.4
Lost Time Adjust (s)	-1.2	-1.1		-1.2	-1.3	-1.2		-1.2	-1.2	-1.2	-1.2	-1.2
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			
Vehicle Extension (s)	1.0	6.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	3.0		1.0	3.0	3.0	2.0	2.0	1.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	20.0		0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	60.0		0.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min		None	Min	None	None	None	None	None	None	None
Walk Time (s)						7.0				7.0	7.0	7.0
Flash Dont Walk (s)						16.0				16.0	16.0	16.0

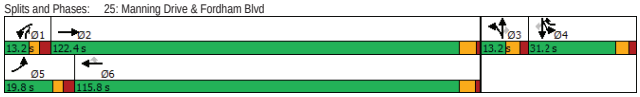
UNC DP TIA 2023 — Build (2030) AM
25: Manning Drive & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)						0				0	0	0
Act Effct Green (s)	12.4	118.6		8.3	111.3	132.2		8.3	12.9	18.6	18.6	18.6
Actuated g/C Ratio	0.08	0.72		0.05	0.67	0.80		0.05	0.08	0.11	0.11	0.11
v/c Ratio	0.67	0.96		0.12	0.67	0.71		0.29	0.20	0.63	0.01	0.17
Control Delay	89.3	34.7		84.4	20.0	5.4		89.7	2.1	78.2	66.5	1.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	34.7		84.4	20.0	5.4		89.7	2.1	78.2	66.5	1.2
LOS	F	C		F	C	A		F	A	E	E	A
Approach Delay		38.3			14.8			35.6			65.6	
Approach LOS		D			B			D			E	
Queue Length 50th (ft)	103	~1594		12	599	100		29	0	142	2	0
Queue Length 95th (ft)	152	#1813		38	768	179		69	0	193	11	0
Internal Link Dist (ft)		375			1013			476			494	
Turn Bay Length (ft)	350			150		900			75	500		400
Base Capacity (vph)	318	2609		88	2424	1416		90	210	562	304	364
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.56	0.96		0.13	0.66	0.68		0.29	0.20	0.45	0.01	0.13

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 164.9
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 29.0 — Intersection LOS: C
Intersection Capacity Utilization 90.8% — ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 25: Manning Drive & Fordham Blvd



UNC DP TIA 2023 — Build (2030) AM
26: Oteys Road & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	21	11	2	100	19	86	1	1	3	3	22
Future Volume (vph)	48	21	11	2	100	19	86	1	1	3	3	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	10	10	12	10	12	10	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.982			0.979			0.999			0.892	
Flt Protected		0.971			0.999			0.953			0.995	
Satd. Flow (prot)	0	1658	0	0	1700	0	0	1773	0	0	1653	0
Flt Permitted		0.971			0.999			0.953			0.995	
Satd. Flow (perm)	0	1658	0	0	1700	0	0	1773	0	0	1653	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1056			735			360			503	
Travel Time (s)		28.8			20.0			9.8			13.7	
Confl. Peds. (#/hr)	22		1	1		22			3	3		
Confl. Bikes (#/hr)			1			4						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	53	23	12	2	111	21	96	1	1	3	3	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	88	0	0	134	0	0	98	0	0	30	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 29.6% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
26: Oteys Road & Mason Farm Road — HCM 2010 AWSC

Intersection

Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	21	11	2	100	19	86	1	1	3	3	22
Future Vol, veh/h	48	21	11	2	100	19	86	1	1	3	3	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	53	23	12	2	111	21	96	1	1	3	3	24
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	8.1	8.3	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	98%	60%	2%	11%
Vol Thru, %	1%	26%	83%	11%
Vol Right, %	1%	14%	16%	79%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	88	80	121	28
LT Vol	86	48	2	3
Through Vol	1	21	100	3
RT Vol	1	11	19	22
Lane Flow Rate	98	89	134	31
Geometry Grp	1	1	1	1
Degree of Util (X)	0.126	0.109	0.158	0.035
Departure Headway (Hd)	4.655	4.416	4.244	4.098
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	772	814	848	875
Service Time	2.669	2.428	2.254	2.115
HCM Lane V/C Ratio	0.127	0.109	0.158	0.035
HCM Control Delay	8.3	8	8.1	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.4	0.6	0.1

UNC DP TIA 2023 — Build (2030) AM
27: Boundary Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	300	13	57	623	74	3	19	18	43	20	8
Future Volume (vph)	11	300	13	57	623	74	3	19	18	43	20	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	12	11	11	12
Grade (%)		-3%			1%			2%			-1%	
Storage Length (ft)	0		0	0		0	50		0	75		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.99	0.99		1.00	0.99	
Frt		0.994			0.985			0.927			0.956	
Flt Protected		0.998			0.996		0.950			0.950		
Satd. Flow (prot)	0	3564	0	0	3443	0	1694	1642	0	1754	1751	0
Flt Permitted		0.928			0.901		0.784			0.784		
Satd. Flow (perm)	0	3313	0	0	3115	0	1380	1642	0	1446	1751	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			28			20			9	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1100			226			551			371	
Travel Time (s)		30.0			6.2			15.0			10.1	
Confl. Peds. (#/hr)	7					7	17		1	1		17
Confl. Bikes (#/hr)						6			1			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	12	333	14	63	692	82	3	21	20	48	22	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	359	0	0	837	0	3	41	0	48	31	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.4	15.4		15.6	15.6		12.6	12.6		24.7	24.7	
Total Split (s)	25.3	25.3		25.3	25.3		24.7	24.7		24.7	24.7	
Total Split (%)	50.6%	50.6%		50.6%	50.6%		49.4%	49.4%		49.4%	49.4%	
Maximum Green (s)	19.9	19.9		19.7	19.7		19.1	19.1		19.0	19.0	
Yellow Time (s)	3.7	3.7		3.5	3.5		3.7	3.7		3.9	3.9	
All-Red Time (s)	1.7	1.7		2.1	2.1		1.9	1.9		1.8	1.8	
Lost Time Adjust (s)		-0.4			-0.6		-0.6	-0.6		-0.7	-0.7	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		1.0	1.0		1.0	1.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										12.0	12.0	
Pedestrian Calls (#/hr)										0	0	

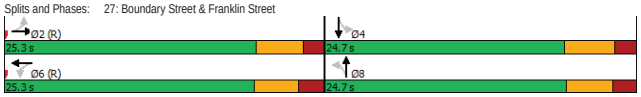
UNC DP TIA 2023 — Build (2030) AM
27: Boundary Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		39.2			39.2		7.9	7.9		7.9	7.9	
Actuated g/C Ratio		0.78			0.78		0.16	0.16		0.16	0.16	
v/c Ratio		0.14			0.34		0.01	0.15		0.21	0.11	
Control Delay		1.4			3.7		17.7	13.7		20.7	15.6	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		1.4			3.7		17.7	13.7		20.7	15.6	
LOS		A			A		B	B		C	B	
Approach Delay		1.4			3.7			14.0			18.7	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)		10			46		1	5		13	6	
Queue Length 95th (ft)		13			77		6	25		35	23	
Internal Link Dist (ft)		1020			146			471			291	
Turn Bay Length (ft)							50			75		
Base Capacity (vph)		2598			2447		543	659		569	695	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.14			0.34		0.01	0.06		0.08	0.04	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 31 (62%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.34
Intersection Signal Delay: 4.3 — Intersection LOS: A
Intersection Capacity Utilization 54.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 27: Boundary Street & Franklin Street



UNC DP TIA 2023 — Build (2030) AM
28: Park Place & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	357	2	113	751	0	35
Future Volume (vph)	357	2	113	751	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	9	12
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.865	
Flt Protected				0.993		
Satd. Flow (prot)	3536	0	0	3514	1450	0
Flt Permitted				0.993		
Satd. Flow (perm)	3536	0	0	3514	1450	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	461			1129	375	
Travel Time (s)	12.6			30.8	10.2	
Confl. Peds. (#/hr)		9	9		2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	397	2	126	834	0	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	399	0	0	960	39	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 48.2% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
28: Park Place & Franklin Street — HCM 2010 TWSC

Intersection
Int Delay, s/veh 1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	357	2	113	751	0	35
Future Vol, veh/h	357	2	113	751	0	35
Conflicting Peds, #/hr	0	9	9	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	397	2	126	834	0	39

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	408	0	1078	209
Stage 1	-	-	-	-	407	-
Stage 2	-	-	-	-	671	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1147	-	213	797
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	470	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1141	-	168	793
Mov Cap-2 Maneuver	-	-	-	-	168	-
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	373	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	793	-	-	1141	-
HCM Lane V/C Ratio	0.049	-	-	0.11	-
HCM Control Delay (s)	9.8	-	-	8.5	0.7
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.4	-

UNC DP TIA 2023 — Build (2030) AM
29: Battle Lane & Boundary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	45	127	0	0	67	62	0	57	14
Future Volume (vph)	0	0	0	45	127	0	0	67	62	0	57	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt								0.935			0.973	
Flt Protected					0.987							
Satd. Flow (prot)	0	0	0	0	1839	0	0	1742	0	0	1812	0
Flt Permitted					0.987							
Satd. Flow (perm)	0	0	0	0	1839	0	0	1742	0	0	1812	0
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		92			498			70			394	
Travel Time (s)		2.1			13.6			1.9			10.7	
Confl. Peds. (#/hr)			15			9	1		23	23		1
Confl. Bikes (#/hr)												3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	50	141	0	0	74	69	0	63	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	191	0	0	143	0	0	79	0
Sign Control		Stop			Stop			Yield			Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 33.5% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
30: Country Club Road & Battle Lane — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	71	333	426	105	102	0
Future Volume (vph)	71	333	426	105	102	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.973			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1812	0	1770	0
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1812	0	1770	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		90	508		70	
Travel Time (s)		2.5	13.9		1.9	
Confl. Peds. (#/hr)	9			23		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	370	473	117	113	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	79	370	590	0	113	0
Sign Control		Free	Free		Yield	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 48.8% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
31: Country Club Road & Paul Green Theater Drive/Gimghoul Road — Lanes, Volumes, Timings

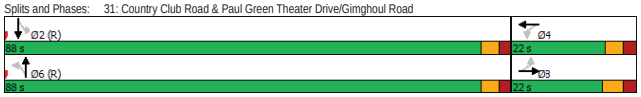
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	10	6	1	6	59	592	4	8	417	25
Future Volume (vph)	2	0	10	6	1	6	59	592	4	8	417	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			2%			1%			1%	
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95			0.97		0.96	1.00			0.99	
Frt		0.886			0.937			0.999			0.992	
Flt Protected		0.992			0.977		0.950				0.999	
Satd. Flow (prot)	0	1604	0	0	1654	0	1761	1851	0	0	1823	0
Flt Permitted		0.942			0.845		0.480				0.989	
Satd. Flow (perm)	0	1518	0	0	1409	0	851	1851	0	0	1805	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			7			1			8	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		153			324			421			824	
Travel Time (s)		4.2			8.8			11.5			22.5	
Confl. Peds. (#/hr)	5		9	9		5	18		4	4		18
Confl. Bikes (#/hr)						1			1			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	0	11	7	1	7	66	658	4	9	463	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	0	0	15	0	66	662	0	0	500	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2	2	
Detector Phase	8	8		4	4		6	6		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	21.0	21.0		18.6	18.6		15.1	15.1		15.1	15.1	
Total Split (s)	22.0	22.0		22.0	22.0		88.0	88.0		88.0	88.0	
Total Split (%)	20.0%	20.0%		20.0%	20.0%		80.0%	80.0%		80.0%	80.0%	
Maximum Green (s)	16.0	16.0		16.4	16.4		82.9	82.9		82.9	82.9	
Yellow Time (s)	3.5	3.5		3.1	3.1		3.1	3.1		3.1	3.1	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-0.6		-0.1	-0.1			-0.1	
Total Lost Time (s)		5.0			5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	11.0	11.0		9.0	9.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		8.0			7.8		102.8	102.8			102.8	
Actuated g/C Ratio		0.07			0.07		0.93	0.93			0.93	

UNC DP TIA 2023 — Build (2030) AM
31: Country Club Road & Paul Green Theater Drive/Gimghoul Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.10			0.14		0.08	0.38			0.30	
Control Delay		14.4			37.9		1.2	1.9			1.5	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		14.4			37.9		1.2	1.9			1.5	
LOS		B			D		A	A			A	
Approach Delay		14.4			37.9			1.8			1.5	
Approach LOS		B			D			A			A	
Queue Length 50th (ft)		0			5		0	0			0	
Queue Length 95th (ft)		14			27		11	137			81	
Internal Link Dist (ft)		73			244			341			744	
Turn Bay Length (ft)							50					
Base Capacity (vph)		252			223		795	1730			1687	
Starvation Cap Reductn		0			0		0	107			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.05			0.07		0.08	0.41			0.30	

Intersection Summary
Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 4 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.38
Intersection Signal Delay: 2.3 — Intersection LOS: A
Intersection Capacity Utilization 54.6% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 31: Country Club Road & Paul Green Theater Drive/Gimghoul Road



UNC DP TIA 2023 — Build (2030) AM
32: Hibbard Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	545	17	13	705	34	4	17	12	36	10	46
Future Volume (vph)	50	545	17	13	705	34	4	17	12	36	10	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			2%			-5%			-2%	
Storage Length (ft)	150		0	75		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.89	0.98		0.74	0.98			0.90			0.80	
Frt		0.995			0.993			0.951			0.932	
Flt Protected	0.950			0.950				0.994			0.981	
Satd. Flow (prot)	1778	3473	0	1752	3399	0	0	1669	0	0	1491	0
Flt Permitted	0.316			0.415				0.966			0.856	
Satd. Flow (perm)	526	3473	0	570	3399	0	0	1582	0	0	1205	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			7			13			51	
Link Speed (mph)		25			25			25			20	
Link Distance (ft)		469			330			188			294	
Travel Time (s)		12.8			9.0			5.1			10.0	
Confl. Peds. (#/hr)	208		340	340		208	249		190	190		249
Confl. Bikes (#/hr)			1						6			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	56	606	19	14	783	38	4	19	13	40	11	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	625	0	14	821	0	0	36	0	0	102	0
Turn Type	D.P+P	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.3	18.5		22.5	22.5		29.3	29.3		29.3	29.3	
Total Split (s)	13.0	50.0		37.0	37.0		30.0	30.0		30.0	30.0	
Total Split (%)	16.3%	62.5%		46.3%	46.3%		37.5%	37.5%		37.5%	37.5%	
Maximum Green (s)	7.7	44.5		31.5	31.5		23.7	23.7		23.7	23.7	
Yellow Time (s)	3.0	3.2		3.2	3.2		3.5	3.5		3.0	3.0	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.8	2.8		3.3	3.3	
Lost Time Adjust (s)	-0.1	-0.3		-0.4	-0.4			-1.3			-1.3	
Total Lost Time (s)	5.2	5.2		5.1	5.1			5.0			5.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		6.0		10.0	10.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	58.9	63.1		55.8	55.8			10.4			10.4	
Actuated g/C Ratio	0.74	0.79		0.70	0.70			0.13			0.13	

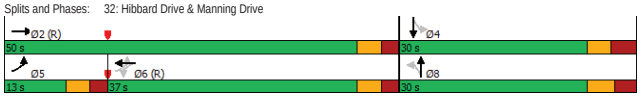
UNC DP TIA 2023 — Build (2030) AM
32: Hibbard Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.11	0.23		0.04	0.35			0.17			0.51	
Control Delay	3.5	2.5		3.4	4.4			23.1			26.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	3.5	2.5		3.4	4.4			23.1			26.7	
LOS	A	A		A	A			C			C	
Approach Delay		2.6			4.4			23.1			26.7	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	4	23		3	110			11			24	
Queue Length 95th (ft)	m15	57		m1	17			34			66	
Internal Link Dist (ft)		389			250			108			214	
Turn Bay Length (ft)	150			75								
Base Capacity (vph)	512	2739		397	2372			503			411	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.11	0.23		0.04	0.35			0.07			0.25	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 69 (86%), Referenced to phase 2:EBT and 6:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 5.4 — Intersection LOS: A
Intersection Capacity Utilization 58.7% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 32: Hibbard Drive & Manning Drive



UNC DP TIA 2023 — Build (2030) AM
33: Paul Harden Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	468	19	159	932	29	8	10	26	24	1	9
Future Volume (vph)	7	468	19	159	932	29	8	10	26	24	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	12	10	10	12
Grade (%)		-2%			2%			8%			-11%	
Storage Length (ft)	200		0	0		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		0.98	1.00		0.85	0.90		0.88	0.86	
Frt		0.994			0.996			0.891			0.864	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3542	0	1752	3480	0	1586	1334	0	1742	1356	0
Flt Permitted	0.244			0.446			0.750			0.731		
Satd. Flow (perm)	455	3542	0	803	3480	0	1067	1334	0	1174	1356	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			5			29			10	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		433			267			379			301	
Travel Time (s)		11.8			7.3			10.3			8.2	
Confl. Peds. (#/hr)	31		26	26		31	150		126	126		150
Confl. Bikes (#/hr)			1						2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	520	21	177	1036	32	9	11	29	27	1	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	541	0	177	1068	0	9	40	0	27	11	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.9	23.1		11.9	22.1		28.8	28.8		30.3	30.3	
Total Split (s)	12.0	34.7		14.9	37.6		30.4	30.4		30.4	30.4	
Total Split (%)	15.0%	43.4%		18.6%	47.0%		38.0%	38.0%		38.0%	38.0%	
Maximum Green (s)	7.1	29.6		10.0	32.5		24.6	24.6		24.1	24.1	
Yellow Time (s)	3.0	3.3		3.0	3.3		3.0	3.0		3.5	3.5	
All-Red Time (s)	1.9	1.8		1.9	1.8		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.2	-0.1		0.1	0.1		-0.4	-0.4		-0.9	-0.9	
Total Lost Time (s)	5.1	5.0		5.0	5.2		5.4	5.4		5.4	5.4	
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			10.0		16.0	16.0		17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	68.8	53.6		61.5	66.0		8.3	8.3		8.5	8.5	

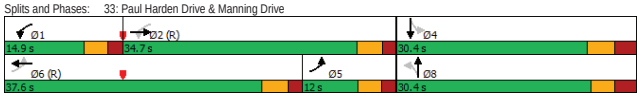
UNC DP TIA 2023 — Build (2030) AM
33: Paul Harden Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.86	0.67		0.77	0.82		0.10	0.10		0.11	0.11	
v/c Ratio	0.02	0.23		0.25	0.37		0.08	0.25		0.22	0.07	
Control Delay	1.7	6.4		3.2	4.5		33.5	20.0		36.9	19.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	1.7	6.4		3.2	4.5		33.5	20.0		36.9	19.6	
LOS	A	A		A	A		C	C		D	B	
Approach Delay		6.4			4.3			22.5			31.9	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	1	56		17	70		4	5		13	0	
Queue Length 95th (ft)	m3	98		36	197		17	33		36	15	
Internal Link Dist (ft)		353			187			299			221	
Turn Bay Length (ft)	200						75			100		
Base Capacity (vph)	506	2373		754	2870		333	436		366	430	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.02	0.23		0.23	0.37		0.03	0.09		0.07	0.03	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 66 (83%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.37
Intersection Signal Delay: 5.9 — Intersection LOS: A
Intersection Capacity Utilization 65.6% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 33: Paul Harden Drive & Manning Drive



UNC DP TIA 2023 — Build (2030) AM
34: East Drive & Dogwood Deck Entrance/Jackson Circle — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	1	0	1	18	323	4	58	101	214
Future Volume (vph)	0	0	0	1	0	1	18	323	4	58	101	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	12	12	10	12	12
Storage Length (ft)	0		0	0		0	100		0	75		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998			0.898	
Flt Protected					0.976		0.950			0.950		
Satd. Flow (prot)	0	0	0	0	1694	0	1652	1859	0	1652	1673	0
Flt Permitted					0.976		0.950			0.950		
Satd. Flow (perm)	0	0	0	0	1694	0	1652	1859	0	1652	1673	0
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		321			259			210			315	
Travel Time (s)		7.3			7.1			5.7			8.6	
Confl. Peds. (#/hr)	19					19	4		1	1		4
Confl. Bikes (#/hr)									2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1	0	1	20	359	4	64	112	238
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2	0	20	363	0	64	350	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 40.1% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
34: East Drive & Dogwood Deck Entrance/Jackson Circle — HCM 2010 TWSC

Intersection
Int Delay, s/veh 0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	0	1	18	323	4	58	101	214
Future Vol, veh/h	0	0	0	1	0	1	18	323	4	58	101	214
Conflicting Peds, #/hr	19	0	0	0	0	19	4	0	1	1	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	3801088		-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	1	0	1	20	359	4	64	112	238

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	761	884	381	354	0	0	364	0	0
Stage 1	402	402	-	-	-	-	-	-	-
Stage 2	359	482	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	373	284	666	1205	-	-	1195	-	-
Stage 1	676	600	-	-	-	-	-	-	-
Stage 2	707	553	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	347	0	655	1205	-	-	1194	-	-
Mov Cap-2 Maneuver	347	0	-	-	-	-	-	-	-
Stage 1	664	0	-	-	-	-	-	-	-
Stage 2	669	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0.4	1.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBRWBLn1	SBL	SBT	SBR
Capacity (veh/h)	1205	-	- 454	1194	-	-
HCM Lane V/C Ratio	0.017	-	- 0.005	0.054	-	-
HCM Control Delay (s)	8	-	- 13	8.2	-	-
HCM Lane LOS	A	-	- B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	- 0	0.2	-	-

UNC DP TIA 2023 — Build (2030) AM
35: East Drive & Dogwood Deck Exit — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	172	96	0	188	62	0
Future Volume (vph)	172	96	0	188	62	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1770	1583	0	1863	1863	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	1583	0	1863	1863	0
Link Speed (mph)	30			25	30	
Link Distance (ft)	134			176	210	
Travel Time (s)	3.0			4.8	4.8	
Confl. Peds. (#/hr)	8	1	6			6
Confl. Bikes (#/hr)						8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	191	107	0	209	69	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	191	107	0	209	69	0
Sign Control	Stop			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 26.2% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
35: East Drive & Dogwood Deck Exit — HCM 2010 TWSC

Intersection
Int Delay, s/veh 5.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	172	96	0	188	62	0
Future Vol, veh/h	172	96	0	188	62	0
Conflicting Peds, #/hr	8	1	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	191	107	0	209	69	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	286	70	-	0	-	0
Stage 1	69	-	-	-	-	-
Stage 2	217	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	704	993	0	-	-	0
Stage 1	954	-	0	-	-	0
Stage 2	819	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	704	992	-	-	-	-
Mov Cap-2 Maneuver	704	-	-	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	819	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	704	992	-
HCM Lane V/C Ratio	-	0.271	0.108	-
HCM Control Delay (s)	-	12	9.1	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	1.1	0.4	-

UNC DP TIA 2023 — Build (2030) AM
36: Mason Farm Road & Hibbard Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	36	12	1	148	104	53	4	2	23	4	25
Future Volume (vph)	37	36	12	1	148	104	53	4	2	23	4	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.944			0.996			0.935	
Flt Protected		0.979						0.957			0.978	
Satd. Flow (prot)	0	1729	0	0	1700	0	0	1657	0	0	1590	0
Flt Permitted		0.979						0.957			0.978	
Satd. Flow (perm)	0	1729	0	0	1700	0	0	1657	0	0	1590	0
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		221			213			480			560	
Travel Time (s)		6.0			5.8			10.9			15.3	
Confl. Peds. (#/hr)	3		4	4		3	29		59	59		29
Confl. Bikes (#/hr)									20			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	41	40	13	1	164	116	59	4	2	26	4	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	94	0	0	281	0	0	65	0	0	58	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 42.5%		ICU Level of Service A	
Analysis Period (min) 15			

UNC DP TIA 2023 — Build (2030) AM
36: Mason Farm Road & Hibbard Drive — HCM 2010 TWSC

Intersection

Int Delay, s/veh	12.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	36	12	1	148	104	53	4	2	23	4	25
Future Vol, veh/h	37	36	12	1	148	104	53	4	2	23	4	25
Conflicting Peds, #/hr	3	0	4	4	0	3	29	0	59	59	0	29
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	40	13	1	164	116	59	4	2	26	4	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	365	282	51	283	295	67	61	0	0	65	0	0
Stage 1	99	99	-	182	182	-	-	-	-	-	-	-
Stage 2	266	183	-	101	113	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	591	627	1017	669	616	997	1542	-	-	1537	-	-
Stage 1	907	813	-	820	749	-	-	-	-	-	-	-
Stage 2	739	748	-	905	802	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	372	552	992	569	543	950	1508	-	-	1468	-	-
Mov Cap-2 Maneuver	372	552	-	569	543	-	-	-	-	-	-	-
Stage 1	853	780	-	753	688	-	-	-	-	-	-	-
Stage 2	474	687	-	829	770	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.3	14.5	6.7	3.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1508	-	-	481	659	1468	-	-
HCM Lane V/C Ratio	0.039	-	-	0.196	0.427	0.017	-	-
HCM Control Delay (s)	7.5	0	-	14.3	14.5	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	2.1	0.1	-	-

UNC DP TIA 2023 — Build (2030) AM
37: Bell Tower Drive & South Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	310	143	147	317	50	95
Future Volume (vph)	310	143	147	317	50	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	50		0	100
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.83		0.83		0.40	0.48
Frt	0.957					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1486	0	1770	1863	1770	1583
Flt Permitted			0.406		0.950	
Satd. Flow (perm)	1486	0	628	1863	699	762
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	40					106
Link Speed (mph)	25			25	30	
Link Distance (ft)	696			744	512	
Travel Time (s)	19.0			20.3	11.6	
Confl. Peds. (#/hr)		217	217		410	211
Confl. Bikes (#/hr)		24				4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	344	159	163	352	56	106
Shared Lane Traffic (%)						
Lane Group Flow (vph)	503	0	163	352	56	106
Turn Type	NA		D.P+P	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			2		8	8
Detector Phase	2		1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	7.0	7.0
Minimum Split (s)	22.4		12.4	15.4	22.5	22.5
Total Split (s)	48.3		12.5	60.8	24.2	24.2
Total Split (%)	56.8%		14.7%	71.5%	28.5%	28.5%
Maximum Green (s)	42.9		7.1	55.4	19.1	19.1
Yellow Time (s)	3.3		3.0	3.3	3.4	3.4
All-Red Time (s)	2.1		2.4	2.1	1.7	1.7
Lost Time Adjust (s)	-0.5		-0.4	-0.4	-0.1	-0.1
Total Lost Time (s)	4.9		5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?			Yes			
Vehicle Extension (s)	3.0		1.0	3.0	2.0	2.0
Recall Mode	C-Min		None	Min	None	None
Walk Time (s)	7.0				7.0	7.0
Flash Dont Walk (s)	10.0				10.0	10.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	53.1		60.5	66.5	11.9	11.9
Actuated g/C Ratio	0.62		0.71	0.78	0.14	0.14
v/c Ratio	0.53		0.30	0.24	0.58	0.54

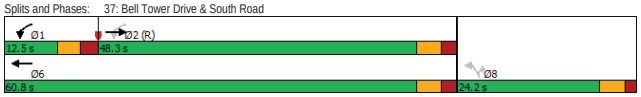
UNC DP TIA 2023 — Build (2030) AM
37: Bell Tower Drive & South Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	12.8		4.3	3.3	55.5	17.0
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	12.8		4.3	3.3	55.5	17.0
LOS	B		A	A	E	B
Approach Delay	12.8			3.6	30.3	
Approach LOS	B			A	C	
Queue Length 50th (ft)	132		16	37	29	0
Queue Length 95th (ft)	280		32	64	62	44
Internal Link Dist (ft)	616			664	432	
Turn Bay Length (ft)			50			100
Base Capacity (vph)	942		550	1458	157	254
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.53		0.30	0.24	0.36	0.42

Intersection Summary

Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 53 (62%), Referenced to phase 2:EBWB, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 62.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 37: Bell Tower Drive & South Road



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	396	539	0	157	103
Future Volume (vph)	0	396	539	0	157	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					0.96	0.96
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3539	3539	0	1770	1583
Flt Permitted					0.950	
Satd. Flow (perm)	0	3539	3539	0	1708	1518
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						92
Link Speed (mph)		35	35		20	
Link Distance (ft)		334	382		292	
Travel Time (s)		6.5	7.4		10.0	
Confl. Peds. (#/hr)	109			109	38	32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	440	599	0	174	114
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	440	599	0	174	114
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		10.0	10.0		7.0	7.0
Minimum Split (s)		14.7	19.4		31.1	31.1
Total Split (s)		40.0	40.0		40.0	40.0
Total Split (%)		50.0%	50.0%		50.0%	50.0%
Maximum Green (s)		35.3	35.6		34.9	34.9
Yellow Time (s)		3.3	3.0		3.0	3.0
All-Red Time (s)		1.4	1.4		2.1	2.1
Lost Time Adjust (s)		0.3	0.6		-0.1	-0.1
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		2.0	2.0		2.0	2.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		19.0	19.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		57.5	57.5		12.5	12.5
Actuated g/C Ratio		0.72	0.72		0.16	0.16
v/c Ratio		0.17	0.24		0.63	0.36
Control Delay		2.0	1.6		41.1	12.5
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		2.0	1.6		41.1	12.5
LOS		A	A		D	B

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Approach Delay		2.0	1.6		29.8	
Approach LOS		A	A		C	
Queue Length 50th (ft)		7	1		83	10
Queue Length 95th (ft)		35	18		134	49
Internal Link Dist (ft)		254	302		212	
Turn Bay Length (ft)						
Base Capacity (vph)		2542	2542		774	715
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.17	0.24		0.22	0.16

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 34 (43%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 7.9 Intersection LOS: A
Intersection Capacity Utilization 40.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 38: Manning Drive & Hospital Exit



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	445	135	183	729	10	21
Future Volume (vph)	445	135	183	729	10	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.965					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3415	0	1770	3539	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3415	0	1770	3539	1770	1583
Link Speed (mph)	25			25	15	
Link Distance (ft)	330			433	367	
Travel Time (s)	9.0			11.8	16.7	
Confl. Peds. (#/hr)		17	17		19	
Confl. Bikes (#/hr)		9				1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	494	150	203	810	11	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	644	0	203	810	11	23
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 40.5% ICU Level of Service A
Analysis Period (min) 15

Intersection

Int Delay, s/veh 1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	445	135	183	729	10	21
Future Vol, veh/h	445	135	183	729	10	21
Conflicting Peds, #/hr	0	17	17	0	19	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	494	150	203	810	11	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	661	0	1416	339
Stage 1	-	-	-	-	586	-
Stage 2	-	-	-	-	830	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	923	-	128	657
Stage 1	-	-	-	-	519	-
Stage 2	-	-	-	-	388	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	910	-	97	648
Mov Cap-2 Maneuver	-	-	-	-	97	-
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	297	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	22.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	97	648	-	-	910	-
HCM Lane V/C Ratio	0.115	0.036	-	-	0.223	-
HCM Control Delay (s)	46.9	10.8	-	-	10.1	-
HCM Lane LOS	E	B	-	-	B	-
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.9	-

UNC DP TIA 2023 — Build (2030) AM
101: US 15/501 & Estes Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	3	219	10	2	5	262	1318	5	2	1436	85
Future Volume (vph)	119	3	219	10	2	5	262	1318	5	2	1436	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		0	150		0	250		0	220		225
Storage Lanes	0		2	0		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.98			0.99							
Frt			0.850		0.957			0.999				0.850
Flt Protected		0.953			0.972		0.950			0.950		
Satd. Flow (prot)	0	1758	2760	0	1695	0	3400	3501	0	1752	3505	1568
Flt Permitted		0.953			0.972		0.950			0.950		
Satd. Flow (perm)	0	1716	2760	0	1695	0	3400	3501	0	1752	3505	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			243		6			1				126
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		1824			872			1606			1920	
Travel Time (s)		41.5			19.8			24.3			29.1	
Confl. Peds. (#/hr)	7					7						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	132	3	243	11	2	6	291	1464	6	2	1596	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	135	243	0	19	0	291	1470	0	2	1596	94
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	3	3	5	4	4		5	2		1	6	3
Permitted Phases			3									6
Detector Phase	3	3	5	4	4		5	2		1	6	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.6	13.6	13.7	13.7	13.7		13.7	18.1		13.5	18.1	13.6
Total Split (s)	14.2	14.2	15.0	13.7	13.7		15.0	48.6		13.5	47.1	14.2
Total Split (%)	15.8%	15.8%	16.7%	15.2%	15.2%		16.7%	54.0%		15.0%	52.3%	15.8%
Maximum Green (s)	7.6	7.6	8.3	7.0	7.0		8.3	42.5		7.0	41.0	7.6
Yellow Time (s)	3.8	3.8	3.0	3.2	3.2		3.0	4.4		3.0	4.6	3.8
All-Red Time (s)	2.8	2.8	3.7	3.5	3.5		3.7	1.7		3.5	1.5	2.8
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.6	6.7		6.7		6.7	6.1		6.5	6.1	6.6
Lead/Lag	Lag	Lag	Lead	Lead	Lead		Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	3.0	1.0	1.0		3.0	6.0		3.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)		9.8	27.4		7.0		11.0	59.4		7.0	44.4	57.6
Actuated g/C Ratio		0.11	0.30		0.08		0.12	0.66		0.08	0.49	0.64

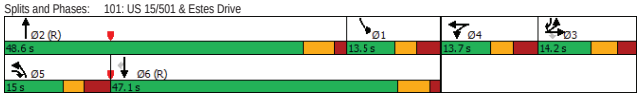
UNC DP TIA 2023 — Build (2030) AM
101: US 15/501 & Estes Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.71	0.24		0.14		0.70	0.64		0.01	0.92	0.09
Control Delay		62.2	4.4		33.1		49.7	13.1		42.5	30.5	1.2
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		62.2	4.4		33.1		49.7	13.1		42.5	30.5	1.2
LOS		E	A		C		D	B		D	C	A
Approach Delay		25.1			33.1			19.2			28.9	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		72	0		7		79	182		1	472	0
Queue Length 95th (ft)		#186	31		29		#162	#509		m2	#820	m10
Internal Link Dist (ft)		1744			792			1526			1840	
Turn Bay Length (ft)							250			220		225
Base Capacity (vph)		190	1008		137		415	2309		136	1727	1048
Starvation Cap Reductn		0	0		0		0	0		0	0	0
Spillback Cap Reductn		0	0		0		0	0		0	0	0
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		0.71	0.24		0.14		0.70	0.64		0.01	0.92	0.09

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 19 (21%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 24.1 — Intersection LOS: C
Intersection Capacity Utilization 73.5% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: US 15/501 & Estes Drive



UNC DP TIA 2023 — Build (2030) AM
102: US 15/501 & Willow Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	14	24	54	39	38	155	1310	36	28	1547	263
Future Volume (vph)	65	14	24	54	39	38	155	1310	36	28	1547	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	220		0	220		260
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.98		0.98	0.99			1.00				0.97
Frt		0.906			0.926			0.996				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1635	0	1752	1694	0	1752	3489	0	1752	3505	1568
Flt Permitted	0.702			0.586			0.066			0.142		
Satd. Flow (perm)	1295	1635	0	1058	1694	0	122	3489	0	262	3505	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			23			3				167
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		1227			1197			1920			792	
Travel Time (s)		33.5			32.6			29.1			12.0	
Confl. Peds. (#/hr)			11	11			2					2
Confl. Bikes (#/hr)						3			1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	72	16	27	60	43	42	172	1456	40	31	1719	292
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	43	0	60	85	0	172	1496	0	31	1719	292
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	12.0
Minimum Split (s)	15.0	33.0		15.0	33.0		15.0	90.0		15.0	80.0	80.0
Total Split (s)	15.0	33.0		15.0	33.0		25.0	117.0		15.0	107.0	107.0
Total Split (%)	8.3%	18.3%		8.3%	18.3%		13.9%	65.0%		8.3%	59.4%	59.4%
Maximum Green (s)	8.7	26.6		9.1	26.6		18.9	110.9		9.4	100.9	100.9
Yellow Time (s)	3.0	3.9		3.0	3.9		3.0	4.6		3.0	4.6	4.6
All-Red Time (s)	3.3	2.5		2.9	2.5		3.1	1.5		2.6	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.4		5.9	6.4		6.1	6.1		5.6	6.1	6.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Walk Time (s)		4.0									5.0	5.0
Flash Dont Walk (s)		22.0									9.0	9.0
Pedestrian Calls (#/hr)		0									0	0
Act Effct Green (s)	18.6	11.6		21.7	11.4		141.4	131.4		125.4	117.9	117.9

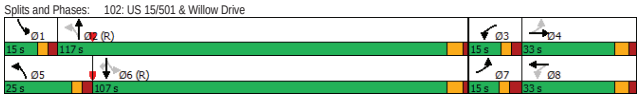
UNC DP TIA 2023 — Build (2030) AM
102: US 15/501 & Willow Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.10	0.06		0.12	0.06		0.79	0.73		0.70	0.66	0.66
v/c Ratio	0.46	0.33		0.35	0.66		0.68	0.59		0.13	0.75	0.28
Control Delay	78.6	43.6		72.4	83.0		37.1	14.7		4.8	14.2	2.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.4	0.0
Total Delay	78.6	43.6		72.4	83.0		37.1	14.7		4.8	14.6	2.6
LOS	E	D		E	F		D	B		A	B	A
Approach Delay		65.5			78.6			17.0			12.8	
Approach LOS		E			E			B			B	
Queue Length 50th (ft)	77	18		64	73		99	457		4	351	34
Queue Length 95th (ft)	128	62		110	136		197	527		m9	587	23
Internal Link Dist (ft)		1147			1117			1840			712	
Turn Bay Length (ft)	200						220			220		260
Base Capacity (vph)	158	264		172	269		281	2546		263	2295	1051
Starvation Cap Reductn	0	0		0	0		0	0		0	179	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.46	0.16		0.35	0.32		0.61	0.59		0.12	0.81	0.28

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 18.5 — Intersection LOS: B
Intersection Capacity Utilization 80.6% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: US 15/501 & Willow Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	29	35	151	95	55	146	106	1231	58	5	73	1469
Future Volume (vph)	29	35	151	95	55	146	106	1231	58	5	73	1469
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	525		150	350		150	350		175		225	
Storage Lanes	1		1	2		1	1		1		1	
Taper Length (ft)	25			25			25				25	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Ped Bike Factor												
Frt			0.850			0.850			0.850			
Flt Protected	0.950			0.950			0.950				0.950	
Satd. Flow (prot)	1752	1863	1568	3433	1863	1583	1752	3505	1583	0	1768	3505
Flt Permitted	0.950			0.950			0.096				0.156	
Satd. Flow (perm)	1752	1863	1568	3433	1863	1583	177	3505	1583	0	290	3505
Right Turn on Red			Yes			Yes			Yes			
Satd. Flow (RTOR)			60			73			60			
Link Speed (mph)		30			30			45				45
Link Distance (ft)		828			950			792				1376
Travel Time (s)		18.8			21.6			12.0				20.8
Confl. Peds. (#/hr)							1					
Peak Hour Factor	0.90	0.92	0.90	0.92	0.92	0.92	0.90	0.90	0.92	0.90	0.92	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	103%	100%	100%
Heavy Vehicles (%)	3%	2%	3%	2%	2%	2%	3%	3%	2%	3%	2%	3%
Adj. Flow (vph)	32	38	168	103	60	159	118	1368	63	6	79	1632
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	38	168	103	60	159	118	1368	63	0	85	1632
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	7	4	5	3	8	1!	5	2	3	1!	1	6
Permitted Phases			4			8	6		2	2	2	
Detector Phase	7	4	5	3	8	1	5	2	3	1	1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	12.0
Minimum Split (s)	13.4	43.5	13.3	13.6	40.5	13.4	13.3	42.5	13.6	13.4	13.4	36.5
Total Split (s)	13.9	43.5	20.0	14.0	43.6	15.9	20.0	106.6	14.0	15.9	15.9	102.5
Total Split (%)	7.7%	24.2%	11.1%	7.8%	24.2%	8.8%	11.1%	59.2%	7.8%	8.8%	8.8%	56.9%
Maximum Green (s)	7.5	37.0	13.7	7.4	37.1	9.5	13.7	100.1	7.4	9.5	9.5	96.0
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.5	3.0	3.0	3.0	4.5
All-Red Time (s)	3.4	2.7	3.3	3.6	2.7	3.4	3.3	2.0	3.6	3.4	3.4	2.0
Lost Time Adjust (s)	-1.4	-1.5	-1.3	-1.6	-1.5	-1.4	-1.3	-1.5	-1.6		-1.4	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes			Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	45.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	None	C-Min
Walk Time (s)		7.0			7.0			7.0				7.0
Flash Dont Walk (s)		30.0			27.0			29.0				23.0

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	30
Future Volume (vph)	30
Ideal Flow (vphpl)	1900
Storage Length (ft)	100
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Ped Bike Factor	0.98
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1568
Flt Permitted	
Satd. Flow (perm)	1532
Right Turn on Red	Yes
Satd. Flow (RTOR)	60
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	0.90
Growth Factor	100%
Heavy Vehicles (%)	3%
Adj. Flow (vph)	33
Shared Lane Traffic (%)	
Lane Group Flow (vph)	33
Turn Type	pm+ov
Protected Phases	7
Permitted Phases	6
Detector Phase	7
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	13.4
Total Split (s)	13.9
Total Split (%)	7.7%
Maximum Green (s)	7.5
Yellow Time (s)	3.0
All-Red Time (s)	3.4
Lost Time Adjust (s)	-1.4
Total Lost Time (s)	5.0
Lead/Lag	Lead
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Minimum Gap (s)	2.0
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	None
Walk Time (s)	
Flash Dont Walk (s)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Pedestrian Calls (#/hr)		0			0			0				0
Act Effct Green (s)	9.8	10.3	27.7	11.5	12.0	25.7	140.9	132.2	148.7		140.9	125.7
Actuated g/C Ratio	0.05	0.06	0.15	0.06	0.07	0.14	0.78	0.73	0.83		0.78	0.70
v/c Ratio	0.34	0.36	0.58	0.47	0.48	0.55	0.44	0.53	0.05		0.29	0.67
Control Delay	91.1	90.3	50.8	87.9	93.2	45.3	26.6	5.2	0.1		4.4	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0		0.0	0.0
Total Delay	91.1	90.3	50.8	87.9	93.2	45.3	26.6	5.3	0.1		4.4	8.9
LOS	F	F	D	F	F	D	C	A	A		A	A
Approach Delay		62.5			67.9			6.7				8.5
Approach LOS		E			E			A				A
Queue Length 50th (ft)	37	44	118	61	70	95	19	171	1		15	303
Queue Length 95th (ft)	78	87	193	95	122	176	92	70	m1		m16	209
Internal Link Dist (ft)		748			870			712				1296
Turn Bay Length (ft)	525		150	350		150	350		175		225	
Base Capacity (vph)	97	398	304	221	399	307	284	2574	1319		320	2448
Starvation Cap Reductn	0	0	0	0	0	0	0	207	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0		0	34
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.33	0.10	0.55	0.47	0.15	0.52	0.42	0.58	0.05		0.27	0.68

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 19 (11%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 16.1 Intersection LOS: B
Intersection Capacity Utilization 71.4% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 103: US 15/501 & Elliott Road



Lane Group	SBR
Pedestrian Calls (#/hr)	
Act Effct Green (s)	135.5
Actuated g/C Ratio	0.75
v/c Ratio	0.03
Control Delay	0.4
Queue Delay	0.0
Total Delay	0.4
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	m1
Internal Link Dist (ft)	
Turn Bay Length (ft)	100
Base Capacity (vph)	1171
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.03

Intersection Summary

UNC DP TIA 2023 — Build (2030) AM
104: US 15/501 & Eastgate/Ephesus Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	24	85	190	50	13	100	1075	138	35	1220	11
Future Volume (vph)	51	24	85	190	50	13	100	1075	138	35	1220	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	260		200	220		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	0.99	0.99			0.99		1.00				1.00	
Frt		0.883			0.970				0.850		0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1609	0	3400	1780	0	1752	3505	1568	1752	3501	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1730	1609	0	3400	1780	0	1751	3505	1568	1752	3501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		84			7				226		1	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		448			1242			1376			811	
Travel Time (s)		12.2			33.9			20.8			12.3	
Confl. Peds. (#/hr)	8					8	1					1
Confl. Bikes (#/hr)			3			2						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	57	27	94	211	56	14	111	1194	153	39	1356	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	121	0	211	70	0	111	1194	153	39	1368	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Free	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									Free			
Detector Phase	3	8		7	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	20.0	36.9		33.8	37.7		20.0	80.0		18.0	68.0	
Total Split (s)	20.0	37.0		33.9	50.9		23.0	91.1		18.0	86.1	
Total Split (%)	11.1%	20.6%		18.8%	28.3%		12.8%	50.6%		10.0%	47.8%	
Maximum Green (s)	13.6	30.1		27.1	44.2		16.2	84.3		11.3	79.4	
Yellow Time (s)	3.0	3.0		3.0	3.8		3.0	4.5		3.0	4.5	
All-Red Time (s)	3.4	3.9		3.8	2.9		3.8	2.3		3.7	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.9		6.8	6.7		6.8	6.8		6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.0	2.0		4.0	6.0		2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	60.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	

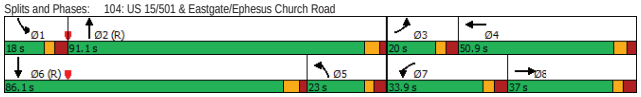
Build (2030) AM.syn — VHB

UNC DP TIA 2023 — Build (2030) AM
104: US 15/501 & Eastgate/Ephesus Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		23.0			24.0			17.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	10.3	10.7		16.5	20.2		16.2	119.4	180.0	8.9	109.4	
Actuated g/C Ratio	0.06	0.06		0.09	0.11		0.09	0.66	1.00	0.05	0.61	
v/c Ratio	0.58	0.69		0.68	0.34		0.71	0.51	0.10	0.45	0.64	
Control Delay	104.1	48.3		90.1	71.1		88.4	8.5	0.1	107.2	15.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	104.1	48.3		90.1	71.1		88.4	8.5	0.1	107.2	15.3	
LOS	F	D		F	E		F	A	A	F	B	
Approach Delay		66.2			85.4			13.7			17.8	
Approach LOS		E			F			B			B	
Queue Length 50th (ft)	67	43		126	71		133	204	0	46	334	
Queue Length 95th (ft)	121	116		171	124		#221	147	0	m74	401	
Internal Link Dist (ft)		368			1162			1296			731	
Turn Bay Length (ft)				200			260		200	220		
Base Capacity (vph)	132	339		511	442		157	2325	1568	111	2127	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.43	0.36		0.41	0.16		0.71	0.51	0.10	0.35	0.64	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 23 (13%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 24.3 — Intersection LOS: C
Intersection Capacity Utilization 72.0% — ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: US 15/501 & Eastgate/Ephesus Church Road



Build (2030) AM.syn — VHB

UNC DP TIA 2023 — Build (2030) AM
105: US 15/501 SB & Erwin Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Lane Configurations							
Traffic Volume (vph)	0	0	1963	302	0	509	
Future Volume (vph)	0	0	1963	302	0	509	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0			0	0	300	
Storage Lanes	0			1	0	1	
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.88	
Ped Bike Factor							
Frt				0.850		0.850	
Flt Protected							
Satd. Flow (prot)	0	0	5036	1568	0	2760	
Flt Permitted							
Satd. Flow (perm)	0	0	5036	1568	0	2760	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				93		21	
Link Speed (mph)		45	45		35		
Link Distance (ft)		777	779		938		
Travel Time (s)		11.8	11.8		18.3		
Confl. Peds. (#/hr)					4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	
Adj. Flow (vph)	0	0	2181	336	0	566	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	2181	336	0	566	
Turn Type			NA	Free		Prot	
Protected Phases			6			8	4
Permitted Phases				Free			
Detector Phase			6			8	
Switch Phase							
Minimum Initial (s)			12.0			7.0	7.0
Minimum Split (s)			117.0			27.4	15.0
Total Split (s)			125.0			55.0	55.0
Total Split (%)			69.4%			30.6%	31%
Maximum Green (s)			118.8			49.6	49.6
Yellow Time (s)			4.5			3.0	3.0
All-Red Time (s)			1.7			2.4	2.4
Lost Time Adjust (s)			0.0			0.0	
Total Lost Time (s)			6.2			5.4	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)			6.0			0.2	1.0
Minimum Gap (s)			2.0			2.0	2.0
Time Before Reduce (s)			15.0			0.0	0.0
Time To Reduce (s)			45.0			0.0	0.0
Recall Mode			C-Max			None	None
Walk Time (s)						7.0	
Flash Dont Walk (s)						15.0	

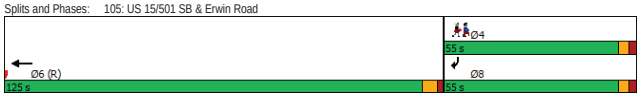
Build (2030) AM.syn — VHB

UNC DP TIA 2023 — Build (2030) AM
105: US 15/501 SB & Erwin Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Pedestrian Calls (#/hr)						0	
Act Effct Green (s)			129.4	180.0		39.0	
Actuated g/C Ratio			0.72	1.00		0.22	
v/c Ratio			0.60	0.21		0.92	
Control Delay			7.7	0.2		87.4	
Queue Delay			0.6	0.0		0.0	
Total Delay			8.2	0.2		87.4	
LOS			A	A		F	
Approach Delay			7.2		87.4		
Approach LOS			A		F		
Queue Length 50th (ft)			297	0		364	
Queue Length 95th (ft)			478	m0		424	
Internal Link Dist (ft)		697	699		858		
Turn Bay Length (ft)						300	
Base Capacity (vph)			3620	1568		775	
Starvation Cap Reductn			905	0		0	
Spillback Cap Reductn			0	0		0	
Storage Cap Reductn			0	0		0	
Reduced v/c Ratio			0.80	0.21		0.73	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 150 (83%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 21.9 — Intersection LOS: C
Intersection Capacity Utilization 65.8% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105: US 15/501 SB & Erwin Road



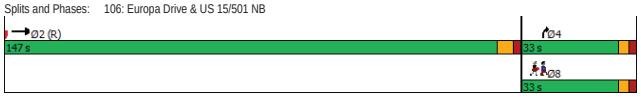
Build (2030) AM.syn — VHB

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations							
Traffic Volume (vph)	2007	104	0	0	0	153	
Future Volume (vph)	2007	104	0	0	0	153	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		250	0		0	0	
Storage Lanes		1	0		0	2	
Taper Length (ft)			25		25		
Lane Util. Factor	0.86	1.00	1.00	1.00	1.00	0.88	
Ped Bike Factor							
Frt		0.850				0.850	
Flt Protected							
Satd. Flow (prot)	6408	1583	0	0	0	2787	
Flt Permitted							
Satd. Flow (perm)	6408	1583	0	0	0	2787	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		39				39	
Link Speed (mph)	45			45	25		
Link Distance (ft)	764			605	662		
Travel Time (s)	11.6			9.2	18.1		
Confl. Peds. (#/hr)					4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	2230	116	0	0	0	170	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	2230	116	0	0	0	170	
Turn Type	NA	Free				Prot	
Protected Phases	2					4	8
Permitted Phases		Free					
Detector Phase	2					4	
Switch Phase							
Minimum Initial (s)	12.0					7.0	7.0
Minimum Split (s)	126.0					26.0	28.3
Total Split (s)	147.0					33.0	33.0
Total Split (%)	81.7%					18.3%	18%
Maximum Green (s)	140.2					27.7	27.7
Yellow Time (s)	4.5					3.0	3.0
All-Red Time (s)	2.3					2.3	2.3
Lost Time Adjust (s)	0.0					0.0	
Total Lost Time (s)	6.8					5.3	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	6.0					1.0	0.2
Minimum Gap (s)	2.0					2.0	2.0
Time Before Reduce (s)	15.0					0.0	0.0
Time To Reduce (s)	45.0					0.0	0.0
Recall Mode	C-Max					None	None
Walk Time (s)							7.0
Flash Dont Walk (s)							16.0
Pedestrian Calls (#/hr)							2
Act Effct Green (s)	154.7	180.0				13.2	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Actuated g/C Ratio	0.86	1.00				0.07	
v/c Ratio	0.41	0.07				0.71	
Control Delay	1.5	0.1				77.5	
Queue Delay	0.1	0.0				0.0	
Total Delay	1.6	0.1				77.5	
LOS	A	A				E	
Approach Delay	1.5				77.5		
Approach LOS	A				E		
Queue Length 50th (ft)	73	0				88	
Queue Length 95th (ft)	105	m0				129	
Internal Link Dist (ft)	684			525	582		
Turn Bay Length (ft)		250					
Base Capacity (vph)	5506	1583				461	
Starvation Cap Reductn	1609	0				0	
Spillback Cap Reductn	0	0				0	
Storage Cap Reductn	0	0				0	
Reduced v/c Ratio	0.57	0.07				0.37	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 48 (27%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 6.6 Intersection LOS: A
Intersection Capacity Utilization 45.0% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Europa Drive & US 15/501 NB

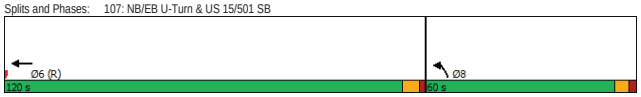


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1997	322	0
Future Volume (vph)	0	0	0	1997	322	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Right Turn on Red		Yes			Yes	Yes
Satd. Flow (RTOR)					16	
Link Speed (mph)	45			45	35	
Link Distance (ft)	779			295	205	
Travel Time (s)	11.8			4.5	4.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	2219	358	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	2219	358	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				12.0	7.0	
Minimum Split (s)				120.0	60.0	
Total Split (s)				120.0	60.0	
Total Split (%)				66.7%	33.3%	
Maximum Green (s)				113.3	53.5	
Yellow Time (s)				4.7	4.0	
All-Red Time (s)				2.0	2.5	
Lost Time Adjust (s)				0.0	0.0	
Total Lost Time (s)				6.7	6.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				6.0	5.0	
Minimum Gap (s)				2.0	2.0	
Time Before Reduce (s)				15.0	0.0	
Time To Reduce (s)				45.0	0.0	
Recall Mode				C-Max	None	
Act Effct Green (s)				141.3	25.5	
Actuated g/C Ratio				0.78	0.14	
v/c Ratio				0.80	0.72	
Control Delay				4.7	77.4	
Queue Delay				0.9	0.0	
Total Delay				5.6	77.4	
LOS				A	E	
Approach Delay				5.6	77.4	
Approach LOS				A	E	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Queue Length 50th (ft)				101	194	
Queue Length 95th (ft)				m122	236	
Internal Link Dist (ft)	699			215	125	
Turn Bay Length (ft)						
Base Capacity (vph)				2778	1031	
Starvation Cap Reductn				287	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.89	0.35	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 120 (67%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 15.6 Intersection LOS: B
Intersection Capacity Utilization 116.8% ICU Level of Service H
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: NB/EB U-Turn & US 15/501 SB



UNC DP TIA 2023 — Build (2030) AM
108: US 15/501 NB & SB/WB U-Turn — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2047	0	0	0	0	0	0	0	77	42	0
Future Volume (vph)	0	2047	0	0	0	0	0	0	0	77	42	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected										0.950		
Satd. Flow (prot)	0	3539	0	0	0	0	0	0	0	3433	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	3539	0	0	0	0	0	0	0	3433	1863	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										46		
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1186			764			262			186	
Travel Time (s)		18.0			11.6			6.0			3.6	
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.90	0.90	0.92	0.92	0.90	0.90	0.92	0.92	0.92	0.90	0.92	0.90
Adj. Flow (vph)	0	2274	0	0	0	0	0	0	0	86	46	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2274	0	0	0	0	0	0	0	86	46	0
Turn Type		NA								Split	NA	
Protected Phases		2								4	4	
Permitted Phases												
Detector Phase		2								4	4	
Switch Phase												
Minimum Initial (s)		12.0								7.0	7.0	
Minimum Split (s)		150.0								30.0	30.0	
Total Split (s)		150.0								30.0	30.0	
Total Split (%)		83.3%								16.7%	16.7%	
Maximum Green (s)		143.8								24.0	24.0	
Yellow Time (s)		4.7								4.0	4.0	
All-Red Time (s)		1.5								2.0	2.0	
Lost Time Adjust (s)		-1.2								-1.0	0.0	
Total Lost Time (s)		5.0								5.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0								1.0	1.0	
Minimum Gap (s)		2.0								2.0	2.0	
Time Before Reduce (s)		15.0								0.0	0.0	
Time To Reduce (s)		45.0								0.0	0.0	
Recall Mode		C-Max								None	None	
Act Effct Green (s)		160.4								9.6	8.6	
Actuated g/C Ratio		0.89								0.05	0.05	
v/c Ratio		0.72								0.38	0.52	
Control Delay		5.3								43.0	101.3	
Queue Delay		0.0								0.0	0.0	
Total Delay		5.3								43.0	101.3	
LOS		A								D	F	

UNC DP TIA 2023 — Build (2030) AM
108: US 15/501 NB & SB/WB U-Turn — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		5.3									63.3	
Approach LOS		A									E	
Queue Length 50th (ft)		68								18	52	
Queue Length 95th (ft)		92								m51	m89	
Internal Link Dist (ft)		1106			684			182			106	
Turn Bay Length (ft)												
Base Capacity (vph)		3154								516	248	
Starvation Cap Reductn		0								0	0	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.72								0.17	0.19	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 28 (16%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 8.5 — Intersection LOS: A
Intersection Capacity Utilization 131.2% — ICU Level of Service H
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 108: US 15/501 NB & SB/WB U-Turn



UNC DP TIA 2023 — Build (2030) AM
109: Old Durham-CH Road/Sage Road & US 15/501 — Lanes, Volumes, Timings

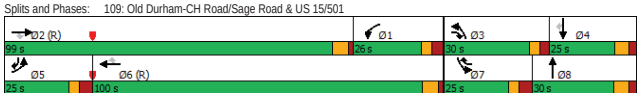
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	275	1334	114	99	1666	136	218	122	23	215	108	131
Future Volume (vph)	275	1334	114	99	1666	136	218	122	23	215	108	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	240		100	220		200	100		0	150		100
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor							1.00	1.00		1.00		0.99
Frt			0.850			0.850		0.976				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3505	1568	1752	3505	1568	1752	1795	0	3400	1845	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	3505	1568	1752	3505	1568	1746	1795	0	3386	1845	1545
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			81		4				95
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		829			1831			1573			1089	
Travel Time (s)		12.6			27.7			30.6			21.2	
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	306	1482	127	110	1851	151	242	136	26	239	120	146
Shared Lane Traffic (%)												
Lane Group Flow (vph)	306	1482	127	110	1851	151	242	162	0	239	120	146
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	25.0	89.0	25.0	20.0	65.0	25.0	25.0	25.0		25.0	25.0	25.0
Total Split (s)	25.0	99.0	30.0	26.0	100.0	25.0	30.0	30.0		25.0	25.0	25.0
Total Split (%)	13.9%	55.0%	16.7%	14.4%	55.6%	13.9%	16.7%	16.7%		13.9%	13.9%	13.9%
Maximum Green (s)	18.1	93.3	24.1	19.7	93.9	18.3	24.1	23.4		18.3	18.6	18.1
Yellow Time (s)	3.0	4.4	3.0	3.0	4.5	3.0	3.0	4.1		3.0	4.1	3.0
All-Red Time (s)	3.9	1.3	2.9	3.3	1.6	3.7	2.9	2.5		3.7	2.3	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.9	5.7	5.9	6.3	6.1	6.7	5.9	6.6		6.7	6.4	6.9
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	4.0	1.0	6.0	1.0	4.0	4.0		1.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	15.0	0.0	0.0	15.0	0.0	0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	45.0	0.0	0.0	45.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	18.3	97.1	121.0	19.7	97.6	119.2	24.1	22.3		15.6	14.8	32.5

UNC DP TIA 2023 — Build (2030) AM
109: Old Durham-CH Road/Sage Road & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.10	0.54	0.67	0.11	0.54	0.66	0.13	0.12		0.09	0.08	0.18
v/c Ratio	0.89	0.78	0.12	0.58	0.97	0.14	1.03	0.72		0.81	0.79	0.41
Control Delay	108.5	26.5	1.9	60.4	29.6	3.3	140.5	92.2		101.9	114.3	24.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	108.5	26.6	1.9	60.4	29.6	3.3	140.5	92.2		101.9	114.3	24.3
LOS	F	C	A	E	C	A	F	F		F	F	C
Approach Delay		38.0			29.4			121.1			82.4	
Approach LOS		D			C			F			F	
Queue Length 50th (ft)	178	758	6	125	~1148	39	~305	183		145	142	48
Queue Length 95th (ft)	#272	746	21	m150	#1321	m21	#496	271		195	217	119
Internal Link Dist (ft)		749			1751			1493			1009	
Turn Bay Length (ft)	240		100	220		200	100			150		100
Base Capacity (vph)	354	1890	1073	191	1899	1088	234	237		345	190	363
Starvation Cap Reductn	0	18	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.86	0.79	0.12	0.58	0.97	0.14	1.03	0.68		0.69	0.63	0.40

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 100 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 160
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 45.7 — Intersection LOS: D
Intersection Capacity Utilization 92.9% — ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 109: Old Durham-CH Road/Sage Road & US 15/501



UNC DP TIA 2023 — Build (2030) AM
110: BCBS/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

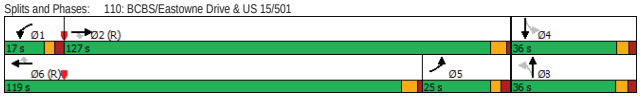
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	1464	11	41	1848	218	3	16	8	50	4	44
Future Volume (vph)	137	1464	11	41	1848	218	3	16	8	50	4	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220		100	220		250	100		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98	1.00				0.99	
Frt			0.850			0.850		0.950			0.861	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1752	0	1752	1568	0
Flt Permitted	0.950			0.950			0.722			0.740		
Satd. Flow (perm)	1752	3505	1568	1752	3505	1536	1330	1752	0	1365	1568	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			54			133		9			49	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		1831			1555			278			606	
Travel Time (s)		27.7			23.6			7.6			16.5	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	152	1627	12	46	2053	242	3	18	9	56	4	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	1627	12	46	2053	242	3	27	0	56	53	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	19.0	127.0	127.0	17.0	108.0	108.0	36.0	36.0		36.0	36.0	
Total Split (s)	25.0	127.0	127.0	17.0	119.0	119.0	36.0	36.0		36.0	36.0	
Total Split (%)	13.9%	70.6%	70.6%	9.4%	66.1%	66.1%	20.0%	20.0%		20.0%	20.0%	
Maximum Green (s)	19.2	121.3	121.3	11.2	113.1	113.1	29.9	29.9		30.1	30.1	
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.3	3.3		3.6	3.6	
All-Red Time (s)	2.8	1.1	1.1	2.8	1.3	1.3	2.8	2.8		2.3	2.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.8	5.7	5.7	5.8	5.9	5.9	6.1	6.1		5.9	5.9	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	6.0	1.0	6.0	6.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	50.0	50.0	0.0	50.0	50.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Walk Time (s)										7.0	7.0	

UNC DP TIA 2023 — Build (2030) AM
110: BCBS/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)										23.0	23.0	
Pedestrian Calls (#/hr)										2	2	
Act Effct Green (s)	19.2	141.4	141.4	8.7	128.1	128.1	14.9	14.9		15.1	15.1	
Actuated g/C Ratio	0.11	0.79	0.79	0.05	0.71	0.71	0.08	0.08		0.08	0.08	
v/c Ratio	0.82	0.59	0.01	0.55	0.82	0.21	0.03	0.18		0.49	0.30	
Control Delay	79.1	2.5	0.0	92.1	18.7	6.5	69.7	55.4		90.6	22.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	79.1	2.5	0.0	92.1	18.7	6.5	69.7	55.4		90.6	22.8	
LOS	E	A	A	F	B	A	E	E		F	C	
Approach Delay		9.0			18.9			56.8			57.6	
Approach LOS		A			B			E			E	
Queue Length 50th (ft)	182	21	0	54	488	35	3	20		65	5	
Queue Length 95th (ft)	m#253	192	m0	m68	771	m92	14	52		108	48	
Internal Link Dist (ft)		1751			1475			198			526	
Turn Bay Length (ft)	220		100	220		250	100					
Base Capacity (vph)	186	2753	1243	109	2494	1131	220	298		228	303	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.82	0.59	0.01	0.42	0.82	0.21	0.01	0.09		0.25	0.17	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 71 (39%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 16.0 — Intersection LOS: B
Intersection Capacity Utilization 83.3% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 110: BCBS/Eastowne Drive & US 15/501



UNC DP TIA 2023 — Build (2030) AM
111: Lakeview Drive/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

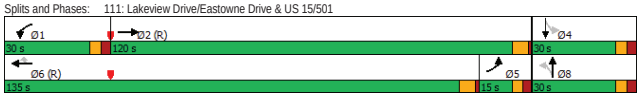
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	1517	3	90	2109	287	6	32	89	75	5	6
Future Volume (vph)	9	1517	3	90	2109	287	6	32	89	75	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		125	0		0	150		0	200		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850		0.890			0.919	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	5036	0	1752	3505	1568	1752	1642	0	1752	1695	0
Flt Permitted	0.950			0.950			0.749			0.439		
Satd. Flow (perm)	1752	5036	0	1752	3505	1568	1382	1642	0	810	1695	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						203		63			7	
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		1555			959			495			676	
Travel Time (s)		23.6			14.5			9.6			18.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	10	1686	3	100	2343	319	7	36	99	83	6	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1689	0	100	2343	319	7	135	0	83	13	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	92.0		30.0	80.0	80.0	30.0	30.0		30.0	30.0	
Total Split (s)	15.0	120.0		30.0	135.0	135.0	30.0	30.0		30.0	30.0	
Total Split (%)	8.3%	66.7%		16.7%	75.0%	75.0%	16.7%	16.7%		16.7%	16.7%	
Maximum Green (s)	9.4	114.5		24.2	129.5	129.5	23.8	23.8		23.9	23.9	
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	3.2	3.2		3.1	3.1	
All-Red Time (s)	2.6	1.0		2.8	1.0	1.0	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.5		5.8	5.5	5.5	6.2	6.2		6.1	6.1	
Lead/Lag	Lag	Lag		Lead	Lead	Lead						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0		1.0	6.0	6.0	1.0	1.0		2.0	2.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	45.0		0.0	45.0	45.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	8.0	129.2		13.7	142.7	142.7	19.6	19.6		19.7	19.7	
Actuated g/C Ratio	0.04	0.72		0.08	0.79	0.79	0.11	0.11		0.11	0.11	
v/c Ratio	0.13	0.47		0.75	0.84	0.25	0.05	0.58		0.94	0.07	
Control Delay	62.8	4.1		112.9	17.9	2.8	69.7	49.2		158.4	45.0	

UNC DP TIA 2023 — Build (2030) AM
111: Lakeview Drive/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	62.8	4.1		112.9	17.9	2.8	69.7	49.2		158.4	45.0	
LOS	E	A		F	B	A	E	D		F	D	
Approach Delay		4.4			19.6			50.3			143.0	
Approach LOS		A			B			D			F	
Queue Length 50th (ft)	12	168		118	706	24	7	80		98	6	
Queue Length 95th (ft)	m18	57		185	1287	73	24	157		#199	31	
Internal Link Dist (ft)		1475			879			415			596	
Turn Bay Length (ft)	150						150			200		
Base Capacity (vph)	91	3615		235	2779	1285	182	271		107	231	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.11	0.47		0.43	0.84	0.25	0.04	0.50		0.78	0.06	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 94 (52%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 17.6 — Intersection LOS: B
Intersection Capacity Utilization 96.6% — ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 111: Lakeview Drive/Eastowne Drive & US 15/501



UNC DP TIA 2023 — Build (2030) AM
201: Hamilton Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	1806	99	42	2329	28	140	26	59	61	34	27
Future Volume (vph)	27	1806	99	42	2329	28	140	26	59	61	34	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-4%			2%			-2%	
Storage Length (ft)	200		0	200		0	0		150	100		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.98		0.98	0.99	0.98	
Frt		0.992			0.998				0.850		0.934	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	4988	0	1805	5175	0	1752	1844	1567	1787	1731	0
Flt Permitted	0.045			0.051			0.713			0.738		
Satd. Flow (perm)	83	4988	0	97	5175	0	1288	1844	1536	1378	1731	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		10			2							
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		895			935			499			486	
Travel Time (s)		13.6			14.2			9.7			9.5	
Confl. Peds. (#/hr)	3		2	2		3	19		7	7		19
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	30	2007	110	47	2588	31	156	29	66	68	38	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	2117	0	47	2619	0	156	29	66	68	68	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	6			2			8		8	4		
Detector Phase	5	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	12.6	28.7		12.4	25.9		41.0	41.0	12.4	39.6	39.6	
Total Split (s)	12.8	76.3		12.7	76.2		41.0	41.0	12.7	41.0	41.0	
Total Split (%)	9.8%	58.7%		9.8%	58.6%		31.5%	31.5%	9.8%	31.5%	31.5%	
Maximum Green (s)	7.2	70.6		7.3	70.5		34.7	34.7	7.3	34.4	34.4	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.7	3.7	3.0	3.2	3.2	
All-Red Time (s)	2.6	1.7		2.4	1.7		2.6	2.6	2.4	3.4	3.4	
Lost Time Adjust (s)	-0.6	-0.6		-0.4	-0.9		-1.4	-1.4	-0.4	-1.5	-1.5	
Total Lost Time (s)	5.0	5.1		5.0	4.8		4.9	4.9	5.0	5.1	5.1	
Lead/Lag	Lead	Lead		Lag	Lag				Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		2.0	3.0		1.0	1.0	2.0	1.0	1.0	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		16.0			13.0		27.0	27.0		26.0	26.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	96.3	83.8		95.3	92.0		20.8	20.8	33.6	20.6	20.6	
Actuated g/C Ratio	0.74	0.64		0.73	0.71		0.16	0.16	0.26	0.16	0.16	
v/c Ratio	0.19	0.66		0.20	0.72		0.76	0.10	0.17	0.31	0.25	

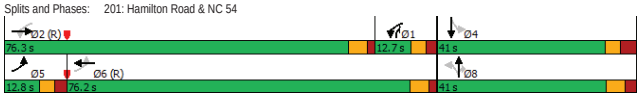
UNC DP TIA 2023 — Build (2030) AM
201: Hamilton Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	7.9	17.2		10.0	5.4		73.9	44.1	32.5	50.0	47.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	7.9	17.2		10.0	5.4		73.9	44.1	32.5	50.0	47.8	
LOS	A	B		A	A		E	D	C	D	D	
Approach Delay		17.0			5.5			59.6			48.9	
Approach LOS		B			A			E			D	
Queue Length 50th (ft)	5	472		4	88		127	21	37	51	51	
Queue Length 95th (ft)	17	483		m17	153		192	46	75	91	89	
Internal Link Dist (ft)		815			855			419			406	
Turn Bay Length (ft)	200			200					150	100		
Base Capacity (vph)	161	3217		242	3661		357	512	400	380	478	
Starvation Cap Reductn	0	0		0	15		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.19	0.66		0.19	0.72		0.44	0.06	0.17	0.18	0.14	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 56 (43%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 14.0 — Intersection LOS: B
Intersection Capacity Utilization 72.1% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 201: Hamilton Road & NC 54



UNC DP TIA 2023 — Build (2030) AM
202: Finley Golf Course Road/Burning Tree Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1850	48	197	2307	25	21	5	120	26	5	37
Future Volume (vph)	22	1850	48	197	2307	25	21	5	120	26	5	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	12	12	12	10	10	10
Storage Length (ft)	200		0	100		0	460		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99	0.99		0.99	
Frt		0.996			0.998				0.850		0.927	
Flt Protected	0.950			0.950				0.962			0.981	
Satd. Flow (prot)	1770	5062	0	1770	4904	0	0	1792	1583	0	1559	0
Flt Permitted	0.040			0.059				0.658			0.862	
Satd. Flow (perm)	75	5062	0	110	4904	0	0	1215	1563	0	1369	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			2				76		41	
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		651			853			632			471	
Travel Time (s)		9.9			12.9			12.3			9.2	
Confl. Peds. (#/hr)	3		2	2		3	12		1	1		12
Confl. Bikes (#/hr)												3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	24	2056	53	219	2563	28	23	6	133	29	6	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	2109	0	219	2591	0	0	29	133	0	76	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	6			2			8		8	4		
Detector Phase	5	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	12.9	31.2		12.9	29.2		47.2	47.2	12.9	45.3	45.3	
Total Split (s)	13.0	63.6		19.2	69.8		47.2	47.2	19.2	47.2	47.2	
Total Split (%)	10.0%	48.9%		14.8%	53.7%		36.3%	36.3%	14.8%	36.3%	36.3%	
Maximum Green (s)	7.1	57.4		13.3	63.6		41.0	41.0	13.3	40.9	40.9	
Yellow Time (s)	3.0	4.9		3.0	4.9		3.7	3.7	3.0	3.2	3.2	
All-Red Time (s)	2.9	1.3		2.9	1.3		2.5	2.5	2.9	3.1	3.1	
Lost Time Adjust (s)	-0.9	-1.2		-0.9	-1.2			-1.2	-0.9		-1.3	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lead		Lag	Lag				Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0	2.0	2.0	2.0	
Minimum Gap (s)	0.2	3.0		0.2	3.0		0.2	0.2	0.2	0.2	0.2	
Time Before Reduce (s)	0.0	20.0		0.0	20.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	40.0		0.0	40.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		7.0			7.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		18.0			16.0		34.0	34.0		32.0	32.0	

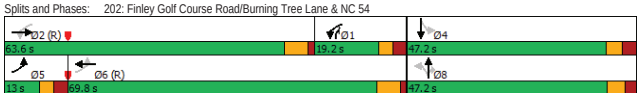
UNC DP TIA 2023 — Build (2030) AM
202: Finley Golf Course Road/Burning Tree Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	109.4	92.2		107.4	105.6			10.3	23.8		10.3	
Actuated g/C Ratio	0.84	0.71		0.83	0.81			0.08	0.18		0.08	
v/c Ratio	0.14	0.59		0.77	0.65			0.31	0.38		0.52	
Control Delay	9.6	6.3		47.7	2.4			63.8	21.5		42.2	
Queue Delay	0.0	0.0		0.0	0.1			0.0	0.0		0.0	
Total Delay	9.6	6.3		47.7	2.5			63.8	21.5		42.2	
LOS	A	A		D	A			E	C		D	
Approach Delay		6.3			6.0			29.0			42.2	
Approach LOS		A			A			C			D	
Queue Length 50th (ft)	1	100		129	39			24	39		29	
Queue Length 95th (ft)	m8	175		m#253	247			55	93		78	
Internal Link Dist (ft)		571			773			552			391	
Turn Bay Length (ft)	200			100								
Base Capacity (vph)	167	3589		285	3985			394	350		472	
Starvation Cap Reductn	0	45		0	297			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.14	0.60		0.77	0.70			0.07	0.38		0.16	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 64 (49%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 7.4 — Intersection LOS: A
Intersection Capacity Utilization 81.2% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 202: Finley Golf Course Road/Burning Tree Lane & NC 54



UNC DP TIA 2023 — Build (2030) AM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	1691	49	67	2392	37	17	0	1	8	1	120
Future Volume (vph)	161	1691	49	67	2392	37	17	0	1	8	1	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	250		250	0		125	0		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.96	1.00		0.97						
Frt			0.850			0.850		0.850			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1583	0	1770	1585	0
Flt Permitted	0.042			0.092			0.430			0.757		
Satd. Flow (perm)	78	5085	1526	171	5085	1541	801	1583	0	1410	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89			175		167			133	
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		853			1936			433			831	
Travel Time (s)		12.9			29.3			11.8			16.2	
Confl. Peds. (#/hr)	7		5	5		7						
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	179	1879	54	74	2658	41	19	0	1	9	1	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	179	1879	54	74	2658	41	19	1	0	9	134	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6		2	2		6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.3	27.3	27.3	13.3	18.3	18.3	13.8	13.8		14.3	14.3	
Total Split (s)	14.5	102.4	102.4	13.3	74.2	74.2	14.3	14.3		14.3	14.3	
Total Split (%)	11.2%	78.8%	78.8%	10.2%	57.1%	57.1%	11.0%	11.0%		11.0%	11.0%	
Maximum Green (s)	8.2	96.1	96.1	7.0	67.9	67.9	7.5	7.5		7.0	7.0	
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.0	3.0		3.5	3.5	
All-Red Time (s)	3.3	1.6	1.6	3.3	1.6	1.6	3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.8	-1.8		-2.3	-2.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag					Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	6.0	1.0	6.0	6.0	2.0	2.0		2.0	2.0	
Minimum Gap (s)	0.2	3.0	3.0	0.2	3.0	3.0	0.2	0.2		0.2	0.2	
Time Before Reduce (s)	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	40.0	40.0	0.0	40.0	40.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		14.0	14.0									
Pedestrian Calls (#/hr)		0	0									

UNC DP TIA 2023 — Build (2030) AM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	27.0
Total Split (s)	27.0
Total Split (%)	21%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0

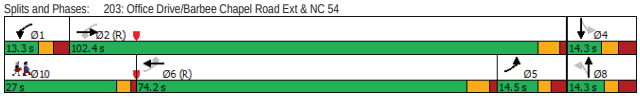
UNC DP TIA 2023 — Build (2030) AM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	105.7	100.1	100.1	106.7	96.2	96.2	9.3	9.3		9.3	9.3	
Actuated g/C Ratio	0.81	0.77	0.77	0.82	0.74	0.74	0.07	0.07		0.07	0.07	
v/c Ratio	0.96	0.48	0.05	0.31	0.71	0.03	0.33	0.00		0.09	0.57	
Control Delay	78.9	1.1	0.1	6.9	1.7	0.0	73.6	0.0		58.6	19.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	78.9	1.1	0.1	6.9	1.7	0.0	73.6	0.0		58.6	19.4	
LOS	E	A	A	A	A	A	E	A		E	B	
Approach Delay		7.7			1.8			69.9			21.9	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	104	24	0	1	28	0	16	0		7	1	
Queue Length 95th (ft)	#247	31	m0	m1	35	m0	43	0		26	65	
Internal Link Dist (ft)		773			1856			353			751	
Turn Bay Length (ft)	250		250	250		250						
Base Capacity (vph)	187	3913	1194	242	3762	1185	57	268		100	236	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	28	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.96	0.48	0.05	0.31	0.71	0.03	0.33	0.00		0.09	0.57	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 39 (30%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 5.1 — Intersection LOS: A
Intersection Capacity Utilization 81.8% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 203: Office Drive/Barbee Chapel Road Ext & NC 54



UNC DP TIA 2023 — Build (2030) AM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	Ø10
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — Build (2030) AM
204: Friday Center Lane/Meadowmont Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	1521	128	434	2343	142	62	30	24	63	20	148
Future Volume (vph)	175	1521	128	434	2343	142	62	30	24	63	20	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	12	12	12	12	12	12	12	12	12
Storage Length (ft)	250		250	250		250	0		400	225		0
Storage Lanes	2		1	2		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	1.00	0.97	1.00	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	0.97	0.99	0.98	0.98		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.982		0.950		
Satd. Flow (prot)	3433	5085	1478	3433	5085	1583	1681	1738	1583	3433	1863	1583
Flt Permitted	0.950			0.950			0.950	0.982		0.950		
Satd. Flow (perm)	3431	5085	1448	3428	5085	1547	1626	1717	1554	3354	1863	1542
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			142			158			152			149
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1936			1043			1237			723	
Travel Time (s)		29.3			15.8			24.1			14.1	
Confl. Peds. (#/hr)	9		6	6		9	8		6	6		8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	194	1690	142	482	2603	158	69	33	27	70	22	164
Shared Lane Traffic (%)							27%					
Lane Group Flow (vph)	194	1690	142	482	2603	158	50	52	27	70	22	164
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2	4	1	6	3	4	4	1	3	3	5
Permitted Phases			2			6			4			3
Detector Phase	5	2	4	1	6	3	4	4	1	3	3	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.2	34.6	14.1	14.1	38.5	14.3	14.1	14.1	14.1	14.3	14.3	14.2
Total Split (s)	17.0	70.3	14.2	31.1	84.4	14.4	14.2	14.2	31.1	14.4	14.4	17.0
Total Split (%)	13.1%	54.1%	10.9%	23.9%	64.9%	11.1%	10.9%	10.9%	23.9%	11.1%	11.1%	13.1%
Maximum Green (s)	9.8	63.7	7.1	24.0	77.9	7.1	7.1	7.1	24.0	7.1	7.1	9.8
Yellow Time (s)	3.2	4.6	3.7	3.1	4.4	4.0	3.7	3.7	3.1	4.0	4.0	3.2
All-Red Time (s)	4.0	2.0	3.4	4.0	2.1	3.3	3.4	3.4	4.0	3.3	3.3	4.0
Lost Time Adjust (s)	-2.2	-1.6	-2.1	-2.1	-1.5	-2.3	-2.1	-2.1	-2.1	-2.3	-2.3	-2.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Time Before Reduce (s)	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	C-Min	None	None	C-Min	Min	None	None	None	Min	Min	Min
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		21.0			25.0							
Pedestrian Calls (#/hr)		0			0							

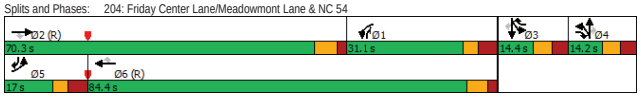
UNC DP TIA 2023 — Build (2030) AM
204: Friday Center Lane/Meadowmont Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	11.4	60.0	69.2	31.5	80.1	89.4	9.2	9.2	40.7	9.3	9.3	20.7
Actuated g/C Ratio	0.09	0.46	0.53	0.24	0.62	0.69	0.07	0.07	0.31	0.07	0.07	0.16
v/c Ratio	0.65	0.72	0.17	0.58	0.83	0.14	0.42	0.43	0.05	0.28	0.17	0.44
Control Delay	66.3	23.1	2.1	28.2	6.1	0.3	69.2	69.0	0.1	60.4	59.9	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.3	23.1	2.1	28.2	6.1	0.3	69.2	69.0	0.1	60.4	59.9	10.6
LOS	E	C	A	C	A	A	E	E	A	E	E	B
Approach Delay		25.8			9.1			54.7			28.4	
Approach LOS		C			A			D			C	
Queue Length 50th (ft)	73	473	2	152	163	0	43	45	0	29	18	9
Queue Length 95th (ft)	117	427	21	m178	m167	m0	89	91	0	54	47	61
Internal Link Dist (ft)		1856			963			1157			643	
Turn Bay Length (ft)	250		250	250		250			400	225		
Base Capacity (vph)	316	2554	840	830	3133	1116	119	123	597	248	134	381
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.66	0.17	0.58	0.83	0.14	0.42	0.42	0.05	0.28	0.16	0.43

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 120 (92%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 17.0 — Intersection LOS: B
Intersection Capacity Utilization 73.6% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 204: Friday Center Lane/Meadowmont Lane & NC 54



UNC DP TIA 2023 — Build (2030) AM
205: Barbee Chapel Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1474	224	63	2369	194	534	76	57	109	28	22
Future Volume (vph)	21	1474	224	63	2369	194	534	76	57	109	28	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		275	325		80	250		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Ped Bike Factor			0.96			0.98						
Frt			0.850			0.850		0.974			0.959	
Flt Protected	0.950			0.950			0.950	0.971		0.950	0.982	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1681	1674	0	1681	1667	0
Flt Permitted	0.061			0.071			0.950	0.971		0.950	0.982	
Satd. Flow (perm)	114	5085	1515	132	5085	1547	1681	1674	0	1681	1667	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			249			92		7			11	
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		1043			982			1263			745	
Travel Time (s)		15.8			14.9			19.1			14.5	
Confl. Peds. (#/hr)	1		7	7		1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	1638	249	70	2632	216	593	84	63	121	31	24
Shared Lane Traffic (%)							37%			27%		
Lane Group Flow (vph)	23	1638	249	70	2632	216	374	366	0	88	88	0
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	Split	NA		Split	NA	
Protected Phases	5	2	4	1	6	3	4	4		3	3	
Permitted Phases	6		2	2		6						
Detector Phase	5	2	4	1	6	3	4	4		3	3	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.8	26.5	14.2	14.0	28.5	14.2	14.2	14.2		14.2	14.2	
Total Split (s)	13.8	68.8	33.0	14.0	69.0	14.2	33.0	33.0		14.2	14.2	
Total Split (%)	10.6%	52.9%	25.4%	10.8%	53.1%	10.9%	25.4%	25.4%		10.9%	10.9%	
Maximum Green (s)	7.0	61.3	25.8	7.0	61.5	7.0	25.8	25.8		7.0	7.0	
Yellow Time (s)	3.0	4.8	4.3	3.0	4.8	3.9	4.3	4.3		3.9	3.9	
All-Red Time (s)	3.8	2.7	2.9	4.0	2.7	3.3	2.9	2.9		3.3	3.3	
Lost Time Adjust (s)	-1.8	-2.5	-2.2	-2.0	-2.5	-2.2	-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0	3.0	2.0	6.0	2.0	3.0	3.0		2.0	2.0	
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2		0.2	0.2	
Time Before Reduce (s)	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min	None	None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		12.0			14.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	74.8	63.6	91.6	73.8	69.5	78.7	28.0	28.0		9.2	9.2	

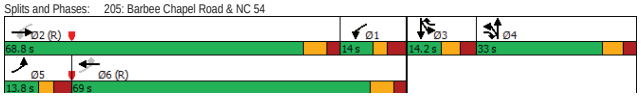
UNC DP TIA 2023 — Build (2030) AM
205: Barbee Chapel Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.58	0.49	0.70	0.57	0.53	0.61	0.22	0.22		0.07	0.07	
v/c Ratio	0.13	0.66	0.22	0.31	0.97	0.22	1.03	1.00		0.75	0.69	
Control Delay	4.7	3.9	0.3	32.5	41.2	6.8	105.7	97.0		94.0	78.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	4.7	3.9	0.3	32.5	41.2	6.8	105.7	97.0		94.0	78.1	
LOS	A	A	A	C	D	A	F	F		F	E	
Approach Delay		3.4			38.5			101.4			86.0	
Approach LOS		A			D			F			F	
Queue Length 50th (ft)	1	53	0	23	~885	43	~355	322		77	67	
Queue Length 95th (ft)	m1	48	0	44	#972	81	#564	#543		#170	#152	
Internal Link Dist (ft)		963			902			1183			665	
Turn Bay Length (ft)	275		275	325		80	250					
Base Capacity (vph)	177	2605	1155	226	2719	975	362	366		118	128	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.13	0.63	0.22	0.31	0.97	0.22	1.03	1.00		0.75	0.69	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 120 (92%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 36.4 — Intersection LOS: D
Intersection Capacity Utilization 89.2% — ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 205: Barbee Chapel Road & NC 54



UNC DP TIA 2023 — Build (2030) AM
208: Environ Way/Rogerson Dr & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑↑				↱			↱
Traffic Volume (vph)	0	1900	69	69	2436	0	0	0	23	0	0	3
Future Volume (vph)	0	1900	69	69	2436	0	0	0	23	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-4%			0%			0%	
Storage Length (ft)	0		100	250		0	0		0	0		0
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.98
Frt			0.850						0.865			0.865
Flt Protected				0.950								
Satd. Flow (prot)	0	5085	1583	1805	5187	0	0	0	1611	0	0	1611
Flt Permitted				0.073								
Satd. Flow (perm)	0	5085	1583	139	5187	0	0	0	1611	0	0	1578
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			77						415			77
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		935			651			374			582	
Travel Time (s)		14.2			9.9			8.5			13.2	
Confl. Peds. (#/hr)	2		1	1		2	3		2	2		3
Confl. Bikes (#/hr)						1						1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2111	77	77	2707	0	0	0	26	0	0	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2111	77	77	2707	0	0	0	26	0	0	3
Turn Type		NA	Prot	D.P+P	NA				custom			Perm
Protected Phases		2	2	1	6							
Permitted Phases				2								4
Detector Phase		2	2	1	6							4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0							7.0
Minimum Split (s)		30.6	30.6	31.6	16.6							22.6
Total Split (s)		75.8	75.8	31.6	107.4							22.6
Total Split (%)		58.3%	58.3%	24.3%	82.6%							17.4%
Maximum Green (s)		69.2	69.2	26.0	100.8							16.0
Yellow Time (s)		4.0	4.0	3.0	4.0							4.0
All-Red Time (s)		2.6	2.6	2.6	2.6							2.6
Lost Time Adjust (s)		-1.6	-1.6	-0.6	-1.6							-1.6
Total Lost Time (s)		5.0	5.0	5.0	5.0							5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		2.0	2.0	2.0	2.0							2.0
Recall Mode		C-Max	C-Max	None	C-Min							None
Walk Time (s)		7.0	7.0	7.0								7.0
Flash Dont Walk (s)		17.0	17.0	19.0								9.0
Pedestrian Calls (#/hr)		0	0	0								0
Act Effct Green (s)		112.5	112.5	118.3	126.3				0.0			8.6
Actuated g/C Ratio		0.87	0.87	0.91	0.97				0.00			0.07

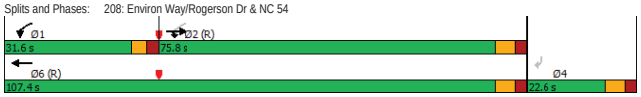
UNC DP TIA 2023 — Build (2030) AM
208: Environ Way/Rogerson Dr & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.48	0.06	0.33	0.54				0.06			0.02
Control Delay		0.8	0.1	14.0	0.4				0.3			0.3
Queue Delay		0.0	0.0	0.0	0.0				0.0			0.0
Total Delay		0.8	0.1	14.0	0.4				0.3			0.3
LOS		A	A	B	A				A			A
Approach Delay		0.7			0.8			0.3			0.3	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)		24	0	1	0				0			0
Queue Length 95th (ft)		33	m0	m30	16				0			0
Internal Link Dist (ft)		855			571			294			502	
Turn Bay Length (ft)			100	250								
Base Capacity (vph)		4401	1380	471	5038				415			280
Starvation Cap Reductn		0	0	0	107				0			0
Spillback Cap Reductn		0	0	0	0				0			0
Storage Cap Reductn		0	0	0	0				0			0
Reduced v/c Ratio		0.48	0.06	0.16	0.55				0.06			0.01

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 73 (56%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 0.8 — Intersection LOS: A
Intersection Capacity Utilization 61.9% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 208: Environ Way/Rogerson Dr & NC 54



UNC DP TIA 2023 — Build (2030) AM
301: Columbia Street & Culbreth Road/Mt Carmel Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↱		↰	↑↑	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (vph)	210	88	45	20	84	617	48	1528	4	325	858	203
Future Volume (vph)	210	88	45	20	84	617	48	1528	4	325	858	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	200		115	380		415	100		95	491		207
Storage Lanes	1		1	0		2	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98		1.00				0.98			
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950				0.991		0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	0	1920	2898	1787	3575	1599	1752	3504	1567
Flt Permitted	0.950				0.220		0.200			0.057		
Satd. Flow (perm)	1743	1835	1530	0	426	2898	376	3575	1566	105	3504	1567
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			409			108			216
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		950			859			2346			550	
Travel Time (s)		18.5			16.7			45.7			10.7	
Confl. Peds. (#/hr)			1	1			2					2
Confl. Bikes (#/hr)			2			2			1			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	233	98	50	22	93	686	53	1698	4	361	953	226
Shared Lane Traffic (%)												
Lane Group Flow (vph)	233	98	50	0	115	686	53	1698	4	361	953	226
Turn Type	custom	NA	Perm	Perm	NA	Prot	Perm	NA	Perm	pm+pt	NA	Prot
Protected Phases	4	4			3	3		2		1	6	6
Permitted Phases	4		4	3			2		2	6		
Detector Phase	4	4	4	3	3	3	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	12.0	7.0	12.0	12.0
Minimum Split (s)	13.5	13.5	13.5	13.9	13.9	13.9	18.2	18.2	18.2	12.1	25.2	25.2
Total Split (s)	24.0	24.0	24.0	40.0	40.0	40.0	70.0	70.0	70.0	26.0	96.0	96.0
Total Split (%)	15.0%	15.0%	15.0%	25.0%	25.0%	25.0%	43.8%	43.8%	43.8%	16.3%	60.0%	60.0%
Maximum Green (s)	17.6	17.6	17.6	33.1	33.1	33.1	63.8	63.8	63.8	20.9	90.5	90.5
Yellow Time (s)	4.2	4.2	4.2	4.5	4.5	4.5	4.7	4.7	4.7	3.0	4.3	4.3
All-Red Time (s)	2.2	2.2	2.2	2.4	2.4	2.4	1.5	1.5	1.5	2.1	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4		6.9	6.9	6.2	6.2	6.2	5.1	5.5	5.5
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	6.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	15.0	0.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0	45.0	0.0	45.0	45.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)											7.0	7.0
Flash Dont Walk (s)											12.0	12.0

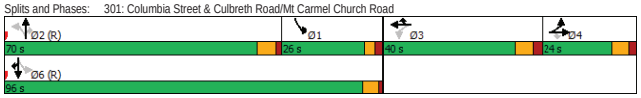
UNC DP TIA 2023 — Build (2030) AM
301: Columbia Street & Culbreth Road/Mt Carmel Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)											0	0
Act Effct Green (s)	17.6	17.6	17.6		33.1	33.1	63.8	63.8	63.8	90.9	90.5	90.5
Actuated g/C Ratio	0.11	0.11	0.11		0.21	0.21	0.40	0.40	0.40	0.57	0.57	0.57
v/c Ratio	1.22	0.49	0.19		1.31	0.74	0.36	1.19	0.01	1.32	0.48	0.23
Control Delay	192.8	75.9	1.6		245.9	28.7	29.9	127.8	0.0	209.1	14.6	1.5
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	192.8	75.9	1.6		245.9	28.7	29.9	127.8	0.0	209.1	14.6	1.5
LOS	F	E	A		F	C	C	F	A	F	B	A
Approach Delay		137.7			59.9			124.5			58.3	
Approach LOS		F			E			F			E	
Queue Length 50th (ft)	~297	98	0		~154	160	37	~1133	0	~448	205	7
Queue Length 95th (ft)	#479	164	0		#292	244	m64	#1270	m0	#665	238	16
Internal Link Dist (ft)		870			779			2266			470	
Turn Bay Length (ft)	200		115			415	100		95	491		207
Base Capacity (vph)	191	201	262		88	923	149	1425	689	274	1981	980
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.22	0.49	0.19		1.31	0.74	0.36	1.19	0.01	1.32	0.48	0.23

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 149 (93%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.32
Intersection Signal Delay: 91.3 — Intersection LOS: F
Intersection Capacity Utilization 93.3% — ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 301: Columbia Street & Culbreth Road/Mt Carmel Church Road



UNC DP TIA 2023 — Build (2030) AM
302: Columbia Street & Arlen Park Drive/Bennett Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	19	6	64	18	7	4	1435	86	64	851	61
Future Volume (vph)	88	19	6	64	18	7	4	1435	86	64	851	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	350		350	350		350
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00		1.00	1.00		1.00		0.98	1.00		0.98
Frt		0.962			0.957				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1786	0	1770	1776	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.739			0.739			0.950			0.950		
Satd. Flow (perm)	1377	1786	0	1374	1776	0	1767	3539	1547	1767	3539	1544
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			8				96			73
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		358			1313			2727			2346	
Travel Time (s)		9.8			25.6			53.1			45.7	
Confl. Peds. (#/hr)			1	1			1		2	2		1
Confl. Bikes (#/hr)						1			2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	98	21	7	71	20	8	4	1594	96	71	946	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	28	0	71	28	0	4	1594	96	71	946	68
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	36.6	36.6		14.1	14.1		13.6	20.6	20.6	12.9	24.6	24.6
Total Split (s)	38.0	38.0		38.0	38.0		14.0	102.0	102.0	20.0	108.0	108.0
Total Split (%)	23.8%	23.8%		23.8%	23.8%		8.8%	63.8%	63.8%	12.5%	67.5%	67.5%
Maximum Green (s)	31.4	31.4		30.9	30.9		7.4	95.4	95.4	14.1	101.4	101.4
Yellow Time (s)	3.2	3.2		3.8	3.8		3.0	4.6	4.6	3.0	4.6	4.6
All-Red Time (s)	3.4	3.4		3.3	3.3		3.6	2.0	2.0	2.9	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		7.1	7.1		6.6	6.6	6.6	5.9	6.6	6.6
Lead/Lag							Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		1.0	1.0		2.0	6.0	6.0	1.0	6.0	6.0
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	25.0	25.0	0.0	25.0	25.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	55.0	55.0	0.0	55.0	55.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	4.0	4.0									7.0	7.0
Flash Dont Walk (s)	26.0	26.0									10.0	10.0
Pedestrian Calls (#/hr)	0	0									0	0

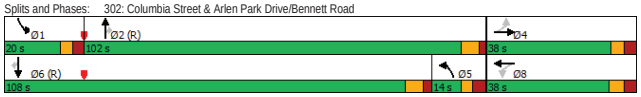
UNC DP TIA 2023 — Build (2030) AM
302: Columbia Street & Arlen Park Drive/Bennett Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	15.8	15.8		15.3	15.3		7.1	115.0	115.0	10.2	128.2	128.2
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.04	0.72	0.72	0.06	0.80	0.80
v/c Ratio	0.73	0.15		0.54	0.16		0.05	0.63	0.08	0.63	0.33	0.05
Control Delay	97.5	52.5		82.9	51.2		70.0	11.3	0.5	107.8	2.4	0.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.5	52.5		82.9	51.2		70.0	11.3	0.5	107.8	2.4	0.3
LOS	F	D		F	D		E	B	A	F	A	A
Approach Delay		87.5			73.9			10.8			9.2	
Approach LOS		F			E			B			A	
Queue Length 50th (ft)	101	20		72	20		4	424	1	61	8	0
Queue Length 95th (ft)	163	52		124	51		m7	563	9	m109	m303	m6
Internal Link Dist (ft)		278			1233			2647			2266	
Turn Bay Length (ft)	150			150			350		350	350		350
Base Capacity (vph)	270	356		265	349		81	2542	1138	156	2836	1251
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.08		0.27	0.08		0.05	0.63	0.08	0.46	0.33	0.05

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 72 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 15.5 — Intersection LOS: B
Intersection Capacity Utilization 73.4% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 302: Columbia Street & Arlen Park Drive/Bennett Road



Build (2030) AM.syn — VHB

UNC DP TIA 2023 — Build (2030) AM
303: Columbia Street & Market Street — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	219	42	181	1202	6	592	373
Future Volume (vph)	219	42	181	1202	6	592	373
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0	350		250		350
Storage Lanes	1	1	1		1		1
Taper Length (ft)	25		25		25		
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Frt		0.850					0.850
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1770	1583	1770	3539	1770	3539	1583
Flt Permitted	0.950		0.950		0.205		
Satd. Flow (perm)	1770	1583	1770	3539	382	3539	1583
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		47					414
Link Speed (mph)	25			35		35	
Link Distance (ft)	416			1017		2727	
Travel Time (s)	11.3			19.8		53.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	243	47	201	1336	7	658	414
Shared Lane Traffic (%)							
Lane Group Flow (vph)	243	47	201	1336	7	658	414
Turn Type	Prot	Perm	Prot	NA	Perm	NA	Perm
Protected Phases	4		5	2		6	
Permitted Phases		4			6		6
Detector Phase	4	4	5	2	6	6	6
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	12.0
Minimum Split (s)	14.1	14.1	12.8	20.4	20.0	20.0	20.0
Total Split (s)	26.0	26.0	23.0	54.0	31.0	31.0	31.0
Total Split (%)	32.5%	32.5%	28.8%	67.5%	38.8%	38.8%	38.8%
Maximum Green (s)	19.9	19.9	17.2	47.6	25.0	25.0	25.0
Yellow Time (s)	3.0	3.0	3.0	5.0	4.6	4.6	4.6
All-Red Time (s)	3.1	3.1	2.8	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	5.8	6.4	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	1.0	6.0	6.0	6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	45.0	45.0	45.0	45.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	15.7	15.7	12.3	51.8	34.1	34.1	34.1
Actuated g/C Ratio	0.20	0.20	0.15	0.65	0.43	0.43	0.43
v/c Ratio	0.70	0.14	0.74	0.58	0.04	0.44	0.45
Control Delay	40.7	8.7	47.9	9.9	15.0	13.4	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	8.7	47.9	9.9	15.0	13.4	4.9

Build (2030) AM.syn — VHB

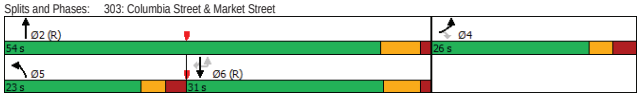
UNC DP TIA 2023 — Build (2030) AM
303: Columbia Street & Market Street — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
LOS	D	A	D	A	B	B	A
Approach Delay	35.5			14.9		10.2	
Approach LOS	D			B		B	
Queue Length 50th (ft)	113	0	97	177	2	101	3
Queue Length 95th (ft)	178	25	155	271	m8	167	84
Internal Link Dist (ft)	336			937		2647	
Turn Bay Length (ft)	150		350		250		350
Base Capacity (vph)	440	429	380	2292	162	1507	912
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.11	0.53	0.58	0.04	0.44	0.45

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 21 (26%), Referenced to phase 2:NBT and 6:SBTU, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 15.2 — Intersection LOS: B
Intersection Capacity Utilization 70.8% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 303: Columbia Street & Market Street



Build (2030) AM.syn — VHB



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	112	3	31	31	4	86
Future Volume (vph)	112	3	31	31	4	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997		0.932			
Flt Protected	0.953					0.998
Satd. Flow (prot)	1770	0	1736	0	0	1859
Flt Permitted	0.953					0.998
Satd. Flow (perm)	1770	0	1736	0	0	1859
Link Speed (mph)	25		25			25
Link Distance (ft)	398		535			551
Travel Time (s)	10.9		14.6			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	124	3	34	34	4	96
Shared Lane Traffic (%)						
Lane Group Flow (vph)	127	0	68	0	0	100
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	20.8%	ICU Level of Service A	
Analysis Period (min)	15		

Intersection

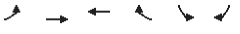
Int Delay, s/veh	4.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	112	3	31	31	4	86
Future Vol, veh/h	112	3	31	31	4	86
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	124	3	34	34	4	96

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	155	51	0	0	68	0
Stage 1	51	-	-	-	-	-
Stage 2	104	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	836	1017	-	-	1533	-
Stage 1	971	-	-	-	-	-
Stage 2	920	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	833	1017	-	-	1533	-
Mov Cap-2 Maneuver	833	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	917	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	837	1533	-
HCM Lane V/C Ratio	-	-	0.153	0.003	-
HCM Control Delay (s)	-	-	10.1	7.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	405	426	0	0	142
Future Volume (vph)	0	405	426	0	0	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	0	1611
Link Speed (mph)		25	25		30	
Link Distance (ft)		312	90		92	
Travel Time (s)		8.5	2.5		2.1	
Confl. Peds. (#/hr)						9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	450	473	0	0	158
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	450	473	0	0	158
Sign Control		Free	Free		Yield	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	39.8%	ICU Level of Service A	
Analysis Period (min)	15		



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	165	638	5	21	178	36
Future Volume (vph)	165	638	5	21	178	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.893				0.977	
Flt Protected				0.990	0.960	
Satd. Flow (prot)	1663	0	0	1844	1747	0
Flt Permitted				0.990	0.960	
Satd. Flow (perm)	1663	0	0	1844	1747	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	215			564	517	
Travel Time (s)	4.2			11.0	10.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	183	709	6	23	198	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	892	0	0	29	238	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	66.7%	ICU Level of Service C	
Analysis Period (min)	15		

UNC DP TIA 2023 — Build (2030) AM
313: Ridge Road & Country Club Road — HCM 2010 TWSC

Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	165	638	5	21	178	36
Future Vol, veh/h	165	638	5	21	178	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	183	709	6	23	198	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	892	0	573	538
Stage 1	-	-	-	-	538	-
Stage 2	-	-	-	-	35	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	760	-	481	543
Stage 1	-	-	-	-	585	-
Stage 2	-	-	-	-	987	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	760	-	477	543
Mov Cap-2 Maneuver	-	-	-	-	477	-
Stage 1	-	-	-	-	585	-
Stage 2	-	-	-	-	979	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	19.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	487	-	-	760	-
HCM Lane V/C Ratio	0.488	-	-	0.007	-
HCM Control Delay (s)	19.2	-	-	9.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.6	-	-	0	-

UNC DP TIA 2023 — Build (2030) AM
325: Columbia Street & Pittsboro Street — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	414	0	794	61	0
Future Volume (vph)	0	414	0	794	61	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			0%	4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	1825	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	1825	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	384			956	267	
Travel Time (s)	8.7			26.1	7.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	460	0	882	68	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	460	0	882	68	0
Sign Control	Free			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

UNC DP TIA 2023 — Build (2030) AM
329: Pittsboro Street & Manning Drive — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	572	414
Future Volume (vph)	0	0	0	0	572	414
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt						
Flt Protected					0.950	0.991
Satd. Flow (prot)	0	0	0	0	1681	1754
Flt Permitted					0.950	0.991
Satd. Flow (perm)	0	0	0	0	1681	1754
Link Speed (mph)	25		30			25
Link Distance (ft)	218		384			1147
Travel Time (s)	5.9		8.7			31.3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	636	460
Shared Lane Traffic (%)					16%	
Lane Group Flow (vph)	0	0	0	0	534	562
Sign Control	Free		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

UNC DP TIA 2023 — Build (2030) AM
350: Fordham Blvd & Oteys Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2505	1370	90	0	17
Future Volume (vph)	0	2505	1370	90	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	10	10
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.991			0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3507	0	0	1504
Flt Permitted						
Satd. Flow (perm)	0	3539	3507	0	0	1504
Link Speed (mph)		45	45		25	
Link Distance (ft)		2437	1661		324	
Travel Time (s)		36.9	25.2		8.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2783	1522	100	0	19
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2783	1622	0	0	19
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

UNC DP TIA 2023 — Build (2030) AM
350: Fordham Blvd & Oteys Road — HCM 2010 TWSC

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Vol, veh/h	0	2505	1370	90	0	17
Future Vol, veh/h	0	2505	1370	90	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2783	1522	100	0	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	811
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	322
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	322
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.9
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	322
HCM Lane V/C Ratio	-	-	-	0.059
HCM Control Delay (s)	-	-	-	16.9
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.2

UNC DP TIA 2023 — Build (2030) AM
357: Fordham Blvd & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Volume (vph)	0	2200	746	0	0	311
Future Volume (vph)	0	2200	746	0	0	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3539	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	0	0	1611
Link Speed (mph)		45	45		25	
Link Distance (ft)		1088	445		1226	
Travel Time (s)		16.5	6.7		33.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2444	829	0	0	346
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2444	829	0	0	346
Sign Control		Free	Free		Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 64.1%		ICU Level of Service C	
Analysis Period (min) 15			

UNC DP TIA 2023 — Build (2030) AM
358: NC 54 EB Ramps & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		
Traffic Volume (vph)	1498	778	0	773	0	0
Future Volume (vph)	1498	778	0	773	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.949					
Flt Protected						
Satd. Flow (prot)	3359	0	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	3359	0	0	3539	0	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	445			1758	975	
Travel Time (s)	6.7			26.6	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1664	864	0	859	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2528	0	0	859	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 116.0%		ICU Level of Service H	
Analysis Period (min) 15			

UNC DP TIA 2023 — Build (2030) AM
359: Columbia Street & NC 54 EB Ramps — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑			↑↑
Traffic Volume (vph)	0	0	1079	1029	0	1268
Future Volume (vph)	0	0	1079	1029	0	1268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt			0.927			
Flt Protected						
Satd. Flow (prot)	0	0	3281	0	0	3539
Flt Permitted						
Satd. Flow (perm)	0	0	3281	0	0	3539
Link Speed (mph)	35		25			25
Link Distance (ft)	424		550			219
Travel Time (s)	8.3		15.0			6.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	1199	1143	0	1409
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	2342	0	0	1409
Sign Control	Free		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.2%		ICU Level of Service C	
Analysis Period (min) 15			

UNC DP TIA 2023 — Build (2030) AM
360: NC 54 EB Ramps & Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	68	0	0	1029	0	0
Future Volume (vph)	68	0	0	1029	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	1863	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	1863	0	0
Link Speed (mph)	30			35	30	
Link Distance (ft)	270			424	706	
Travel Time (s)	6.1			8.3	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	0	0	1143	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	76	0	0	1143	0	0
Sign Control	Free			Yield	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 64.6% — ICU Level of Service C
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
361: NC 54 EB Ramps & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1498	0	0	773	0	1097
Future Volume (vph)	1498	0	0	773	0	1097
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1611
Link Speed (mph)	45			45	30	
Link Distance (ft)	1758			301	706	
Travel Time (s)	26.6			4.6	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1664	0	0	859	0	1219
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1664	0	0	859	0	1219
Sign Control	Free			Free	Yield	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 116.0% — ICU Level of Service H
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
362: Fordham Blvd & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2595	773	663	0	0
Future Volume (vph)	0	2595	773	663	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			250	0	0
Storage Lanes	0			1	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3539	3539	1583	0	0
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	1583	0	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		301	2437		1188	
Travel Time (s)		4.6	36.9		32.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2883	859	737	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2883	859	737	0	0
Sign Control		Free	Free		Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 75.1% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
1051: US 15/501 NB & NB/EB U-Turn — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	333	1907	0	0	0	0
Future Volume (vph)	333	1907	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	3400	3505	0	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3400	3505	0	0	0	0
Link Speed (mph)		30	45		30	
Link Distance (ft)		605	492		205	
Travel Time (s)		13.8	7.5		4.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	370	2119	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	370	2119	0	0	0	0
Sign Control		Free	Free		Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 116.8% — ICU Level of Service H
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
1052: SB/WB U-Turn & US 15/501 SB — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	80	2427	0	0
Future Volume (vph)	0	0	80	2427	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	250		0	0
Storage Lanes		0	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00
Frt						
Flt Protected			0.950			
Satd. Flow (prot)	0	0	3433	3539	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	3433	3539	0	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	1322			777	186	
Travel Time (s)	20.0			11.8	4.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	89	2697	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	89	2697	0	0
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 80.4% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
5001: US 15/501/US 15/501 SB & US 15/501 NB — Lanes, Volumes, Timings

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	0	1203	0	1383	0	0
Future Volume (vph)	0	1203	0	1383	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	0	2787	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	0	2787	0	3539	0	0
Link Speed (mph)	45			45	45	
Link Distance (ft)	811			1322	1186	
Travel Time (s)	12.3			20.0	18.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1337	0	1537	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1337	0	1537	0	0
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 45.4% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) AM
5002: US 15/501 SB/US 15/501 — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	2060	0	1907
Future Volume (vph)	0	0	0	2060	0	1907
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.88
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	0	2787
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	0	2787
Link Speed (mph)	45			45	45	
Link Distance (ft)	295			829	492	
Travel Time (s)	4.5			12.6	7.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	2289	0	2119
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	2289	0	2119
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 70.0% — ICU Level of Service C
Analysis Period (min) 15

INTERSECTION LEVEL OF SERVICE WORKSHEETS
BUILD (2030) PM

UNC DP TIA 2023 — Build (2030) PM
1: Columbia Street & Rosemary Street — Lanes, Volumes, Timings

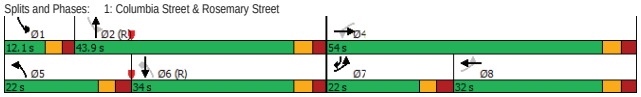
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	13	157	23	9	25	165	493	29	19	363	189
Future Volume (vph)	195	13	157	23	9	25	165	493	29	19	363	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	0		0	0		0	125		0	0		0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			50			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.94	0.92		0.94	0.95		0.82	0.98		0.87		0.60
Frt		0.861			0.889			0.992				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1433	1324	0	1486	1318	0	1433	2734	0	1433	2867	1378
Flt Permitted	0.732			0.608			0.456			0.354		
Satd. Flow (perm)	1043	1324	0	896	1318	0	562	2734	0	462	2867	833
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		174			28			6				210
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		783			945			370			503	
Travel Time (s)		21.4			25.8			10.1			13.7	
Confl. Peds. (#/hr)	46		59	59		46	111		129	129		111
Confl. Bikes (#/hr)			2			2			15			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)								0				
Adj. Flow (vph)	217	14	174	26	10	28	183	548	32	21	403	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	217	188	0	26	38	0	183	580	0	21	403	210
Turn Type	D.P+P	NA		D.Pm	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	8			4			6			2		6
Detector Phase	7	4		4	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.8	31.0		31.0	32.0		12.8	22.8		12.1	21.8	12.8
Total Split (s)	22.0	54.0		54.0	32.0		22.0	43.9		12.1	34.0	22.0
Total Split (%)	20.0%	49.1%		49.1%	29.1%		20.0%	39.9%		11.0%	30.9%	20.0%
Maximum Green (s)	16.2	48.0		48.0	26.0		16.2	38.1		7.0	28.2	16.2
Yellow Time (s)	3.0	3.2		3.2	3.2		3.0	3.3		3.0	3.3	3.0
All-Red Time (s)	2.8	2.8		2.8	2.8		2.8	2.5		2.1	2.5	2.8
Lost Time Adjust (s)	-0.8	-0.8		-1.0	-1.0		-0.8	-0.8		0.1	0.1	-0.8
Total Lost Time (s)	5.0	5.2		5.0	5.0		5.0	5.0		5.2	5.9	5.0
Lead/Lag	Lead				Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes				Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Recall Mode	None	Ped		Ped	Ped		None	C-Max		None	C-Max	None
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)		18.0		18.0	19.0			10.0			9.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	41.5	46.3		46.5	27.0		48.5	48.6		51.2	35.0	50.4

UNC DP TIA 2023 — Build (2030) PM
1: Columbia Street & Rosemary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.38	0.42		0.42	0.25		0.44	0.44		0.47	0.32	0.46
v/c Ratio	0.49	0.29		0.07	0.11		0.53	0.48		0.08	0.44	0.37
Control Delay	25.5	4.7		18.5	16.1		14.7	18.4		16.7	33.2	4.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.9		0.0	0.0	0.0
Total Delay	25.5	4.7		18.5	16.1		14.7	19.4		16.7	33.2	4.5
LOS	C	A		B	B		B	B		B	C	A
Approach Delay		15.8			17.1			18.2			23.1	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)	100	6		11	5		72	141		8	120	0
Queue Length 95th (ft)	158	46		28	32		m94	m224		22	181	40
Internal Link Dist (ft)		703			865			290			423	
Turn Bay Length (ft)							125					
Base Capacity (vph)	473	684		399	344		398	1212		276	911	593
Starvation Cap Reductn	0	0		0	0		0	357		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.46	0.27		0.07	0.11		0.46	0.68		0.08	0.44	0.35

Intersection Summary
Area Type: CBD
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 65 (59%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 19.3 — Intersection LOS: B
Intersection Capacity Utilization 63.6% — ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Columbia Street & Rosemary Street



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
2: Columbia Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	463	78	130	429	211	71	339	81	229	262	69
Future Volume (vph)	118	463	78	130	429	211	71	339	81	229	262	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	0		0	250		0	600		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			50		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.87	0.95		0.85	0.89		0.82	0.93		0.83	0.94	
Frt		0.978			0.951			0.971			0.969	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1433	2958	0	1486	2504	0	1433	2694	0	1433	2603	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1252	2958	0	1266	2504	0	1181	2694	0	1184	2603	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			78			24			30	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		795			952			972			370	
Travel Time (s)		21.7			26.0			26.5			10.1	
Confl. Peds. (#/hr)	331		338	338		331	196		308	308		196
Confl. Bikes (#/hr)			4			9			17			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	131	514	87	144	477	234	79	377	90	254	291	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	131	601	0	144	711	0	79	467	0	254	368	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.4	28.2		12.9	28.2		12.9	27.9		12.9	27.7	
Total Split (s)	17.0	35.5		19.6	38.1		17.7	27.9		27.0	37.2	
Total Split (%)	15.5%	32.3%		17.8%	34.6%		16.1%	25.4%		24.5%	33.8%	
Maximum Green (s)	11.6	29.3		13.7	31.9		11.8	22.0		21.1	31.5	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.3		3.0	3.1	
All-Red Time (s)	2.4	3.2		2.9	3.2		2.9	2.6		2.9	2.6	
Lost Time Adjust (s)	-0.4	-1.2		-0.9	-1.2		-0.9	-0.9		-0.9	-0.7	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	2.0	
Recall Mode	None	C-Max		None	C-Max		None	Ped		None	Ped	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	11.4	32.8		13.2	34.6		10.3	22.9		21.1	36.2	
Actuated g/C Ratio	0.10	0.30		0.12	0.31		0.09	0.21		0.19	0.33	

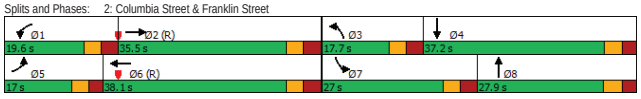
Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
2: Columbia Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.88	0.67		0.81	0.85		0.59	0.81		0.93	0.42	
Control Delay	97.1	38.0		67.7	30.3		65.2	51.3		67.4	28.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	97.1	38.0		67.7	30.3		65.2	51.3		67.4	28.5	
LOS	F	D		E	C		E	D		E	C	
Approach Delay		48.6			36.6			53.3			44.4	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	92	196		104	159		54	158		181	127	
Queue Length 95th (ft)	#202	263		m126	m#266		104	#235		#325	177	
Internal Link Dist (ft)		715			872			892			290	
Turn Bay Length (ft)				250			600			125		
Base Capacity (vph)	156	894		197	840		165	579		286	877	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.84	0.67		0.73	0.85		0.48	0.81		0.89	0.42	

Intersection Summary
Area Type: CBD
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 54 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 44.8 — Intersection LOS: D
Intersection Capacity Utilization 80.0% — ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Columbia Street & Franklin Street



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
3: Raleigh Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	570	212	47	612	262	124	309	60	139	254	26
Future Volume (vph)	37	570	212	47	612	262	124	309	60	139	254	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	10	9	10	11	12	12	12	10	10	10
Storage Length (ft)	100		0	100		0	0		0	150		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.97		0.98	0.95			0.98		0.99	0.99	
Frt		0.959			0.955			0.983			0.986	
Flt Protected	0.950			0.950				0.988		0.950		
Satd. Flow (prot)	1433	2671	0	1433	2691	0	0	1619	0	1486	1527	0
Flt Permitted	0.198			0.211				0.837		0.423		
Satd. Flow (perm)	292	2671	0	313	2691	0	0	1355	0	654	1527	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		114			141			17			10	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1179			1100			994			364	
Travel Time (s)		32.2			30.0			27.1			9.9	
Confl. Peds. (#/hr)	57		29	29		57	95		34	34		95
Confl. Bikes (#/hr)			7									1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	41	633	236	52	680	291	138	343	67	154	282	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	869	0	52	971	0	0	548	0	154	311	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		D.Pm	NA	
Protected Phases		2			6		7	4			8	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		6	6		7	4		4	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	19.8	19.8		19.8	19.8		8.0	20.0		20.0	20.0	
Total Split (s)	26.0	26.0		26.0	26.0		8.0	29.0		29.0	21.0	
Total Split (%)	47.3%	47.3%		47.3%	47.3%		14.5%	52.7%		52.7%	38.2%	
Maximum Green (s)	21.2	21.2		21.2	21.2		4.0	25.0		25.0	17.0	
Yellow Time (s)	3.3	3.3		3.1	3.1		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.7	1.7		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	-0.1	-0.1		-0.1	-0.1			-0.6		-1.2	-1.2	
Total Lost Time (s)	4.7	4.7		4.7	4.7			3.4		2.8	2.8	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)	4.0	4.0		4.0	4.0			5.0		5.0	5.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0			11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	
Act Effct Green (s)	20.2	20.2		20.2	20.2			26.7		27.3	27.3	
Actuated g/C Ratio	0.37	0.37		0.37	0.37			0.49		0.50	0.50	

UNC DP TIA 2023 — Build (2030) PM
3: Raleigh Street & Franklin Street — Lanes, Volumes, Timings

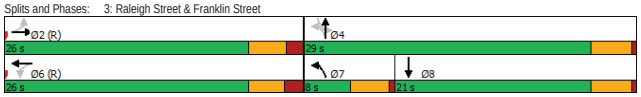
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.38	0.82		0.45	0.90			0.82		0.48	0.41	
Control Delay	15.6	14.5		22.4	22.9			22.2		16.1	11.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	15.6	14.5		22.4	22.9			22.2		16.1	11.0	
LOS	B	B		C	C			C		B	B	
Approach Delay		14.6			22.8			22.2			12.7	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	10	104		12	127			229		32	59	
Queue Length 95th (ft)	m17	m155		m24	#239			m279		81	112	
Internal Link Dist (ft)		1099			1020			914			284	
Turn Bay Length (ft)	100			100						150		
Base Capacity (vph)	113	1104		121	1128			665		324	761	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.36	0.79		0.43	0.86			0.82		0.48	0.41	

Intersection Summary

Area Type: CBD
Cycle Length: 55
Actuated Cycle Length: 55
Offset: 5 (9%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 18.6 — Intersection LOS: B
Intersection Capacity Utilization 99.5% — ICU Level of Service F
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Raleigh Street & Franklin Street



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
4: Merritt Mill Road & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
Lane Configurations							
Traffic Volume (vph)	342	214	142	188	80	286	
Future Volume (vph)	342	214	142	188	80	286	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	14	14	15	15	9	12	
Storage Length (ft)	0	250		0	25		
Storage Lanes	1	1		0	1		
Taper Length (ft)	25				50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor	0.93	0.78	0.99				
Frt		0.850	0.923				
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1699	1520	1681	0	1433	1676	
Flt Permitted	0.950				0.372		
Satd. Flow (perm)	1581	1182	1681	0	561	1676	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)		238	68				
Link Speed (mph)	25		25			25	
Link Distance (ft)	1645		945			1000	
Travel Time (s)	44.9		25.8			27.3	
Confl. Peds. (#/hr)	35	50					
Confl. Bikes (#/hr)		121		1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	380	238	158	209	89	318	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	380	238	367	0	89	318	
Turn Type	Prot	pm+ov	NA		D.P+P	NA	
Protected Phases	3	1	2		1	6	4
Permitted Phases		3			2		
Detector Phase	3	1	2		1	6	
Switch Phase							
Minimum Initial (s)	7.0	7.0	10.0		7.0	10.0	7.0
Minimum Split (s)	12.1	11.6	14.9		11.6	14.9	25.0
Total Split (s)	28.0	11.8	25.2		11.8	37.0	25.0
Total Split (%)	31.1%	13.1%	28.0%		13.1%	41.1%	28%
Maximum Green (s)	22.9	7.2	20.3		7.2	32.1	22.0
Yellow Time (s)	3.0	3.0	3.1		3.0	3.1	3.0
All-Red Time (s)	2.1	1.6	1.8		1.6	1.8	0.0
Lost Time Adjust (s)	0.1	0.4	0.1		0.4	0.4	
Total Lost Time (s)	5.2	5.0	5.0		5.0	5.3	
Lead/Lag	Lead	Lead	Lag		Lead		Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes
Vehicle Extension (s)	1.0	2.0	3.0		2.0	3.0	0.2
Recall Mode	None	None	Min		None	Min	None
Walk Time (s)							7.0
Flash Dont Walk (s)							15.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	17.9	24.9	16.8		23.6	28.4	
Actuated g/C Ratio	0.31	0.44	0.29		0.41	0.50	

Build (2030) PM.syn — VHB

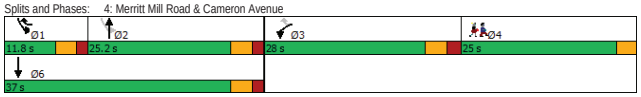
UNC DP TIA 2023 — Build (2030) PM
4: Merritt Mill Road & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø4
v/c Ratio	0.71	0.34	0.67		0.26	0.38	
Control Delay	26.2	2.9	21.8		10.8	11.2	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	26.2	2.9	21.8		10.8	11.2	
LOS	C	A	C		B	B	
Approach Delay	17.2		21.8			11.1	
Approach LOS	B		C			B	
Queue Length 50th (ft)	116	0	89		15	64	
Queue Length 95th (ft)	208	27	185		40	128	
Internal Link Dist (ft)	1565		865			920	
Turn Bay Length (ft)		250			25		
Base Capacity (vph)	692	693	650		339	950	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.55	0.34	0.56		0.26	0.33	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 57
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 16.6 — Intersection LOS: B
Intersection Capacity Utilization 60.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Merritt Mill Road & Cameron Avenue



Build (2030) PM.syn — VHB

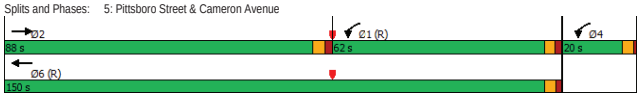
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø4
Lane Configurations								
Traffic Volume (vph)	175	165	572	430	0	0		
Future Volume (vph)	175	165	572	430	0	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	12	11	12	12	12		
Storage Length (ft)		0	0		0	0		
Storage Lanes		0	2		0	0		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	1.00		
Ped Bike Factor	0.98		0.98					
Frt	0.934							
Flt Protected			0.950					
Satd. Flow (prot)	1537	0	2987	1676	0	0		
Flt Permitted			0.950					
Satd. Flow (perm)	1537	0	2932	1676	0	0		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)	39							
Link Speed (mph)	25			25	25			
Link Distance (ft)	1117			376	564			
Travel Time (s)	30.5			10.3	15.4			
Confl. Peds. (#/hr)		4	4		74	1		
Confl. Bikes (#/hr)		18						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Adj. Flow (vph)	194	183	636	478	0	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	377	0	636	478	0	0		
Turn Type	NA		Prot	NA				
Protected Phases	2		1 4	6			1	4
Permitted Phases								
Detector Phase	2		1 4	6				
Switch Phase								
Minimum Initial (s)	10.0			10.0			7.0	7.0
Minimum Split (s)	16.2			15.0			12.1	20.0
Total Split (s)	88.0			150.0			62.0	20.0
Total Split (%)	51.8%			88.2%			36%	12%
Maximum Green (s)	82.8			145.0			56.9	16.0
Yellow Time (s)	3.1			3.3			3.0	3.0
All-Red Time (s)	2.1			1.7			2.1	1.0
Lost Time Adjust (s)	-0.2			0.0				
Total Lost Time (s)	5.0			5.0				
Lead/Lag	Lead						Lag	
Lead-Lag Optimize?								
Vehicle Extension (s)	1.0			1.0			4.0	0.2
Recall Mode	Min			C-Min			C-Max	None
Walk Time (s)	7.0							7.0
Flash Dont Walk (s)	4.0							9.0
Pedestrian Calls (#/hr)	0							0
Act Effct Green (s)	45.3		114.7	154.0				
Actuated g/C Ratio	0.27		0.67	0.91				

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø4
v/c Ratio	0.86		0.32	0.31				
Control Delay	71.3		7.5	1.3				
Queue Delay	0.0		0.6	2.5				
Total Delay	71.3		8.1	3.8				
LOS	E		A	A				
Approach Delay	71.3			6.2				
Approach LOS	E			A				
Queue Length 50th (ft)	367		86	58				
Queue Length 95th (ft)	449		m161	m45				
Internal Link Dist (ft)	1037			296	484			
Turn Bay Length (ft)								
Base Capacity (vph)	770		2173	1518				
Starvation Cap Reductn	0		1083	889				
Spillback Cap Reductn	0		0	0				
Storage Cap Reductn	0		0	0				
Reduced v/c Ratio	0.49		0.58	0.76				

Intersection Summary

Area Type: CBD
Cycle Length: 170
Actuated Cycle Length: 170
Offset: 128 (75%), Referenced to phase 1:WBL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 22.7 Intersection LOS: C
Intersection Capacity Utilization 55.1% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Pittsboro Street & Cameron Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	149	0	0	305	58	239	510	204	133	0	446
Future Volume (vph)	20	149	0	0	305	58	239	510	204	133	0	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	10	10	10	11	11	12
Storage Length (ft)	110		0	0		0	0		0	300		0
Storage Lanes	1		0	0		0	1		0	1		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.95	1.00	1.00	0.88
Ped Bike Factor					0.95		0.55	0.81		0.80		0.38
Frt					0.979			0.959				0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1540	1676	0	0	1562	0	1353	2239	0	1540	0	2508
Flt Permitted	0.101						0.950	0.998		0.950		
Satd. Flow (perm)	164	1676	0	0	1562	0	746	2206	0	1228	0	957
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)					5			32				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		376			2112			887			972	
Travel Time (s)		10.3			57.6			24.2			26.5	
Confl. Peds. (#/hr)	132		360	360		132	245		165	165		245
Confl. Bikes (#/hr)			9			35			12			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	22	166	0	0	339	64	266	567	227	148	0	496
Shared Lane Traffic (%)							10%					
Lane Group Flow (vph)	22	166	0	0	403	0	239	821	0	148	0	496
Turn Type	Perm	NA			NA		Split	NA		Prot		Prot
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Detector Phase	4	4			8		2	2		1		1
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		7.0	7.0		7.0		7.0
Minimum Split (s)	27.1	27.1			30.2		23.2	23.2		25.6		25.6
Total Split (s)	44.6	44.6			44.6		60.2	60.2		37.2		37.2
Total Split (%)	26.2%	26.2%			26.2%		35.4%	35.4%		21.9%		21.9%
Maximum Green (s)	38.5	38.5			38.4		54.0	54.0		31.6		31.6
Yellow Time (s)	3.1	3.1			3.2		3.1	3.1		3.0		3.0
All-Red Time (s)	3.0	3.0			3.0		3.1	3.1		2.6		2.6
Lost Time Adjust (s)	-1.2	-1.2			-1.2		-1.2	-1.2		-0.6		-0.6
Total Lost Time (s)	4.9	4.9			5.0		5.0	5.0		5.0		5.0
Lead/Lag							Lag	Lag		Lead		Lead
Lead-Lag Optimize?							Yes	Yes		Yes		Yes
Vehicle Extension (s)	2.0	2.0			2.0		4.0	4.0		4.0		4.0
Recall Mode	Min	Min			Min		C-Max	C-Max		None		None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0		7.0
Flash Dont Walk (s)	10.0	10.0			17.0		5.0	5.0		13.0		13.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0		0
Act Effct Green (s)	39.7	39.7			39.6		55.2	55.2		32.2		32.2
Actuated g/C Ratio	0.23	0.23			0.23		0.32	0.32		0.19		0.19

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	16%
Maximum Green (s)	24.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	0.2
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	

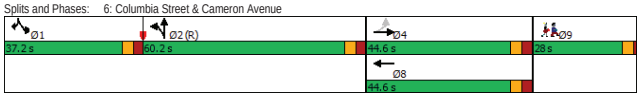
UNC DP TIA 2023 — Build (2030) PM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.58	0.42			1.10		0.54	1.10		0.51		1.04
Control Delay	64.8	13.2			133.3		52.7	112.9		68.8		117.7
Queue Delay	0.0	1.7			0.0		0.0	0.0		0.0		0.0
Total Delay	64.8	14.9			133.3		52.7	112.9		68.8		117.7
LOS	E	B			F		D	F		E		F
Approach Delay		20.7			133.3			99.3			106.5	
Approach LOS		C			F			F			F	
Queue Length 50th (ft)	12	70			~502		240	~553		150		~338
Queue Length 95th (ft)	m#61	106			#728		348	#697		230		#473
Internal Link Dist (ft)		296			2032			807			892	
Turn Bay Length (ft)	110									300		
Base Capacity (vph)	38	391			367		439	748		291		475
Starvation Cap Reductn	0	108			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		0
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.58	0.59			1.10		0.54	1.10		0.51		1.04

Intersection Summary

Area Type: CBD
Cycle Length: 170
Actuated Cycle Length: 170
Offset: 163 (96%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 100.8 — Intersection LOS: F
Intersection Capacity Utilization 82.9% — ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Columbia Street & Cameron Avenue



UNC DP TIA 2023 — Build (2030) PM
6: Columbia Street & Cameron Avenue — Lanes, Volumes, Timings

Lane Group	Ø9
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — Build (2030) PM
7: Raleigh Street & Cameron Avenue/Country Club Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	301	48	31	259	304	64	133	58	293	165	75
Future Volume (vph)	53	301	48	31	259	304	64	133	58	293	165	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	9	11	11	10	10	10	10	12	12
Storage Length (ft)	0		0	100		0	100		0	75		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25			25			100			50		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.91		0.70	0.89		0.86	0.86	
Frt		0.984			0.919			0.955			0.953	
Flt Protected		0.993		0.950			0.950			0.950		
Satd. Flow (prot)	0	1605	0	1433	1351	0	1486	1328	0	1486	1372	0
Flt Permitted		0.709		0.362			0.595			0.304		
Satd. Flow (perm)	0	1140	0	546	1351	0	648	1328	0	408	1372	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)					80			17			21	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		2112			312			770			994	
Travel Time (s)		57.6			8.5			21.0			27.1	
Confl. Peds. (#/hr)	42		40	40		42	112		86	86		112
Confl. Bikes (#/hr)			8			2			11			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	59	334	53	34	288	338	71	148	64	326	183	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	446	0	34	626	0	71	212	0	326	266	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.1	21.1		12.6	21.6		12.3	21.3		11.9	19.1	
Total Split (s)	49.4	49.4		12.6	62.0		12.4	23.0		25.0	35.6	
Total Split (%)	44.9%	44.9%		11.5%	56.4%		11.3%	20.9%		22.7%	32.4%	
Maximum Green (s)	43.3	43.3		7.0	56.4		7.1	17.7		20.1	30.5	
Yellow Time (s)	3.3	3.3		3.0	3.1		3.0	3.1		3.0	3.1	
All-Red Time (s)	2.8	2.8		2.6	2.5		2.3	2.2		1.9	2.0	
Lost Time Adjust (s)		-1.1		-0.6	-0.6		-0.3	-0.3		0.1	-0.1	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)	7.0	7.0			7.0			7.0			7.0	
Flash Dont Walk (s)	8.0	8.0			8.0			7.0			7.0	
Pedestrian Calls (#/hr)	0	0			0			0			0	
Act Effct Green (s)		47.4		55.0	55.0		25.2	17.9		45.0	35.1	
Actuated g/C Ratio		0.43		0.50	0.50		0.23	0.16		0.41	0.32	

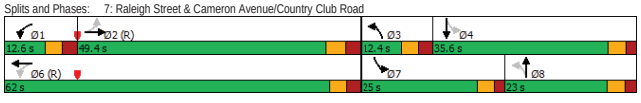
UNC DP TIA 2023 — Build (2030) PM
7: Raleigh Street & Cameron Avenue/Country Club Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.91		0.10	0.88		0.35	0.92		0.85	0.59	
Control Delay		55.1		13.3	31.1		33.5	89.8		46.2	32.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		55.1		13.3	31.1		33.5	89.8		46.2	32.2	
LOS		E		B	C		C	F		D	C	
Approach Delay		55.1			30.2			75.7			39.9	
Approach LOS		E			C			E			D	
Queue Length 50th (ft)		303		9	260		36	134		165	143	
Queue Length 95th (ft)		#517		m22	#557		70	#287		m#310	m228	
Internal Link Dist (ft)		2032			232			690			914	
Turn Bay Length (ft)				100			100			75		
Base Capacity (vph)		491		334	738		205	234		384	452	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.91		0.10	0.85		0.35	0.91		0.85	0.59	

Intersection Summary

Area Type: CBD
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 85 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 45.2 — Intersection LOS: D
Intersection Capacity Utilization 110.3% — ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Raleigh Street & Cameron Avenue/Country Club Road



UNC DP TIA 2023 — Build (2030) PM
8: Pittsboro Street & McCauley Street/South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	88	23	240	235	0	0	0	0	192	559	37
Future Volume (vph)	0	88	23	240	235	0	0	0	0	192	559	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	100		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			50			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor		0.95		0.82							0.94	
Frt		0.972									0.993	
Flt Protected				0.950							0.988	
Satd. Flow (prot)	0	1396	0	1593	1676	0	0	0	0	0	3080	0
Flt Permitted				0.677							0.988	
Satd. Flow (perm)	0	1396	0	925	1676	0	0	0	0	0	2938	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21									7	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1050			519			1147			237	
Travel Time (s)		28.6			14.2			31.3			6.5	
Confl. Peds. (#/hr)	86		112	112		86	101		67	67		101
Confl. Bikes (#/hr)			2			26			6			7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)		0	0									
Adj. Flow (vph)	0	98	26	267	261	0	0	0	0	213	621	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	124	0	267	261	0	0	0	0	0	875	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		22.8		23.6	23.6					23.3	23.3	
Total Split (s)		44.0		44.0	44.0					41.0	41.0	
Total Split (%)		51.8%		51.8%	51.8%					48.2%	48.2%	
Maximum Green (s)		39.2		38.4	38.4					35.7	35.7	
Yellow Time (s)		3.3		3.0	3.0					3.3	3.3	
All-Red Time (s)		1.5		2.6	2.6					2.0	2.0	
Lost Time Adjust (s)		-0.3		-0.3	-0.3						-0.1	
Total Lost Time (s)		4.5		5.3	5.3						5.2	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		Ped		Ped	Ped					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		6.0		7.0	7.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		30.7		29.9	29.9						44.6	
Actuated g/C Ratio		0.36		0.35	0.35						0.52	

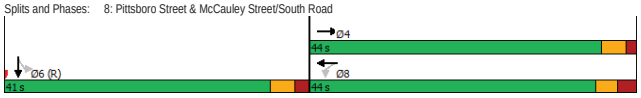
UNC DP TIA 2023 — Build (2030) PM
8: Pittsboro Street & McCauley Street/South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.24		0.82	0.44						0.57	
Control Delay		14.7		44.6	22.2						11.5	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		14.7		44.6	22.2						11.5	
LOS		B		D	C						B	
Approach Delay		14.7			33.5						11.5	
Approach LOS		B			C						B	
Queue Length 50th (ft)		37		125	103						144	
Queue Length 95th (ft)		63		196	143						276	
Internal Link Dist (ft)		970			439			1067			157	
Turn Bay Length (ft)				100								
Base Capacity (vph)		659		421	763						1546	
Starvation Cap Reductn		0		0	0						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.19		0.63	0.34						0.57	

Intersection Summary

Area Type: CBD
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 12 (14%), Referenced to phase 6:SBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 19.4 — Intersection LOS: B
Intersection Capacity Utilization 67.9% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 8: Pittsboro Street & McCauley Street/South Road



UNC DP TIA 2023 — Build (2030) PM
9: Columbia Street & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	323	0	0	434	238	137	701	135	0	0	0
Future Volume (vph)	59	323	0	0	434	238	137	701	135	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	13	13	12	11	11	11	11	11
Storage Length (ft)	75		0	0		125	0		0	0		0
Storage Lanes	1		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Ped Bike Factor	0.94				0.99	0.86		0.92				
Frt					0.992	0.850		0.979				
Flt Protected	0.950							0.993				
Satd. Flow (prot)	1593	1788	0	0	1621	1399	0	4054	0	0	0	0
Flt Permitted	0.950							0.993				
Satd. Flow (perm)	1500	1788	0	0	1621	1205	0	3942	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					5	91		56				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		519			696			500			887	
Travel Time (s)		14.2			19.0			13.6			24.2	
Confl. Peds. (#/hr)	105		109	109		105	105		203	203		105
Confl. Bikes (#/hr)			5			24			32			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	66	359	0	0	482	264	152	779	150	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	66	359	0	0	508	238	0	1081	0	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA				
Protected Phases	7	4			8			2				
Permitted Phases						8	2					
Detector Phase	7	4			8	8	2	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Minimum Split (s)	8.0	20.0			20.0	20.0	20.0	20.0				
Total Split (s)	8.0	36.0			28.0	28.0	24.0	24.0				
Total Split (%)	13.3%	60.0%			46.7%	46.7%	40.0%	40.0%				
Maximum Green (s)	4.0	32.0			24.0	24.0	20.0	20.0				
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5	3.5				
All-Red Time (s)	0.5	0.5			0.5	0.5	0.5	0.5				
Lost Time Adjust (s)	-0.6	-0.6			-0.5	-0.5		-0.9				
Total Lost Time (s)	3.4	3.4			3.5	3.5		3.1				
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Recall Mode	None	None			None	None	C-Max	C-Max				
Walk Time (s)		5.0			5.0	5.0	5.0	5.0				
Flash Dont Walk (s)		11.0			11.0	11.0	11.0	11.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	4.6	27.4			22.5	22.5		26.1				
Actuated g/C Ratio	0.08	0.46			0.38	0.38		0.44				

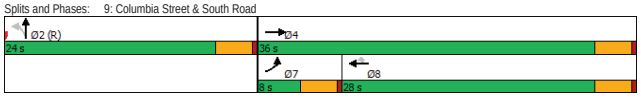
UNC DP TIA 2023 — Build (2030) PM
9: Columbia Street & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.54	0.44			0.83	0.47		0.62				
Control Delay	45.7	11.9			24.3	7.8		15.9				
Queue Delay	0.0	0.0			0.0	0.0		0.0				
Total Delay	45.7	11.9			24.3	7.8		15.9				
LOS	D	B			C	A		B				
Approach Delay		17.1			19.0			15.9				
Approach LOS		B			B			B				
Queue Length 50th (ft)	24	67			96	12		117				
Queue Length 95th (ft)	#72	115			#297	m49		164				
Internal Link Dist (ft)		439			616			420			807	
Turn Bay Length (ft)	75					125						
Base Capacity (vph)	122	971			664	545		1746				
Starvation Cap Reductn	0	0			0	0		0				
Spillback Cap Reductn	0	0			0	0		0				
Storage Cap Reductn	0	0			0	0		0				
Reduced v/c Ratio	0.54	0.37			0.77	0.44		0.62				

Intersection Summary

Area Type: CBD
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 27 (45%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 17.2 — Intersection LOS: B
Intersection Capacity Utilization 67.9% — ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Columbia Street & South Road



UNC DP TIA 2023 — Build (2030) PM
10: South Road & Raleigh Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	91	314	300	89	75	147
Future Volume (vph)	91	314	300	89	75	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	11	11
Storage Length (ft)	225			190	75	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.92			0.83	0.62	0.47
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	1676	1621	1378	1540	1378
Flt Permitted	0.542				0.950	
Satd. Flow (perm)	838	1676	1621	1141	951	644
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				99		163
Link Speed (mph)		25	25		25	
Link Distance (ft)		516	1148		454	
Travel Time (s)		14.1	31.3		12.4	
Confl. Peds. (#/hr)	63			63	132	209
Confl. Bikes (#/hr)				6		4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	101	349	333	99	83	163
Shared Lane Traffic (%)						
Lane Group Flow (vph)	101	349	333	99	83	163
Turn Type	D.P+P	NA	NA	Perm	Prot	pm+ov
Protected Phases	5	2	6		4	5
Permitted Phases	6			6		4
Detector Phase	5	2	6	6	4	5
Switch Phase						
Minimum Initial (s)	7.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	12.6	15.8	28.8	28.8	24.8	12.6
Total Split (s)	24.0	80.0	56.0	56.0	30.0	24.0
Total Split (%)	21.8%	72.7%	50.9%	50.9%	27.3%	21.8%
Maximum Green (s)	18.4	74.2	50.2	50.2	24.2	18.4
Yellow Time (s)	3.0	3.2	3.2	3.2	3.0	3.0
All-Red Time (s)	2.6	2.6	2.6	2.6	2.8	2.6
Lost Time Adjust (s)	-0.6	-0.7	-0.8	-0.8	-0.6	-0.6
Total Lost Time (s)	5.0	5.1	5.0	5.0	5.2	5.0
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?						
Vehicle Extension (s)	1.0	3.0	1.0	1.0	2.0	1.0
Recall Mode	None	C-Min	Min	Min	None	None
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			16.0	16.0	12.0	
Pedestrian Calls (#/hr)			0	0	0	
Act Effct Green (s)	86.2	92.1	78.6	78.6	11.2	17.4
Actuated g/C Ratio	0.78	0.84	0.71	0.71	0.10	0.16

UNC DP TIA 2023 — Build (2030) PM
10: South Road & Raleigh Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
v/c Ratio	0.14	0.25	0.29	0.12	0.53	0.56
Control Delay	3.1	3.2	4.1	0.4	46.4	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	3.2	4.1	0.4	46.4	9.1
LOS	A	A	A	A	D	A
Approach Delay		3.2	3.2		21.7	
Approach LOS		A	A		C	
Queue Length 50th (ft)	11	47	40	0	39	0
Queue Length 95th (ft)	27	92	50	m1	m67	m16
Internal Link Dist (ft)		436	1068		374	
Turn Bay Length (ft)	225			190	75	
Base Capacity (vph)	825	1402	1157	843	347	415
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.25	0.29	0.12	0.24	0.39

Intersection Summary

Area Type: CBD
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 29 (26%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 7.2 — Intersection LOS: A
Intersection Capacity Utilization 53.3% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: South Road & Raleigh Street



UNC DP TIA 2023 — Build (2030) PM
11: Country Club Road & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	376	40	254	346	546	22	118	382	545	101	13
Future Volume (vph)	29	376	40	254	346	546	22	118	382	545	101	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	14	12	12	14	12	15	12	11	16	12
Storage Length (ft)	0		0	200		0	0		0	75		0
Storage Lanes	1		0	1		1	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor	0.96	0.99		0.98		0.93		1.00	0.99	1.00	1.00	
Frt		0.986				0.850			0.850		0.994	
Flt Protected	0.950			0.950				0.992		0.950	0.968	
Satd. Flow (prot)	1711	3461	0	1770	1863	1689	0	2033	1583	1625	1926	0
Flt Permitted	0.534			0.295				0.992		0.950	0.968	
Satd. Flow (perm)	924	3461	0	537	1863	1576	0	2025	1560	1624	1925	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				127			100		2	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		362			1042			215			421	
Travel Time (s)		9.9			28.4			4.2			11.5	
Confl. Peds. (#/hr)	30		27	27		30	45		1	1		45
Confl. Bikes (#/hr)			9			1			1			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	32	418	44	282	384	607	24	131	424	606	112	14
Shared Lane Traffic (%)										40%		
Lane Group Flow (vph)	32	462	0	282	384	607	0	155	424	364	368	0
Turn Type	Perm	NA		pm+pt	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases		2		1	6	4	3	3	1	4	4	
Permitted Phases	2			6		6		3	3			
Detector Phase	2	2		1	6	4	3	3	1	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0	7.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	33.1	33.1		12.1	31.1	42.0	13.6	13.6	12.1	42.0	42.0	
Total Split (s)	33.5	33.5		20.2	53.7	42.0	14.3	14.3	20.2	42.0	42.0	
Total Split (%)	30.5%	30.5%		18.4%	48.8%	38.2%	13.0%	13.0%	18.4%	38.2%	38.2%	
Maximum Green (s)	27.4	27.4		15.1	47.6	35.0	7.7	7.7	15.1	35.0	35.0	
Yellow Time (s)	3.7	3.7		3.0	3.7	3.1	3.3	3.3	3.0	3.1	3.1	
All-Red Time (s)	2.4	2.4		2.1	2.4	3.9	3.3	3.3	2.1	3.9	3.9	
Lost Time Adjust (s)	-0.7	-0.7		-0.1	-0.6	-1.7		-1.3	-0.1	-1.7	-1.7	
Total Lost Time (s)	5.4	5.4		5.0	5.5	5.3		5.3	5.0	5.3	5.3	
Lead/Lag	Lag	Lag		Lead		Lag	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?						Yes				Yes	Yes	
Vehicle Extension (s)	3.0	3.0		1.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	
Recall Mode	C-Min	C-Min		None	C-Min	None	None	None	None	None	None	
Walk Time (s)	7.0	7.0			7.0	7.0				7.0	7.0	
Flash Dont Walk (s)	20.0	20.0			18.0	28.0				28.0	28.0	
Pedestrian Calls (#/hr)	0	0			0	0				0	0	
Act Effct Green (s)	27.4	27.4		51.5	51.0	81.2		12.9	31.8	30.1	30.1	
Actuated g/C Ratio	0.25	0.25		0.47	0.46	0.74		0.12	0.29	0.27	0.27	

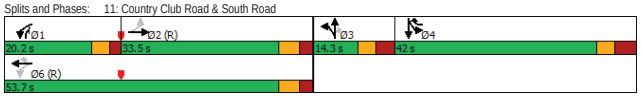
UNC DP TIA 2023 — Build (2030) PM
11: Country Club Road & South Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.14	0.53		0.61	0.44	0.49		0.65	0.81	0.82	0.70	
Control Delay	30.9	32.5		26.9	23.5	4.6		60.5	28.9	42.6	33.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.5	0.7	
Total Delay	30.9	32.5		26.9	23.5	4.6		60.5	28.9	43.1	34.3	
LOS	C	C		C	C	A		E	C	D	C	
Approach Delay		32.4			15.2			37.3			38.7	
Approach LOS		C			B			D			D	
Queue Length 50th (ft)	18	145		129	188	94		104	103	235	230	
Queue Length 95th (ft)	39	173		203	283	115		#210	#304	252	210	
Internal Link Dist (ft)		282			962			135			341	
Turn Bay Length (ft)				200						75		
Base Capacity (vph)	254	957		460	881	1280		237	525	542	643	
Starvation Cap Reductn	0	0		0	0	0		0	0	28	82	
Spillback Cap Reductn	0	0		0	0	3		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.13	0.48		0.61	0.44	0.48		0.65	0.81	0.71	0.66	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 17 (15%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 27.7 — Intersection LOS: C
Intersection Capacity Utilization 86.1% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Country Club Road & South Road



UNC DP TIA 2023 — Build (2030) PM
12: Columbia Street & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	179	0	213	0	461	0	396	67	0	0	0
Future Volume (vph)	126	179	0	213	0	461	0	396	67	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			4%			-4%			0%	
Storage Length (ft)	100		0	0		0	100		150	0		0
Storage Lanes	1		0	1		2	1		1	0		0
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.96			0.95		0.80			0.98			
Frt						0.850			0.850			
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1778	3557	0	1734	0	2731	0	3610	1615	0	0	0
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	1700	3557	0	1649	0	2173	0	3610	1578	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	139					512			74			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		218			284			267			526	
Travel Time (s)		5.9			7.7			7.3			14.3	
Confl. Peds. (#/hr)	43		37	37		43	21		11	11		21
Confl. Bikes (#/hr)			15			11			3			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	140	199	0	237	0	512	0	440	74	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	199	0	237	0	512	0	440	74	0	0	0
Turn Type	Prot	NA		Prot		Perm		NA	pm+ov			
Protected Phases	7	4		3				2	3			
Permitted Phases						3		2	2			
Detector Phase	7	4		3		3		2	3			
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0		7.0		10.0	7.0			
Minimum Split (s)	11.9	25.6		12.9		12.9		30.0	12.9			
Total Split (s)	25.6	25.6		14.3		14.3		30.1	14.3			
Total Split (%)	36.6%	36.6%		20.4%		20.4%		43.0%	20.4%			
Maximum Green (s)	20.7	20.0		8.4		8.4		24.1	8.4			
Yellow Time (s)	3.0	3.2		3.0		3.0		3.4	3.0			
All-Red Time (s)	1.9	2.4		2.9		2.9		2.6	2.9			
Lost Time Adjust (s)	0.1	-0.6		-0.9		-0.9		-1.0	-0.9			
Total Lost Time (s)	5.0	5.0		5.0		5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0		1.0		3.0	1.0			
Recall Mode	None	None		None		None		Min	None			
Walk Time (s)		4.0						4.0				
Flash Dont Walk (s)		16.0						20.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)	7.7	7.8		9.3		9.3		12.2	21.6			
Actuated g/C Ratio	0.17	0.18		0.21		0.21		0.27	0.49			

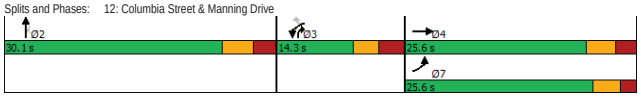
UNC DP TIA 2023 — Build (2030) PM
12: Columbia Street & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.33	0.32		0.65		0.60		0.44	0.09			
Control Delay	6.8	18.0		28.3		5.5		14.8	1.6			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	6.8	18.0		28.3		5.5		14.8	1.6			
LOS	A	B		C		A		B	A			
Approach Delay		13.4			12.7			12.9				
Approach LOS		B			B			B				
Queue Length 50th (ft)	0	23		53		0		47	0			
Queue Length 95th (ft)	35	48		#150		34		80	10			
Internal Link Dist (ft)		138			204			187			446	
Turn Bay Length (ft)	100								150			
Base Capacity (vph)	901	1655		364		860		2046	811			
Starvation Cap Reductn	0	0		0		0		0	0			
Spillback Cap Reductn	0	0		0		0		0	0			
Storage Cap Reductn	0	0		0		0		0	0			
Reduced v/c Ratio	0.16	0.12		0.65		0.60		0.22	0.09			

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 44.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 12.9 — Intersection LOS: B
Intersection Capacity Utilization 52.9% — ICU Level of Service A
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Columbia Street & Manning Drive



UNC DP TIA 2023 — Build (2030) PM
13: West Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	211	19	98	595	67	53	1	14	6	5	27
Future Volume (vph)	76	211	19	98	595	67	53	1	14	6	5	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			3%			0%			-3%	
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.97			0.98			0.96	0.99
Frt		0.991			0.987			0.972				0.850
Flt Protected		0.988			0.994			0.963			0.974	
Satd. Flow (prot)	0	3470	0	0	3414	0	0	1705	0	0	1842	1607
Flt Permitted		0.672			0.837			0.766			0.859	
Satd. Flow (perm)	0	2360	0	0	2806	0	0	1356	0	0	1552	1586
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			20			13				80
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		388			334			349			293	
Travel Time (s)		7.6			6.5			9.5			8.0	
Confl. Peds. (#/hr)			107	107					66	66		
Confl. Bikes (#/hr)			7			2			1			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	84	234	21	109	661	74	59	1	16	7	6	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	339	0	0	844	0	0	76	0	0	13	30
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	2	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	20.4	20.4		11.9	23.9		26.7	26.7		28.5	28.5	28.5
Total Split (s)	57.0	57.0		12.0	69.0		31.0	31.0		31.0	31.0	31.0
Total Split (%)	57.0%	57.0%		12.0%	69.0%		31.0%	31.0%		31.0%	31.0%	31.0%
Maximum Green (s)	51.6	51.6		7.1	64.1		25.3	25.3		25.5	25.5	25.5
Yellow Time (s)	3.5	3.5		3.0	3.1		3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	1.9	1.9		1.9	1.8		2.4	2.4		2.2	2.2	2.2
Lost Time Adjust (s)		-0.4			0.1			-0.7			-0.5	-0.5
Total Lost Time (s)		5.0			5.0			5.0			5.0	5.0
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		1.0	2.0		1.0	1.0		1.0	1.0	1.0
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	8.0	8.0			12.0		14.0	14.0		16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	0
Act Effct Green (s)		83.9			83.9			9.7			9.6	9.6
Actuated g/C Ratio		0.84			0.84			0.10			0.10	0.10
v/c Ratio		0.17			0.36			0.54			0.09	0.13
Control Delay		2.4			2.4			45.2			40.8	1.2
Queue Delay		0.0			0.1			0.0			0.0	0.0

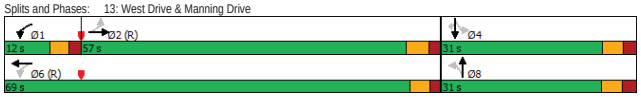
UNC DP TIA 2023 — Build (2030) PM
13: West Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		2.4			2.6			45.2			40.8	1.2
LOS		A			A			D			D	A
Approach Delay		2.4			2.6			45.2			13.2	
Approach LOS		A			A			D			B	
Queue Length 50th (ft)		17			54			40			8	0
Queue Length 95th (ft)		36			68			69			25	0
Internal Link Dist (ft)		308			254			269			213	
Turn Bay Length (ft)												
Base Capacity (vph)		1980			2356			362			403	471
Starvation Cap Reductn		0			501			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.17			0.45			0.21			0.03	0.06

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 57 (57%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 5.4 — Intersection LOS: A
Intersection Capacity Utilization 63.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 13: West Drive & Manning Drive



UNC DP TIA 2023 — Build (2030) PM
14: East Drive/Hospital Entrance & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	382	51	84	507	46	105	34	452	0	0	0
Future Volume (vph)	31	382	51	84	507	46	105	34	452	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		-4%			3%			-4%			0%	
Storage Length (ft)	150		0	100		0	100		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93	0.96		0.88	0.98				0.93			
Frt		0.982			0.988				0.850			
Flt Protected	0.950			0.950				0.964				
Satd. Flow (prot)	1685	3189	0	1627	3160	0	0	1709	1507	0	0	0
Flt Permitted	0.408			0.442				0.964				
Satd. Flow (perm)	672	3189	0	666	3160	0	0	1709	1409	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			14				42			
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		382			469			315			391	
Travel Time (s)		7.4			9.1			8.6			10.7	
Confl. Peds. (#/hr)	124		109	109		124			40	40		
Confl. Bikes (#/hr)			3									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	34	424	57	93	563	51	117	38	502	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	481	0	93	614	0	0	155	502	0	0	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov			
Protected Phases	5	2		1	6			8	1			
Permitted Phases	6			2			8		8			
Detector Phase	5	2		1	6		8	8	1			
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		7.0	7.0	5.0			
Minimum Split (s)	12.4	25.0		12.4	24.6		27.8	27.8	12.4			
Total Split (s)	13.0	32.0		39.0	58.0		29.0	29.0	39.0			
Total Split (%)	13.0%	32.0%		39.0%	58.0%		29.0%	29.0%	39.0%			
Maximum Green (s)	7.9	26.0		33.6	52.4		23.2	23.2	33.6			
Yellow Time (s)	3.0	3.4		3.0	3.1		3.4	3.4	3.0			
All-Red Time (s)	2.1	2.6		2.4	2.5		2.4	2.4	2.4			
Lost Time Adjust (s)	-0.4	-0.9		-0.4	-0.6			-1.2	-0.4			
Total Lost Time (s)	4.7	5.1		5.0	5.0			4.6	5.0			
Lead/Lag	Lead	Lag		Lead	Lag				Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	1.0	1.0			
Recall Mode	None	C-Min		None	C-Min		None	None	None			
Walk Time (s)		7.0			7.0		7.0	7.0				
Flash Dont Walk (s)		12.0			12.0		15.0	15.0				
Pedestrian Calls (#/hr)		0			0		0	0				
Act Effct Green (s)	74.1	47.5		71.7	70.6			13.7	37.4			

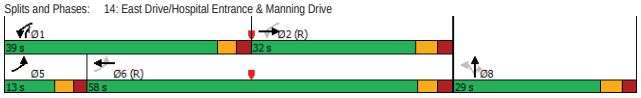
UNC DP TIA 2023 — Build (2030) PM
14: East Drive/Hospital Entrance & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.74	0.48		0.72	0.71			0.14	0.37			
v/c Ratio	0.06	0.32		0.13	0.27			0.66	0.87			
Control Delay	1.9	14.2		3.4	4.1			53.2	37.3			
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0			
Total Delay	1.9	14.2		3.4	4.1			53.2	37.3			
LOS	A	B		A	A			D	D			
Approach Delay		13.4			4.0			41.0				
Approach LOS		B			A			D				
Queue Length 50th (ft)	2	108		7	36			82	246			
Queue Length 95th (ft)	6	203		23	64			143	149			
Internal Link Dist (ft)		302			389			235			311	
Turn Bay Length (ft)	150			100								
Base Capacity (vph)	593	1522		834	2235			416	728			
Starvation Cap Reductn	0	0		0	0			0	0			
Spillback Cap Reductn	0	0		0	0			0	0			
Storage Cap Reductn	0	0		0	0			0	0			
Reduced v/c Ratio	0.06	0.32		0.11	0.27			0.37	0.69			

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 62 (62%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 19.5 — Intersection LOS: B
Intersection Capacity Utilization 55.6% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 14: East Drive/Hospital Entrance & Manning Drive



UNC DP TIA 2023 — Build (2030) PM
15: Skipper Bowles Drive/Ridge Road & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	291	853	57	12	219	63	126	107	38	106	57	230
Future Volume (vph)	291	853	57	12	219	63	126	107	38	106	57	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	10	11	12	10	12	12	12	12	12
Grade (%)		-2%			6%			12%			2%	
Storage Length (ft)	100		0	100		0	0		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			0.99		1.00					0.98
Frt		0.991			0.966			0.961				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	3422	0	1602	3189	0	1553	1683	0	1752	1844	1567
Flt Permitted	0.950			0.950			0.716			0.517		
Satd. Flow (perm)	1665	3422	0	1602	3189	0	1168	1683	0	953	1844	1544
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			39			18				256
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		348			791			579			293	
Travel Time (s)		9.5			21.6			15.8			8.0	
Confl. Peds. (#/hr)	2					2	2					2
Confl. Bikes (#/hr)			2									2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	323	948	63	13	243	70	140	119	42	118	63	256
Shared Lane Traffic (%)												
Lane Group Flow (vph)	323	1011	0	13	313	0	140	161	0	118	63	256
Turn Type	Prot	NA		Prot	NA		D.P+P	NA		D.P+P	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases							4			8		4
Detector Phase	5	2		1	6		3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		4.0	7.0		7.0	7.0	7.0
Minimum Split (s)	12.9	35.2		12.8	37.0		8.0	34.3		13.0	33.0	12.9
Total Split (s)	15.0	39.9		12.8	37.7		9.0	34.3		13.0	38.3	15.0
Total Split (%)	15.0%	39.9%		12.8%	37.7%		9.0%	34.3%		13.0%	38.3%	15.0%
Maximum Green (s)	9.4	33.7		7.4	31.7		5.0	28.0		7.0	32.3	9.4
Yellow Time (s)	3.0	3.3		3.0	3.0		3.5	3.0		3.0	3.1	3.0
All-Red Time (s)	2.6	2.9		2.4	3.0		0.5	3.3		3.0	2.9	2.6
Lost Time Adjust (s)	-0.9	-1.3		-0.8	-1.1		-1.2	-1.2		-0.9	-0.9	-0.9
Total Lost Time (s)	4.7	4.9		4.6	4.9		2.8	5.1		5.1	5.1	4.7
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	2.0	3.0		2.0	2.0		3.0	2.0		2.0	2.0	2.0
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			24.0			21.0			20.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	32.1	59.0		7.8	24.6		28.6	14.2		23.4	15.6	46.4

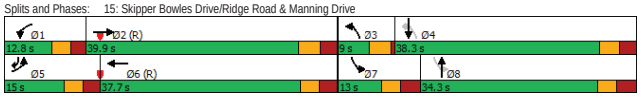
UNC DP TIA 2023 — Build (2030) PM
15: Skipper Bowles Drive/Ridge Road & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.32	0.59		0.08	0.25		0.29	0.14		0.23	0.16	0.46
v/c Ratio	0.60	0.50		0.10	0.38		0.37	0.63		0.40	0.22	0.30
Control Delay	35.7	8.5		45.0	27.5		29.2	47.1		30.5	35.9	2.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	35.7	8.5		45.0	27.5		29.2	47.1		30.5	35.9	2.8
LOS	D	A		D	C		C	D		C	D	A
Approach Delay		15.0			28.2			38.8			15.1	
Approach LOS		B			C			D			B	
Queue Length 50th (ft)	137	77		8	76		67	86		57	36	0
Queue Length 95th (ft)	#373	348		27	102		112	145		97	66	40
Internal Link Dist (ft)		268			711			499			213	
Turn Bay Length (ft)	100			100								100
Base Capacity (vph)	535	2021		131	1072		383	504		297	612	861
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.60	0.50		0.10	0.29		0.37	0.32		0.40	0.10	0.30

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 78 (78%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 19.8 — Intersection LOS: B
Intersection Capacity Utilization 72.3% — ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Skipper Bowles Drive/Ridge Road & Manning Drive



UNC DP TIA 2023 — Build (2030) PM
16: Columbia Street & Westwood Drive/Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	6	536	7	128	20	412	114	102	744	9
Future Volume (vph)	1	0	6	536	7	128	20	412	114	102	744	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-1%			-3%			-3%			4%	
Storage Length (ft)	0		0	0		250	150		200	0		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.84			0.85	0.86			0.96		1.00	
Frt		0.882				0.850			0.850		0.998	
Flt Protected		0.994			0.953		0.950			0.950		
Satd. Flow (prot)	0	1392	0	0	1742	1554	1796	1891	1714	1676	1760	0
Flt Permitted		0.994			0.953		0.070			0.286		
Satd. Flow (perm)	0	1384	0	0	1479	1344	132	1891	1644	505	1760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		107				101			127		1	
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		283			749			309			956	
Travel Time (s)		6.4			20.4			8.4			26.1	
Confl. Peds. (#/hr)	38		47	47		38	66		8	8		6
Confl. Bikes (#/hr)			1			16						14
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1	0	7	596	8	142	22	458	127	113	827	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	604	142	22	458	127	113	837	0
Turn Type	Split	NA		Split	NA	pm+ov	D.Pm	NA	pm+ov	D.P+P	NA	
Protected Phases	4	4		3	3	1		2	3	1	6	
Permitted Phases						3	6		2	2		
Detector Phase	4	4		3	3	1	6	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	10.0	10.0	7.0	7.0	10.0	
Minimum Split (s)	28.3	28.3		33.4	33.4	11.9	16.9	30.9	33.4	11.9	16.9	
Total Split (s)	28.3	28.3		50.0	50.0	12.6	66.7	54.1	50.0	12.6	66.7	
Total Split (%)	19.5%	19.5%		34.5%	34.5%	8.7%	46.0%	37.3%	34.5%	8.7%	46.0%	
Maximum Green (s)	22.0	22.0		43.6	43.6	7.7	60.8	48.2	43.6	7.7	60.8	
Yellow Time (s)	3.3	3.3		3.5	3.5	3.1	3.6	3.6	3.5	3.1	3.6	
All-Red Time (s)	3.0	3.0		2.9	2.9	1.8	2.3	2.3	2.9	1.8	2.3	
Lost Time Adjust (s)		-1.3			-1.4	0.1	-0.9	-0.9	-1.4	0.1	-0.9	
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead		Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min	None	None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	
Flash Dont Walk (s)	18.0	18.0		23.0	23.0		7.0	21.0	23.0		7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0		0	
Act Effct Green (s)		8.3			45.1	52.5	61.8	49.4	94.5	56.8	61.8	

Build (2030) PM.syn — VHB

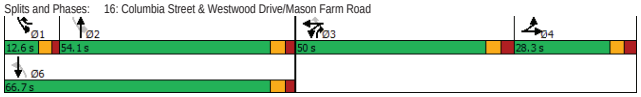
UNC DP TIA 2023 — Build (2030) PM
16: Columbia Street & Westwood Drive/Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.07			0.38	0.44	0.52	0.41	0.79	0.48	0.52	
v/c Ratio		0.04			0.92	0.22	0.32	0.59	0.09	0.36	0.92	
Control Delay		0.4			56.5	6.3	35.1	31.6	0.7	19.5	43.3	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		0.4			56.5	6.3	35.1	31.6	0.7	19.5	43.3	
LOS		A			E	A	D	C	A	B	D	
Approach Delay		0.4			46.9			25.3			40.5	
Approach LOS		A			D			C			D	
Queue Length 50th (ft)		0			422	16	9	259	0	41	543	
Queue Length 95th (ft)		0			#759	48	43	434	14	90	#984	
Internal Link Dist (ft)		203			669			229			876	
Turn Bay Length (ft)						250	150		200			
Base Capacity (vph)		358			657	662	68	782	1354	315	911	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.02			0.92	0.21	0.32	0.59	0.09	0.36	0.92	

Intersection Summary

Area Type: Other
Cycle Length: 145
Actuated Cycle Length: 119.4
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 38.4 — Intersection LOS: D
Intersection Capacity Utilization 97.3% — ICU Level of Service F
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 16: Columbia Street & Westwood Drive/Mason Farm Road



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
17: West Drive & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	234	8	4	459	49	0	0	0	24	0	96
Future Volume (vph)	9	234	8	4	459	49	0	0	0	24	0	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			4%			0%			1%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.97						0.88	
Frt		0.996			0.987						0.892	
Flt Protected		0.998									0.990	
Satd. Flow (prot)	0	1850	0	0	1752	0	0	0	0	0	1511	0
Flt Permitted		0.981			0.998						0.990	
Satd. Flow (perm)	0	1813	0	0	1745	0	0	0	0	0	1436	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			11						107	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		344			481			500			293	
Travel Time (s)		9.4			13.1			11.4			8.0	
Confl. Peds. (#/hr)	88		123	123		88	31		99	99		31
Confl. Bikes (#/hr)			3			2						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	260	9	4	510	54	0	0	0	27	0	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	279	0	0	568	0	0	0	0	0	134	0
Turn Type	Perm	NA		Perm	NA					Perm	NA	
Protected Phases		2			6						4	
Permitted Phases	2			6						4		
Detector Phase	2	2		6	6					4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0					7.0	7.0	
Minimum Split (s)	23.0	23.0		23.8	23.8					25.6	25.6	
Total Split (s)	69.0	69.0		69.0	69.0					31.0	31.0	
Total Split (%)	69.0%	69.0%		69.0%	69.0%					31.0%	31.0%	
Maximum Green (s)	64.0	64.0		63.2	63.2					25.4	25.4	
Yellow Time (s)	3.5	3.5		3.0	3.0					3.2	3.2	
All-Red Time (s)	1.5	1.5		2.8	2.8					2.4	2.4	
Lost Time Adjust (s)		0.0			-0.9						-0.2	
Total Lost Time (s)		5.0			4.9						5.4	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0					2.0	2.0	
Recall Mode	C-Min	C-Min		Min	Min					None	None	
Walk Time (s)	7.0	7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)	6.0	6.0		9.0	9.0					13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0					0	0	
Act Effct Green (s)		80.8			80.9						8.8	
Actuated g/C Ratio		0.81			0.81						0.09	
v/c Ratio		0.19			0.40						0.60	
Control Delay		2.7			4.0						17.4	
Queue Delay		0.0			0.4						0.0	

Build (2030) PM.syn — VHB

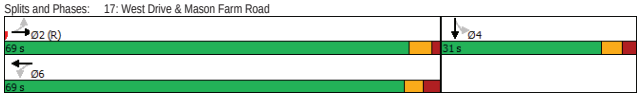
UNC DP TIA 2023 — Build (2030) PM
17: West Drive & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		2.7			4.4						17.4	
LOS		A			A						B	
Approach Delay		2.7			4.4						17.4	
Approach LOS		A			A						B	
Queue Length 50th (ft)		26			99						1	
Queue Length 95th (ft)		62			173						38	
Internal Link Dist (ft)		264			401			420			213	
Turn Bay Length (ft)												
Base Capacity (vph)		1464			1413						447	
Starvation Cap Reductn		0			396						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.19			0.56						0.30	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 42 (42%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 5.7 — Intersection LOS: A
Intersection Capacity Utilization 54.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 17: West Drive & Mason Farm Road



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
18: Mason Farm Road & East Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	289	91	95	214	11	83	3	27	0	0	0
Future Volume (vph)	18	289	91	95	214	11	83	3	27	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			0%	
Storage Length (ft)	50		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.91	0.93		0.89	0.99			0.92				
Frt		0.964			0.993			0.968				
Flt Protected	0.950			0.950				0.965				
Satd. Flow (prot)	1770	1667	0	1770	1836	0	0	1649	0	0	0	0
Flt Permitted	0.604			0.445				0.965				
Satd. Flow (perm)	1021	1667	0	737	1836	0	0	1566	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			3			14				
Link Speed (mph)		25			25			25			30	
Link Distance (ft)		481			155			560			76	
Travel Time (s)		13.1			4.2			15.3			1.7	
Confl. Peds. (#/hr)	70		135	135		70	26		37	37		16
Confl. Bikes (#/hr)			7			2			1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	20	321	101	106	238	12	92	3	30	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	422	0	106	250	0	0	125	0	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA				
Protected Phases	5	2		1	6		8	8				
Permitted Phases	2			6								
Detector Phase	5	2		1	6		8	8				
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0				
Minimum Split (s)	29.1	29.3		29.8	19.3		24.3	24.3				
Total Split (s)	29.1	45.4		30.0	46.3		24.6	24.6				
Total Split (%)	29.1%	45.4%		30.0%	46.3%		24.6%	24.6%				
Maximum Green (s)	25.0	40.1		25.2	41.0		19.3	19.3				
Yellow Time (s)	3.0	3.2		3.0	3.2		3.0	3.0				
All-Red Time (s)	1.1	2.1		1.8	2.1		2.3	2.3				
Lost Time Adjust (s)	0.9	-0.2		0.4	-0.2			-0.4				
Total Lost Time (s)	5.0	5.1		5.2	5.1			4.9				
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	1.0				
Recall Mode	None	C-Min		None	C-Min		None	None				
Walk Time (s)	5.0	7.0		5.0	7.0		7.0	7.0				
Flash Dont Walk (s)	20.0	17.0		20.0	7.0		12.0	12.0				
Pedestrian Calls (#/hr)	0	0		0	0		0	0				
Act Effct Green (s)	73.4	67.2		77.1	74.5			11.0				
Actuated g/C Ratio	0.73	0.67		0.77	0.74			0.11				

UNC DP TIA 2023 — Build (2030) PM
18: Mason Farm Road & East Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.03	0.38		0.17	0.18			0.64				
Control Delay	3.1	8.2		3.1	4.8			52.5				
Queue Delay	0.0	0.3		0.0	0.0			0.0				
Total Delay	3.1	8.5		3.1	4.8			52.5				
LOS	A	A		A	A			D				
Approach Delay		8.3			4.3			52.5				
Approach LOS		A			A			D				
Queue Length 50th (ft)	2	95		10	24			69				
Queue Length 95th (ft)	8	163		24	88			122				
Internal Link Dist (ft)		401			75			480			1	
Turn Bay Length (ft)	50			100								
Base Capacity (vph)	987	1125		837	1368			336				
Starvation Cap Reductn	0	274		0	0			0				
Spillback Cap Reductn	0	0		0	0			0				
Storage Cap Reductn	0	0		0	0			0				
Reduced v/c Ratio	0.02	0.50		0.13	0.18			0.37				

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 11 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 12.7 — Intersection LOS: B
Intersection Capacity Utilization 56.1% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 18: Mason Farm Road & East Drive



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
19: Mason Farm Road & Purefoy Road — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	39	14	55	294	0
Future Volume (vph)	0	39	14	55	294	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected				0.990		
Satd. Flow (prot)	1611	0	0	1844	1863	0
Flt Permitted				0.990		
Satd. Flow (perm)	1611	0	0	1844	1863	0
Link Speed (mph)	25			30	30	
Link Distance (ft)	563			318	480	
Travel Time (s)	15.4			7.2	10.9	
Confl. Peds. (#/hr)	15	22	7			7
Confl. Bikes (#/hr)		2				15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	43	16	61	327	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	77	327	0
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 31.2% — ICU Level of Service A
Analysis Period (min) 15

Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
19: Mason Farm Road & Purefoy Road — HCM 2010 AWSC

Intersection

Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	39	14	55	294	0
Future Vol, veh/h	0	39	14	55	294	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	43	16	61	327	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.4	7.8	9.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	20%	0%	0%
Vol Thru, %	80%	0%	100%
Vol Right, %	0%	100%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	69	39	294
LT Vol	14	0	0
Through Vol	55	0	294
RT Vol	0	39	0
Lane Flow Rate	77	43	327
Geometry Grp	1	1	1
Degree of Util (X)	0.092	0.051	0.369
Departure Headway (Hd)	4.298	4.207	4.069
Convergence, Y/N	Yes	Yes	Yes
Cap	821	856	879
Service Time	2.391	2.207	2.113
HCM Lane V/C Ratio	0.094	0.05	0.372
HCM Control Delay	7.8	7.4	9.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	0.2	1.7

Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
20: Skipper Bowles Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	982	12	67	258	17	188
Future Volume (vph)	982	12	67	258	17	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.998					0.850
Flt Protected				0.990	0.950	
Satd. Flow (prot)	3532	0	0	3504	1770	1583
Flt Permitted				0.990	0.950	
Satd. Flow (perm)	3532	0	0	3504	1770	1583
Link Speed (mph)	35			35	35	
Link Distance (ft)	336			902	340	
Travel Time (s)	6.5			17.6	6.6	
Confl. Peds. (#/hr)		16	16			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1091	13	74	287	19	209
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1104	0	0	361	19	209
Sign Control	Free			Free	Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 50.0% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
20: Skipper Bowles Drive & Manning Drive — HCM 2010 TWSC

Intersection
Int Delay, s/veh 3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	982	12	67	258	17	188
Future Vol, veh/h	982	12	67	258	17	188
Conflicting Peds, #/hr	0	16	16	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1091	13	74	287	19	209

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1120	0	1406	568
Stage 1	-	-	-	-	1114	-
Stage 2	-	-	-	-	292	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	619	-	130	466
Stage 1	-	-	-	-	276	-
Stage 2	-	-	-	-	732	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	611	-	110	460
Mov Cap-2 Maneuver	-	-	-	-	110	-
Stage 1	-	-	-	-	272	-
Stage 2	-	-	-	-	627	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	21.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	110	460	-	-	611	-
HCM Lane V/C Ratio	0.172	0.454	-	-	0.122	-
HCM Control Delay (s)	44.4	19.2	-	-	11.7	0.6
HCM Lane LOS	E	C	-	-	B	A
HCM 95th %tile Q(veh)	0.6	2.3	-	-	0.4	-

UNC DP TIA 2023 — Build (2030) PM
21: Columbia Street & Purefoy Road — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	27	441	0	11	1254
Future Volume (vph)	0	27	441	0	11	1254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	250	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected					0.950	
Satd. Flow (prot)	1611	0	1863	0	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1611	0	1863	0	1770	1863
Link Speed (mph)	25		25			25
Link Distance (ft)	654		109			397
Travel Time (s)	17.8		3.0			10.8
Confl. Peds. (#/hr)	12			3	3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	30	490	0	12	1393
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	0	490	0	12	1393
Sign Control	Stop		Free			Free

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 76.0% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
21: Columbia Street & Purefoy Road — HCM 2010 TWSC

Intersection
Int Delay, s/veh 0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	27	441	0	11	1254
Future Vol, veh/h	0	27	441	0	11	1254
Conflicting Peds, #/hr	12	0	0	3	3	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	250	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	30	490	0	12	1393

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1922	493	0	-	493	0
Stage 1	493	-	-	-	-	-
Stage 2	1429	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	74	576	-	0	1071	-
Stage 1	614	-	-	0	-	-
Stage 2	221	-	-	0	-	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	72	575	-	-	1068	-
Mov Cap-2 Maneuver	72	-	-	-	-	-
Stage 1	613	-	-	-	-	-
Stage 2	216	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	WBLn1	SBL	SBT
Capacity (veh/h)	-	575	1068	-
HCM Lane V/C Ratio	-	0.052	0.011	-
HCM Control Delay (s)	-	11.6	8.4	-
HCM Lane LOS	-	B	A	-
HCM 95th %tile Q(veh)	-	0.2	0	-

UNC DP TIA 2023 — Build (2030) PM
22: Columbia Street & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	906	3	41	324	404	0	0	790	396
Future Volume (vph)	0	0	0	906	3	41	324	404	0	0	790	396
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			2%			-2%	
Storage Length (ft)	0		0	600		600	250		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor				1.00	1.00		1.00					0.96
Frt						0.850						0.850
Flt Protected				0.950	0.953		0.950					
Satd. Flow (prot)	0	0	0	1656	1661	1560	1752	3504	0	0	3575	1599
Flt Permitted				0.950	0.953		0.174					
Satd. Flow (perm)	0	0	0	1649	1654	1560	320	3504	0	0	3575	1537
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						91						440
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1226			1188			609			378	
Travel Time (s)		33.4			32.4			16.6			10.3	
Confl. Peds. (#/hr)			3	3			4		3	3		4
Confl. Bikes (#/hr)												10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1007	3	46	360	449	0	0	878	440
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	503	507	46	360	449	0	0	878	440
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	7.0	10.0			10.0	10.0
Minimum Split (s)				29.8	29.8	29.8	12.8	28.1			16.1	16.1
Total Split (s)				45.0	45.0	45.0	26.0	65.0			39.0	39.0
Total Split (%)				40.9%	40.9%	40.9%	23.6%	59.1%			35.5%	35.5%
Maximum Green (s)				39.2	39.2	39.2	20.2	58.9			32.9	32.9
Yellow Time (s)				3.7	3.7	3.7	3.0	4.0			4.0	4.0
All-Red Time (s)				2.1	2.1	2.1	2.8	2.1			2.1	2.1
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				5.8	5.8	5.8	5.8	6.1			6.1	6.1
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Vehicle Extension (s)				1.0	1.0	1.0	1.0	3.0			3.0	3.0
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Walk Time (s)				7.0	7.0	7.0		7.0				
Flash Dont Walk (s)				17.0	17.0	17.0		15.0				
Pedestrian Calls (#/hr)				0	0	0		0				
Act Effct Green (s)				36.1	36.1	36.1	62.3	62.0			36.0	36.0
Actuated g/C Ratio				0.33	0.33	0.33	0.57	0.56			0.33	0.33

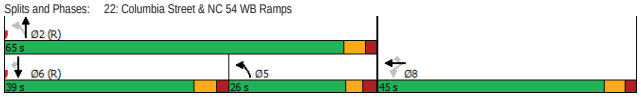
UNC DP TIA 2023 — Build (2030) PM
22: Columbia Street & NC 54 WB Ramps — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio				0.93	0.94	0.08	0.81	0.23			0.75	0.55
Control Delay				60.8	61.5	0.8	34.0	7.3			38.7	5.7
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				60.8	61.5	0.8	34.0	7.3			38.7	5.7
LOS				E	E	A	C	A			D	A
Approach Delay					58.5			19.2			27.7	
Approach LOS					E			B			C	
Queue Length 50th (ft)				343	347	0	104	34			302	0
Queue Length 95th (ft)				#541	#546	4	#316	51			381	76
Internal Link Dist (ft)		1146			1108			529			298	
Turn Bay Length (ft)				600		600	250					
Base Capacity (vph)				587	589	614	444	1975			1170	799
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.86	0.86	0.07	0.81	0.23			0.75	0.55

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 49 (45%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 35.7 — Intersection LOS: D
Intersection Capacity Utilization 82.2% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 22: Columbia Street & NC 54 WB Ramps



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
23: Columbia Street & NC 54 EB Ramps/Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	0	274	0	0	0	0	621	0	98	1631	0
Future Volume (vph)	127	0	274	0	0	0	0	621	0	98	1631	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			0%			3%			-6%	
Storage Length (ft)	250		250	0		0	0		0	250		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt			0.850									
Flt Protected	0.950	0.950								0.950		
Satd. Flow (prot)	1664	1664	1567	0	0	0	0	3486	0	1823	3645	0
Flt Permitted	0.950	0.950								0.329		
Satd. Flow (perm)	1664	1664	1567	0	0	0	0	3486	0	631	3645	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			84									
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		975			270			219			609	
Travel Time (s)		22.2			6.1			6.0			16.6	
Confl. Peds. (#/hr)							7					7
Confl. Bikes (#/hr)									1			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	141	0	304	0	0	0	0	690	0	109	1812	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	70	71	304	0	0	0	0	690	0	109	1812	0
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	13.2	13.2	13.2					16.0		12.5	27.0	
Total Split (s)	35.6	35.6	35.6					61.8		12.6	74.4	
Total Split (%)	32.4%	32.4%	32.4%					56.2%		11.5%	67.6%	
Maximum Green (s)	29.4	29.4	29.4					55.8		7.1	68.4	
Yellow Time (s)	3.1	3.1	3.1					4.3		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.7		2.4	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0					0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2	6.2					6.0		5.5	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	2.0	2.0	2.0					3.0		1.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Walk Time (s)											7.0	
Flash Dont Walk (s)											14.0	
Pedestrian Calls (#/hr)											0	
Act Effct Green (s)	20.6	20.6	20.6					64.7		77.7	77.2	
Actuated g/C Ratio	0.19	0.19	0.19					0.59		0.71	0.70	

Build (2030) PM.syn — VHB

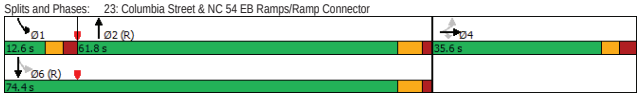
UNC DP TIA 2023 — Build (2030) PM
23: Columbia Street & NC 54 EB Ramps/Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.23	0.23	0.84					0.34		0.21	0.71	
Control Delay	37.1	37.2	50.8					4.7		0.9	2.3	
Queue Delay	0.0	0.0	0.0					0.0		0.0	0.2	
Total Delay	37.1	37.2	50.8					4.7		0.9	2.5	
LOS	D	D	D					A		A	A	
Approach Delay		46.5						4.7			2.4	
Approach LOS		D						A			A	
Queue Length 50th (ft)	44	45	154					52		0	3	
Queue Length 95th (ft)	80	80	234					m56		m7	251	
Internal Link Dist (ft)		895			190			139			529	
Turn Bay Length (ft)	250		250							250		
Base Capacity (vph)	444	444	480					2051		522	2559	
Starvation Cap Reductn	0	0	0					0		0	141	
Spillback Cap Reductn	0	0	1					0		0	65	
Storage Cap Reductn	0	0	0					0		0	0	
Reduced v/c Ratio	0.16	0.16	0.63					0.34		0.21	0.75	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 43 (39%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 9.3 — Intersection LOS: A
Intersection Capacity Utilization 82.2% — ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Columbia Street & NC 54 EB Ramps/Ramp Connector



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
24: Fordham Blvd & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Volume (vph)	0	1575	2120	50	0	112
Future Volume (vph)	0	1575	2120	50	0	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.997			0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3529	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	3529	0	0	1611
Link Speed (mph)		45	45		30	
Link Distance (ft)		1661	919		168	
Travel Time (s)		25.2	13.9		3.8	
Confl. Peds. (#/hr)					1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1750	2356	56	0	124
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1750	2412	0	0	124
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 73.8%		ICU Level of Service D	
Analysis Period (min) 15			

UNC DP TIA 2023 — Build (2030) PM
24: Fordham Blvd & Mason Farm Road — HCM 2010 TWSC

Intersection

Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Traffic Vol, veh/h	0	1575	2120	50	0	112
Future Vol, veh/h	0	1575	2120	50	0	112
Conflicting Peds, #/hr	0	0	0	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1750	2356	56	0	124

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1206
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	176
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	176
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	63.7
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	176
HCM Lane V/C Ratio	-	-	-	0.707
HCM Control Delay (s)	-	-	-	63.7
HCM Lane LOS	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	4.3

UNC DP TIA 2023 — Build (2030) PM
25: Manning Drive & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↑	↑↱		↰	↑↑	↱		↑	↱	↰↑	↑	↱
Traffic Volume (vph)	102	1581	1	15	1932	190	13	0	22	947	3	266
Future Volume (vph)	102	1581	1	15	1932	190	13	0	22	947	3	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			0%			0%			-4%	
Storage Length (ft)	350		0	150		900	0		75	500		400
Storage Lanes	2		0	1		1	0		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor		1.00		1.00		0.99		0.97				0.98
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950				0.950		0.950		
Satd. Flow (prot)	3519	3628	0	1770	3539	1583	0	1770	1583	3502	1900	1615
Flt Permitted	0.950			0.950				0.950		0.950		
Satd. Flow (perm)	3519	3628	0	1765	3539	1563	0	1723	1583	3502	1900	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						211			133			243
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		455			1093			556			574	
Travel Time (s)		6.9			16.6			15.2			11.2	
Confl. Peds. (#/hr)			3	3			4					4
Confl. Bikes (#/hr)						3						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	113	1757	1	17	2147	211	14	0	24	1052	3	296
Shared Lane Traffic (%)												
Lane Group Flow (vph)	113	1758	0	17	2147	211	0	14	24	1052	3	296
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6	4	3	3		4	4	
Permitted Phases						6			3			4
Detector Phase	5	2		1	6	4	3	3	3	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	7.0	12.0	7.0	7.0	7.0	12.0	12.0	12.0
Minimum Split (s)	31.2	18.1		13.2	18.3	31.2	13.2	13.2	13.2	31.2	31.2	31.2
Total Split (s)	31.2	104.6		13.2	86.6	49.0	13.2	13.2	13.2	49.0	49.0	49.0
Total Split (%)	17.3%	58.1%		7.3%	48.1%	27.2%	7.3%	7.3%	7.3%	27.2%	27.2%	27.2%
Maximum Green (s)	25.0	98.5		7.0	80.3	42.8	7.0	7.0	7.0	42.8	42.8	42.8
Yellow Time (s)	3.0	4.7		3.0	4.5	3.8	3.8	3.8	3.8	3.8	3.8	3.8
All-Red Time (s)	3.2	1.4		3.2	1.8	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Lost Time Adjust (s)	-1.2	-1.1		-1.2	-1.3	-1.2		-1.2	-1.2	-1.2	-1.2	-1.2
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?		Yes				Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	6.0		1.0	1.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Gap (s)	3.0	3.0		2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	20.0		0.0	0.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Time To Reduce (s)	0.0	60.0		0.0	0.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Recall Mode	None	None		None	None	None	None	None	None	None	None	None
Walk Time (s)	7.0											
Flash Dont Walk (s)	18.0											

UNC DP TIA 2023 — Build (2030) PM
25: Manning Drive & Fordham Blvd — Lanes, Volumes, Timings

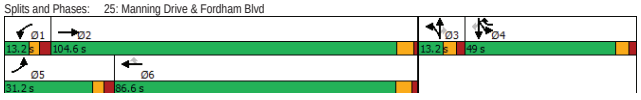
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)		4										
Act Effct Green (s)	12.8	97.3		8.2	87.0	131.3		8.2	8.2	44.2	44.2	44.2
Actuated g/C Ratio	0.08	0.57		0.05	0.51	0.78		0.05	0.05	0.26	0.26	0.26
v/c Ratio	0.43	0.84		0.20	1.18	0.17		0.16	0.12	1.15	0.01	0.50
Control Delay	80.2	36.1		87.5	124.6	0.7		86.3	1.2	134.1	51.3	14.6
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	80.2	36.1		87.5	124.6	0.7		86.3	1.2	134.1	51.3	14.6
LOS	F	D		F	F	A		F	A	F	D	B
Approach Delay		38.8			113.3			32.5			107.8	
Approach LOS		D			F			C			F	
Queue Length 50th (ft)	66	927		19	~1517	0		16	0	~755	3	48
Queue Length 95th (ft)	95	1037		50	#1848	17		45	0	#925	13	151
Internal Link Dist (ft)		375			1013			476			494	
Turn Bay Length (ft)	350			150		900			75	500		400
Base Capacity (vph)	547	2144		86	1818	1264		86	203	914	496	593
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.21	0.82		0.20	1.18	0.17		0.16	0.12	1.15	0.01	0.50

Intersection Summary

Area Type:	Other		
Cycle Length: 180			
Actuated Cycle Length: 169.4			
Natural Cycle: 145			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 86.7		Intersection LOS: F	
Intersection Capacity Utilization 95.4%		ICU Level of Service F	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 25: Manning Drive & Fordham Blvd



UNC DP TIA 2023 — Build (2030) PM
26: Oteys Road & Mason Farm Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	82	120	3	38	5	0	1	0	10	7	23
Future Volume (vph)	11	82	120	3	38	5	0	1	0	10	7	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	10	10	12	10	12	10	12	12	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.924			0.984						0.922	
Flt Protected		0.997			0.997						0.988	
Satd. Flow (prot)	0	1602	0	0	1706	0	0	1863	0	0	1697	0
Flt Permitted		0.997			0.997						0.988	
Satd. Flow (perm)	0	1602	0	0	1706	0	0	1863	0	0	1697	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1056			735			360			184	
Travel Time (s)		28.8			20.0			9.8			5.0	
Confl. Peds. (#/hr)	28					28	2					2
Confl. Bikes (#/hr)			4									3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	12	91	133	3	42	6	0	1	0	11	8	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	236	0	0	51	0	0	1	0	0	45	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 31.1% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
26: Oteys Road & Mason Farm Road — HCM 2010 AWSC

Intersection

Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	82	120	3	38	5	0	1	0	10	7	23
Future Vol, veh/h	11	82	120	3	38	5	0	1	0	10	7	23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	91	133	3	42	6	0	1	0	11	8	26
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	7.5	7.6	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	5%	7%	25%
Vol Thru, %	100%	38%	83%	18%
Vol Right, %	0%	56%	11%	57%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	213	46	40
LT Vol	0	11	3	10
Through Vol	1	82	38	7
RT Vol	0	120	5	23
Lane Flow Rate	1	237	51	44
Geometry Grp	1	1	1	1
Degree of Util (X)	0.001	0.245	0.059	0.051
Departure Headway (Hd)	4.57	3.725	4.141	4.132
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	788	961	859	853
Service Time	2.57	1.758	2.193	2.224
HCM Lane V/C Ratio	0.001	0.247	0.059	0.052
HCM Control Delay	7.6	8	7.5	7.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	1	0.2	0.2

UNC DP TIA 2023 — Build (2030) PM
27: Boundary Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	559	11	27	791	138	12	71	103	70	17	6
Future Volume (vph)	16	559	11	27	791	138	12	71	103	70	17	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	11	11	12	11	11	12
Grade (%)		-3%			1%			2%			-1%	
Storage Length (ft)	0		0	0		0	50		0	75		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.99	0.99			0.99	
Frt		0.997			0.978			0.911			0.960	
Flt Protected		0.999			0.999		0.950			0.950		
Satd. Flow (prot)	0	3577	0	0	3424	0	1694	1610	0	1754	1761	0
Flt Permitted		0.919			0.927		0.740			0.578		
Satd. Flow (perm)	0	3290	0	0	3177	0	1306	1610	0	1067	1761	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			46			114			7	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		1100			226			551			371	
Travel Time (s)		30.0			6.2			15.0			10.1	
Confl. Peds. (#/hr)	10					10	12					12
Confl. Bikes (#/hr)			1			3			5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Adj. Flow (vph)	18	621	12	30	879	153	13	79	114	78	19	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	651	0	0	1062	0	13	193	0	78	26	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.4	15.4		15.6	15.6		12.6	12.6		24.7	24.7	
Total Split (s)	30.3	30.3		30.3	30.3		24.7	24.7		24.7	24.7	
Total Split (%)	55.1%	55.1%		55.1%	55.1%		44.9%	44.9%		44.9%	44.9%	
Maximum Green (s)	24.9	24.9		24.7	24.7		19.1	19.1		19.0	19.0	
Yellow Time (s)	3.7	3.7		3.5	3.5		3.7	3.7		3.9	3.9	
All-Red Time (s)	1.7	1.7		2.1	2.1		1.9	1.9		1.8	1.8	
Lost Time Adjust (s)		-0.4			-0.6		-0.6	-0.6		-0.7	-0.7	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		1.0	1.0		1.0	1.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										12.0	12.0	
Pedestrian Calls (#/hr)										0	0	

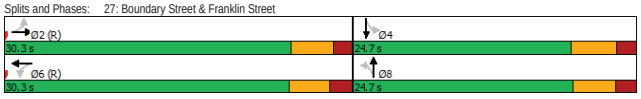
UNC DP TIA 2023 — Build (2030) PM
27: Boundary Street & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		39.5			39.5		9.0	9.0		9.0	9.0	
Actuated g/C Ratio		0.72			0.72		0.16	0.16		0.16	0.16	
v/c Ratio		0.28			0.46		0.06	0.54		0.45	0.09	
Control Delay		2.1			5.4		18.8	15.4		28.8	16.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		2.1			5.4		18.8	15.4		28.8	16.0	
LOS		A			A		B	B		C	B	
Approach Delay		2.1			5.4			15.6			25.6	
Approach LOS		A			A			B			C	
Queue Length 50th (ft)		19			64		4	24		24	6	
Queue Length 95th (ft)		m33			133		15	67		54	21	
Internal Link Dist (ft)		1020			146			471			291	
Turn Bay Length (ft)							50			75		
Base Capacity (vph)		2366			2297		467	649		382	635	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.28			0.46		0.03	0.30		0.20	0.04	

Intersection Summary

Area Type: Other
Cycle Length: 55
Actuated Cycle Length: 55
Offset: 34 (62%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 6.4 — Intersection LOS: A
Intersection Capacity Utilization 74.7% — ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 27: Boundary Street & Franklin Street



UNC DP TIA 2023 — Build (2030) PM
28: Park Place & Franklin Street — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	728	2	65	960	0	124
Future Volume (vph)	728	2	65	960	0	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	9	12
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt					0.865	
Flt Protected				0.997		
Satd. Flow (prot)	3539	0	0	3529	1450	0
Flt Permitted				0.997		
Satd. Flow (perm)	3539	0	0	3529	1450	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	461			1129	375	
Travel Time (s)	12.6			30.8	10.2	
Confl. Peds. (#/hr)		11	11			
Confl. Bikes (#/hr)		6				4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	809	2	72	1067	0	138
Shared Lane Traffic (%)						
Lane Group Flow (vph)	811	0	0	1139	138	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.3%		ICU Level of Service C	
Analysis Period (min) 15			

UNC DP TIA 2023 — Build (2030) PM
28: Park Place & Franklin Street — HCM 2010 TWSC

Intersection

Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	728	2	65	960	0	124
Future Vol, veh/h	728	2	65	960	0	124
Conflicting Peds, #/hr	0	11	11	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	809	2	72	1067	0	138

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	822	0	1499	417
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	678	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	803	-	113	585
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	466	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	797	-	87	581
Mov Cap-2 Maneuver	-	-	-	-	87	-
Stage 1	-	-	-	-	390	-
Stage 2	-	-	-	-	363	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	581	-	-	797	-
HCM Lane V/C Ratio	0.237	-	-	0.091	-
HCM Control Delay (s)	13.1	-	-	10	1
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.3	-

UNC DP TIA 2023 — Build (2030) PM
29: Battle Lane & Boundary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	59	83	0	0	144	171	1	88	23
Future Volume (vph)	0	0	0	59	83	0	0	144	171	1	88	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt								0.927			0.972	
Flt Protected					0.980							
Satd. Flow (prot)	0	0	0	0	1825	0	0	1727	0	0	1811	0
Flt Permitted					0.980							
Satd. Flow (perm)	0	0	0	0	1825	0	0	1727	0	0	1811	0
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		81			509			63			394	
Travel Time (s)		1.8			13.9			1.7			10.7	
Confl. Peds. (#/hr)			88			34	2		56	56		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	66	92	0	0	160	190	1	98	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	158	0	0	350	0	0	125	0
Sign Control		Stop			Stop			Yield			Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.3%		ICU Level of Service A	
Analysis Period (min) 15			

UNC DP TIA 2023 — Build (2030) PM
30: Country Club Road & Battle Lane — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	168	480	497	248	147	0
Future Volume (vph)	168	480	497	248	147	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.955			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1779	0	1770	0
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1779	0	1770	0
Link Speed (mph)		25	25		25	
Link Distance (ft)		90	508		63	
Travel Time (s)		2.5	13.9		1.7	
Confl. Peds. (#/hr)	34			56		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	187	533	552	276	163	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	187	533	828	0	163	0
Sign Control		Free	Free		Yield	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 70.1%		ICU Level of Service C	
Analysis Period (min) 15			

UNC DP TIA 2023 — Build (2030) PM
31: Country Club Road & Paul Green Theater Drive/Gimghoul Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	2	61	11	2	9	21	679	5	7	579	20
Future Volume (vph)	29	2	61	11	2	9	21	679	5	7	579	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			2%			1%			1%	
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.95			0.95		0.94	1.00			0.99	
Frt		0.910			0.944			0.999			0.996	
Flt Protected		0.985			0.976		0.950				0.999	
Satd. Flow (prot)	0	1652	0	0	1634	0	1761	1851	0	0	1827	0
Flt Permitted		0.886			0.748		0.418				0.992	
Satd. Flow (perm)	0	1455	0	0	1237	0	726	1851	0	0	1815	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		68			10			1			4	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		153			324			421			824	
Travel Time (s)		4.2			8.8			11.5			22.5	
Confl. Peds. (#/hr)	16		9	9		16	43		6	6		43
Confl. Bikes (#/hr)						3						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	32	2	68	12	2	10	23	754	6	8	643	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	102	0	0	24	0	23	760	0	0	673	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2	2	
Detector Phase	8	8		4	4		6	6		2	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	21.0	21.0		18.6	18.6		15.1	15.1		15.1	15.1	
Total Split (s)	24.0	24.0		24.0	24.0		86.0	86.0		86.0	86.0	
Total Split (%)	21.8%	21.8%		21.8%	21.8%		78.2%	78.2%		78.2%	78.2%	
Maximum Green (s)	18.0	18.0		18.4	18.4		80.9	80.9		80.9	80.9	
Yellow Time (s)	3.5	3.5		3.1	3.1		3.1	3.1		3.1	3.1	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0			-0.6		-0.1	-0.1			-0.1	
Total Lost Time (s)		5.0			5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Walk Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Flash Dont Walk (s)	11.0	11.0		9.0	9.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		9.6			9.6		90.4	90.4			90.4	
Actuated g/C Ratio		0.09			0.09		0.82	0.82			0.82	

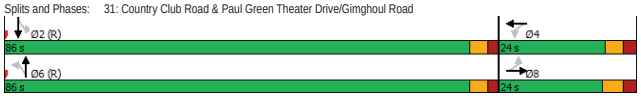
UNC DP TIA 2023 — Build (2030) PM
31: Country Club Road & Paul Green Theater Drive/Gimghoul Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.54			0.21		0.04	0.50			0.45	
Control Delay		29.8			35.7		2.3	4.2			4.2	
Queue Delay		0.0			0.0		0.0	0.3			0.0	
Total Delay		29.8			35.7		2.3	4.5			4.2	
LOS		C			D		A	A			A	
Approach Delay		29.8			35.7			4.4			4.2	
Approach LOS		C			D			A			A	
Queue Length 50th (ft)		23			9		2	108			82	
Queue Length 95th (ft)		75			35		m6	172			m203	
Internal Link Dist (ft)		73			244			341			744	
Turn Bay Length (ft)							50					
Base Capacity (vph)		307			221		596	1520			1491	
Starvation Cap Reductn		0			0		0	262			0	
Spillback Cap Reductn		0			0		0	0			6	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.33			0.11		0.04	0.60			0.45	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 107 (97%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 6.4 — Intersection LOS: A
Intersection Capacity Utilization 53.9% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 31: Country Club Road & Paul Green Theater Drive/Gimghoul Road



Build (2030) PM.syn VHB

UNC DP TIA 2023 — Build (2030) PM
32: Hibbard Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	818	0	18	643	39	0	2	40	28	22	62
Future Volume (vph)	28	818	0	18	643	39	0	2	40	28	22	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			2%			-5%			-2%	
Storage Length (ft)	150		0	75		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.86			0.85	0.97			0.68			0.88	
Frt					0.991			0.871			0.925	
Flt Protected	0.950			0.950							0.988	
Satd. Flow (prot)	1778	3557	0	1752	3361	0	0	1126	0	0	1632	0
Flt Permitted	0.345			0.314							0.900	
Satd. Flow (perm)	558	3557	0	494	3361	0	0	1126	0	0	1371	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8			44			64	
Link Speed (mph)		25			25			25			20	
Link Distance (ft)		469			330			188			294	
Travel Time (s)		12.8			9.0			5.1			10.0	
Confl. Peds. (#/hr)	259		155	155		259	59		354	354		59
Confl. Bikes (#/hr)			1			2						6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	31	909	0	20	714	43	0	2	44	31	24	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	909	0	20	757	0	0	46	0	0	124	0
Turn Type	D.P+P	NA		Perm	NA			NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	6			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	12.3	18.5		22.5	22.5		29.3	29.3		29.3	29.3	
Total Split (s)	14.0	66.0		52.0	52.0		34.0	34.0		34.0	34.0	
Total Split (%)	14.0%	66.0%		52.0%	52.0%		34.0%	34.0%		34.0%	34.0%	
Maximum Green (s)	8.7	60.5		46.5	46.5		27.7	27.7		27.7	27.7	
Yellow Time (s)	3.0	3.2		3.2	3.2		3.5	3.5		3.0	3.0	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.8	2.8		3.3	3.3	
Lost Time Adjust (s)	-0.1	-0.3		-0.4	-0.4			-1.3			-1.3	
Total Lost Time (s)	5.2	5.2		5.1	5.1			5.0			5.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		6.0		10.0	10.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	75.4	78.6		71.3	71.3			11.2			11.2	
Actuated g/C Ratio	0.75	0.79		0.71	0.71			0.11			0.11	

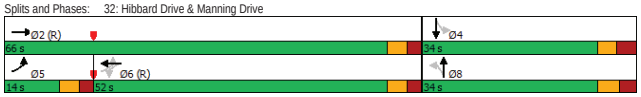
UNC DP TIA 2023 — Build (2030) PM
32: Hibbard Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.06	0.33		0.06	0.32			0.28			0.59	
Control Delay	2.0	2.8		4.6	3.9			20.7			32.9	
Queue Delay	0.0	0.2		0.0	0.0			0.0			0.0	
Total Delay	2.0	3.0		4.6	3.9			20.7			32.9	
LOS	A	A		A	A			C			C	
Approach Delay		2.9			3.9			20.7			32.9	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	3	70		2	50			3			37	
Queue Length 95th (ft)	m5	72		11	103			38			90	
Internal Link Dist (ft)		389			250			108			214	
Turn Bay Length (ft)	150			75								
Base Capacity (vph)	534	2794		352	2398			357			443	
Starvation Cap Reductn	0	863		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.06	0.47		0.06	0.32			0.13			0.28	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 42 (42%), Referenced to phase 2:EBT and 6:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 5.7 — Intersection LOS: A
Intersection Capacity Utilization 50.9% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 32: Hibbard Drive & Manning Drive



Build (2030) PM.syn VHB

UNC DP TIA 2023 — Build (2030) PM
33: Paul Harden Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1028	18	24	551	28	34	7	149	21	16	12
Future Volume (vph)	16	1028	18	24	551	28	34	7	149	21	16	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	12	10	10	12
Grade (%)		-2%			2%			8%			-11%	
Storage Length (ft)	200		0	0		0	75		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.93	1.00			0.99		0.78	0.69		0.77	0.90	
Frt		0.997			0.993			0.857			0.937	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3556	0	1752	3441	0	1586	990	0	1742	1546	0
Flt Permitted	0.399			0.206			0.737			0.402		
Satd. Flow (perm)	698	3556	0	380	3441	0	958	990	0	564	1546	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			7			162			13	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		433			267			379			301	
Travel Time (s)		11.8			7.3			10.3			8.2	
Confl. Peds. (#/hr)	72		38	38		72	185		290	290		185
Confl. Bikes (#/hr)			2			1			3			3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	18	1142	20	27	612	31	38	8	166	23	18	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	1162	0	27	643	0	38	174	0	23	31	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.9	23.1		11.9	22.1		28.8	28.8		30.3	30.3	
Total Split (s)	12.2	55.8		12.2	55.8		32.0	32.0		32.0	32.0	
Total Split (%)	12.2%	55.8%		12.2%	55.8%		32.0%	32.0%		32.0%	32.0%	
Maximum Green (s)	7.3	50.7		7.3	50.7		26.2	26.2		25.7	25.7	
Yellow Time (s)	3.0	3.3		3.0	3.3		3.0	3.0		3.5	3.5	
All-Red Time (s)	1.9	1.8		1.9	1.8		2.8	2.8		2.8	2.8	
Lost Time Adjust (s)	0.2	-0.1		0.1	0.1		-0.4	-0.4		-0.9	-0.9	
Total Lost Time (s)	5.1	5.0		5.0	5.2		5.4	5.4		5.4	5.4	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			10.0		16.0	16.0		17.0	17.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	76.6	71.6		75.7	73.8		10.9	10.9		10.9	10.9	

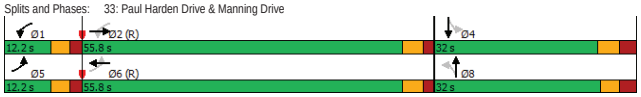
UNC DP TIA 2023 — Build (2030) PM
33: Paul Harden Drive & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.77	0.72		0.76	0.74		0.11	0.11		0.11	0.11	
v/c Ratio	0.03	0.46		0.07	0.25		0.37	0.69		0.38	0.17	
Control Delay	2.9	5.0		5.2	7.9		49.7	22.8		57.2	28.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.9	5.0		5.2	7.9		49.7	22.8		57.2	28.0	
LOS	A	A		A	A		D	C		E	C	
Approach Delay		5.0			7.8			27.6			40.4	
Approach LOS		A			A			C			D	
Queue Length 50th (ft)	1	51		4	86		23	7		14	11	
Queue Length 95th (ft)	8	264		14	181		52	72		37	35	
Internal Link Dist (ft)		353			187			299			221	
Turn Bay Length (ft)	200						75			100		
Base Capacity (vph)	612	2546		387	2540		254	382		150	420	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.46		0.07	0.25		0.15	0.46		0.15	0.07	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 60 (60%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 9.0 — Intersection LOS: A
Intersection Capacity Utilization 57.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 33: Paul Harden Drive & Manning Drive



UNC DP TIA 2023 — Build (2030) PM
34: East Drive & Dogwood Deck Entrance/Jackson Circle — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	1	0	6	7	608	1	4	61	83
Future Volume (vph)	0	0	0	1	0	6	7	608	1	4	61	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	12	12	10	12	12
Storage Length (ft)	0		0	0		0	100		0	75		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.882						0.914	
Flt Protected					0.994		0.950			0.950		
Satd. Flow (prot)	0	0	0	0	1633	0	1652	1863	0	1652	1703	0
Flt Permitted					0.994		0.950			0.950		
Satd. Flow (perm)	0	0	0	0	1633	0	1652	1863	0	1652	1703	0
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		321			259			210			315	
Travel Time (s)		7.3			7.1			5.7			8.6	
Confl. Peds. (#/hr)	21		3	3		21	13					13
Confl. Bikes (#/hr)												3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1	0	7	8	676	1	4	68	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	8	0	8	677	0	4	160	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.1% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
34: East Drive & Dogwood Deck Entrance/Jackson Circle — HCM 2010 TWSC

Intersection

Int Delay, s/veh 0.2

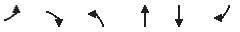
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	0	6	7	608	1	4	61	83
Future Vol, veh/h	0	0	0	1	0	6	7	608	1	4	61	83
Conflicting Peds, #/hr	21	0	3	3	0	21	13	0	0	0	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	75	-	-
Veh in Median Storage, #	-2	62	144	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	1	0	7	8	676	1	4	68	92

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	818	874	698	173	0	0	677	0	0
Stage 1	693	693	-	-	-	-	-	-	-
Stage 2	125	181	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	346	288	440	1404	-	-	915	-	-
Stage 1	496	445	-	-	-	-	-	-	-
Stage 2	901	750	-	-	-	-	-	-	-
Platoon blocked, %						-		-	-
Mov Cap-1 Maneuver	342	0	432	1404	-	-	915	-	-
Mov Cap-2 Maneuver	342	0	-	-	-	-	-	-	-
Stage 1	493	0	-	-	-	-	-	-	-
Stage 2	896	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0.1	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1404	-	-	416	915	-	-
HCM Lane V/C Ratio	0.006	-	-	0.019	0.005	-	-
HCM Control Delay (s)	7.6	-	-	13.8	9	-	-
HCM Lane LOS	A	-	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	-	-

UNC DP TIA 2023 — Build (2030) PM
35: East Drive & Dogwood Deck Exit — Lanes, Volumes, Timings



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	240	162	0	286	62	0
Future Volume (vph)	240	162	0	286	62	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	1770	1583	0	1863	1863	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	1583	0	1863	1863	0
Link Speed (mph)	30			25	30	
Link Distance (ft)	134			176	210	
Travel Time (s)	3.0			4.8	4.8	
Confl. Peds. (#/hr)	2	3	15			15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	267	180	0	318	69	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	267	180	0	318	69	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

UNC DP TIA 2023 — Build (2030) PM
35: East Drive & Dogwood Deck Exit — HCM 2010 TWSC

Intersection

Int Delay, s/veh	7

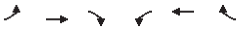
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	240	162	0	286	62	0
Future Vol, veh/h	240	162	0	286	62	0
Conflicting Peds, #/hr	2	3	15	0	0	15
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	267	180	0	318	69	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	389	72	-	0	-	0
Stage 1	69	-	-	-	-	-
Stage 2	320	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	615	990	0	-	-	0
Stage 1	954	-	0	-	-	0
Stage 2	736	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	615	988	-	-	-	-
Mov Cap-2 Maneuver	615	-	-	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	736	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	615	988	-
HCM Lane V/C Ratio	-	0.434	0.182	-
HCM Control Delay (s)	-	15.3	9.5	-
HCM Lane LOS	-	C	A	-
HCM 95th %tile Q(veh)	-	2.2	0.7	-

UNC DP TIA 2023 — Build (2030) PM
36: Mason Farm Road & Hibbard Drive — Lanes, Volumes, Timings



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	170	1	0	77	35	17	0	10	134	0	38
Future Volume (vph)	17	170	1	0	77	35	17	0	10	134	0	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	11	12	12	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.958			0.950			0.970	
Flt Protected		0.995						0.969			0.962	
Satd. Flow (prot)	0	1790	0	0	1725	0	0	1600	0	0	1622	0
Flt Permitted		0.995						0.969			0.962	
Satd. Flow (perm)	0	1790	0	0	1725	0	0	1600	0	0	1622	0
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		221			213			480			560	
Travel Time (s)		6.0			5.8			10.9			15.3	
Confl. Peds. (#/hr)							33		73	73		33
Confl. Bikes (#/hr)						8			1			10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	19	189	1	0	86	39	19	0	11	149	0	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	209	0	0	125	0	0	30	0	0	191	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

UNC DP TIA 2023 — Build (2030) PM
36: Mason Farm Road & Hibbard Drive — HCM 2010 TWSC

Intersection

Int Delay, s/veh	14.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	170	1	0	77	35	17	0	10	134	0	38
Future Vol, veh/h	17	170	1	0	77	35	17	0	10	134	0	38
Conflicting Peds, #/hr	0	0	0	0	0	0	33	0	73	73	0	33
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	19	189	1	0	86	39	19	0	11	149	0	42

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	458	474	54	531	490	79	75	0	0	84	0	0
Stage 1	352	352	-	117	117	-	-	-	-	-	-	-
Stage 2	106	122	-	414	373	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	513	489	1013	459	479	981	1524	-	-	1513	-	-
Stage 1	665	632	-	888	799	-	-	-	-	-	-	-
Stage 2	900	795	-	616	618	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	363	397	987	249	388	926	1486	-	-	1429	-	-
Mov Cap-2 Maneuver	363	397	-	249	388	-	-	-	-	-	-	-
Stage 1	640	550	-	828	745	-	-	-	-	-	-	-
Stage 2	753	741	-	361	538	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.9	15.3	4.7	6.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1486	-	-	395	474	1429	-	-
HCM Lane V/C Ratio	0.013	-	-	0.529	0.263	0.104	-	-
HCM Control Delay (s)	7.5	0	-	23.9	15.3	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	3	1	0.3	-	-

UNC DP TIA 2023 — Build (2030) PM
37: Bell Tower Drive & South Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	427	45	49	476	133	106
Future Volume (vph)	427	45	49	476	133	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	50		0	100
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.96		0.89		0.43	0.74
Frt	0.987					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1773	0	1770	1863	1770	1583
Flt Permitted			0.305		0.950	
Satd. Flow (perm)	1773	0	504	1863	767	1167
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	10					118
Link Speed (mph)	25			25	30	
Link Distance (ft)	696			744	512	
Travel Time (s)	19.0			20.3	11.6	
Confl. Peds. (#/hr)		199	199		472	135
Confl. Bikes (#/hr)		16				10
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	474	50	54	529	148	118
Shared Lane Traffic (%)						
Lane Group Flow (vph)	524	0	54	529	148	118
Turn Type	NA		D.P+P	NA	Perm	Perm
Protected Phases	2		1	6		
Permitted Phases			2		8	8
Detector Phase	2		1	6	8	8
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	7.0	7.0
Minimum Split (s)	22.4		12.4	15.4	22.5	22.5
Total Split (s)	25.0		12.4	37.4	22.6	22.6
Total Split (%)	41.7%		20.7%	62.3%	37.7%	37.7%
Maximum Green (s)	19.6		7.0	32.0	17.5	17.5
Yellow Time (s)	3.3		3.0	3.3	3.4	3.4
All-Red Time (s)	2.1		2.4	2.1	1.7	1.7
Lost Time Adjust (s)	-0.5		-0.4	-0.4	-0.1	-0.1
Total Lost Time (s)	4.9		5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?			Yes			
Vehicle Extension (s)	3.0		1.0	3.0	2.0	2.0
Recall Mode	C-Min		None	Min	None	None
Walk Time (s)	7.0				7.0	7.0
Flash Dont Walk (s)	10.0				10.0	10.0
Pedestrian Calls (#/hr)	0				0	0
Act Effct Green (s)	28.2		32.5	35.5	14.5	14.5
Actuated g/C Ratio	0.47		0.54	0.59	0.24	0.24
v/c Ratio	0.63		0.13	0.48	0.80	0.32

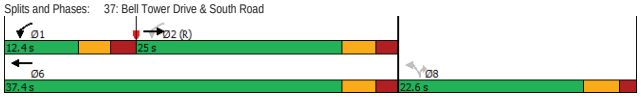
UNC DP TIA 2023 — Build (2030) PM
37: Bell Tower Drive & South Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Control Delay	17.9		7.3	9.7	52.7	6.5
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	17.9		7.3	9.7	52.7	6.5
LOS	B		A	A	D	A
Approach Delay	17.9			9.5	32.2	
Approach LOS	B			A	C	
Queue Length 50th (ft)	116		8	106	48	0
Queue Length 95th (ft)	#313		22	184	#125	31
Internal Link Dist (ft)	616			664	432	
Turn Bay Length (ft)			50			100
Base Capacity (vph)	838		429	1102	224	425
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.63		0.13	0.48	0.66	0.28

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:EBWB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 17.1 — Intersection LOS: B
Intersection Capacity Utilization 58.3% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 37: Bell Tower Drive & South Road



UNC DP TIA 2023 — Build (2030) PM
38: Manning Drive & Hospital Exit — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	236	609	0	227	213
Future Volume (vph)	0	236	609	0	227	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					0.95	0.96
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3539	3539	0	1770	1583
Flt Permitted					0.950	
Satd. Flow (perm)	0	3539	3539	0	1680	1522
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						63
Link Speed (mph)		35	35		20	
Link Distance (ft)		334	382		292	
Travel Time (s)		6.5	7.4		10.0	
Confl. Peds. (#/hr)	165			165	44	23
Confl. Bikes (#/hr)				1		1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	262	677	0	252	237
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	262	677	0	252	237
Turn Type		NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases						4
Detector Phase		2	6		4	4
Switch Phase						
Minimum Initial (s)		10.0	10.0		7.0	7.0
Minimum Split (s)		14.7	19.4		31.1	31.1
Total Split (s)		52.0	52.0		48.0	48.0
Total Split (%)		52.0%	52.0%		48.0%	48.0%
Maximum Green (s)		47.3	47.6		42.9	42.9
Yellow Time (s)		3.3	3.0		3.0	3.0
All-Red Time (s)		1.4	1.4		2.1	2.1
Lost Time Adjust (s)		0.3	0.6		-0.1	-0.1
Total Lost Time (s)		5.0	5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		2.0	2.0		2.0	2.0
Recall Mode		C-Min	C-Min		None	None
Walk Time (s)			7.0		7.0	7.0
Flash Dont Walk (s)			8.0		19.0	19.0
Pedestrian Calls (#/hr)			0		0	0
Act Effct Green (s)		70.6	70.6		19.4	19.4
Actuated g/C Ratio		0.71	0.71		0.19	0.19
v/c Ratio		0.10	0.27		0.74	0.69
Control Delay		4.5	3.6		50.2	36.9
Queue Delay		0.0	0.2		0.0	0.0
Total Delay		4.5	3.8		50.2	36.9

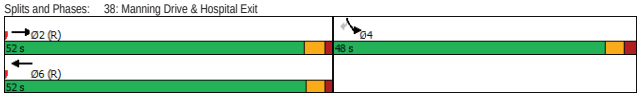
UNC DP TIA 2023 — Build (2030) PM
38: Manning Drive & Hospital Exit — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
LOS		A	A		D	D
Approach Delay		4.5	3.8		43.8	
Approach LOS		A	A		D	
Queue Length 50th (ft)		17	35		153	104
Queue Length 95th (ft)		56	124		215	169
Internal Link Dist (ft)		254	302		212	
Turn Bay Length (ft)						
Base Capacity (vph)		2499	2499		761	690
Starvation Cap Reductn		0	974		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.10	0.44		0.33	0.34

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 95 (95%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 17.6 — Intersection LOS: B
Intersection Capacity Utilization 43.9% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 38: Manning Drive & Hospital Exit



UNC DP TIA 2023 — Build (2030) PM
39: Craige Deck & Manning Drive — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	846	11	16	544	103	208
Future Volume (vph)	846	11	16	544	103	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.998					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3532	0	1770	3539	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3532	0	1770	3539	1770	1583
Link Speed (mph)	25			25	15	
Link Distance (ft)	330			433	367	
Travel Time (s)	9.0			11.8	16.7	
Confl. Peds. (#/hr)		46	46		3	
Confl. Bikes (#/hr)		6				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	940	12	18	604	114	231
Shared Lane Traffic (%)						
Lane Group Flow (vph)	952	0	18	604	114	231
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 43.3% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
39: Craige Deck & Manning Drive — HCM 2010 TWSC

Intersection
Int Delay, s/veh 8.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	846	11	16	544	103	208
Future Vol, veh/h	846	11	16	544	103	208
Conflicting Peds, #/hr	0	46	46	0	3	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	940	12	18	604	114	231

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	998	0	1333	522
Stage 1	-	-	-	-	992	-
Stage 2	-	-	-	-	341	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	689	-	145	499
Stage 1	-	-	-	-	320	-
Stage 2	-	-	-	-	692	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	663	-	135	480
Mov Cap-2 Maneuver	-	-	-	-	135	-
Stage 1	-	-	-	-	308	-
Stage 2	-	-	-	-	672	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	47.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	135	480	-	-	663	-
HCM Lane V/C Ratio	0.848	0.481	-	-	0.027	-
HCM Control Delay (s)	103.9	19.3	-	-	10.6	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	5.4	2.6	-	-	0.1	-

UNC DP TIA 2023 — Build (2030) PM
101: US 15/501 & Estes Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	5	385	5	6	10	272	1682	2	12	1382	113
Future Volume (vph)	210	5	385	5	6	10	272	1682	2	12	1382	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	260		0	150		0	250		0	220		225
Storage Lanes	0		2	0		0	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.97	0.98		0.92							0.99
Frt			0.850		0.938							0.850
Flt Protected		0.954			0.988		0.950			0.950		
Satd. Flow (prot)	0	1760	2760	0	1569	0	3400	3505	0	1752	3505	1568
Flt Permitted		0.954			0.988		0.950			0.950		
Satd. Flow (perm)	0	1702	2701	0	1569	0	3400	3505	0	1752	3505	1548
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149		11							75
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		1824			872			1606			1920	
Travel Time (s)		41.5			19.8			24.3			29.1	
Confl. Peds. (#/hr)	21					21						
Confl. Bikes (#/hr)			1			2						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	233	6	428	6	7	11	302	1869	2	13	1536	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	239	428	0	24	0	302	1871	0	13	1536	126
Turn Type	Split	NA	pm+ov	Split	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	3	3	5	4	4		5	2		1	6	3
Permitted Phases			3									6
Detector Phase	3	3	5	4	4		5	2		1	6	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.6	13.6	13.7	13.7	13.7		13.7	18.1		13.5	18.1	13.6
Total Split (s)	39.0	39.0	27.0	13.7	13.7		27.0	113.8		13.5	100.3	39.0
Total Split (%)	21.7%	21.7%	15.0%	7.6%	7.6%		15.0%	63.2%		7.5%	55.7%	21.7%
Maximum Green (s)	32.4	32.4	20.3	7.0	7.0		20.3	107.7		7.0	94.2	32.4
Yellow Time (s)	3.8	3.8	3.0	3.2	3.2		3.0	4.4		3.0	4.6	3.8
All-Red Time (s)	2.8	2.8	3.7	3.5	3.5		3.7	1.7		3.5	1.5	2.8
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		6.6	6.7		6.7		6.7	6.1		6.5	6.1	6.6
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	3.0	1.0	1.0		3.0	6.0		3.0	6.0	2.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)		27.8	47.4		7.0		19.7	125.8		7.0	104.9	132.2

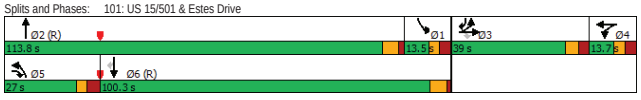
UNC DP TIA 2023 — Build (2030) PM
101: US 15/501 & Estes Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio		0.15	0.26		0.04		0.11	0.70		0.04	0.58	0.73
v/c Ratio		0.88	0.52		0.34		0.81	0.76		0.19	0.75	0.11
Control Delay		104.7	29.9		67.1		95.5	23.7		75.9	19.4	0.4
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		104.7	29.9		67.1		95.5	23.7		75.9	19.4	0.4
LOS		F	C		E		F	C		E	B	A
Approach Delay		56.7			67.1			33.7			18.4	
Approach LOS		E			E			C			B	
Queue Length 50th (ft)		279	128		15		179	725		14	220	0
Queue Length 95th (ft)		#384	178		51		#242	1090		m25	373	1
Internal Link Dist (ft)		1744			792			1526			1840	
Turn Bay Length (ft)							250			220		225
Base Capacity (vph)		316	842		71		391	2450		68	2041	1197
Starvation Cap Reductn		0	0		0		0	0		0	0	0
Spillback Cap Reductn		0	0		0		0	0		0	0	0
Storage Cap Reductn		0	0		0		0	0		0	0	0
Reduced v/c Ratio		0.76	0.51		0.34		0.77	0.76		0.19	0.75	0.11

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 27 (15%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 31.6 — Intersection LOS: C
Intersection Capacity Utilization 87.0% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 101: US 15/501 & Estes Drive



UNC DP TIA 2023 — Build (2030) PM
102: US 15/501 & Willow Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	26	23	34	42	32	110	1694	87	44	1412	242
Future Volume (vph)	151	26	23	34	42	32	110	1694	87	44	1412	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	0		0	220		0	220		260
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		0.99		0.99	0.99							0.97
Frt		0.929			0.935			0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1689	0	1752	1715	0	1752	3480	0	1752	3505	1568
Flt Permitted	0.490			0.721			0.096			0.062		
Satd. Flow (perm)	904	1689	0	1315	1715	0	177	3480	0	114	3505	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			18			5				176
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		1227			1197			1920			792	
Travel Time (s)		33.5			32.6			29.1			12.0	
Confl. Peds. (#/hr)			6	6			2					2
Confl. Bikes (#/hr)			4			1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	168	29	26	38	47	36	122	1882	97	49	1569	269
Shared Lane Traffic (%)												
Lane Group Flow (vph)	168	55	0	38	83	0	122	1979	0	49	1569	269
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	12.0
Minimum Split (s)	15.0	33.0		15.0	33.0		15.0	90.0		15.0	80.0	80.0
Total Split (s)	15.0	33.0		15.0	33.0		22.0	117.0		15.0	110.0	110.0
Total Split (%)	8.3%	18.3%		8.3%	18.3%		12.2%	65.0%		8.3%	61.1%	61.1%
Maximum Green (s)	8.7	26.6		9.1	26.6		15.9	110.9		9.4	103.9	103.9
Yellow Time (s)	3.0	3.9		3.0	3.9		3.0	4.6		3.0	4.6	4.6
All-Red Time (s)	3.3	2.5		2.9	2.5		3.1	1.5		2.6	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.3	6.4		5.9	6.4		6.1	6.1		5.6	6.1	6.1
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-Max
Walk Time (s)		4.0									5.0	5.0
Flash Dont Walk (s)		22.0									9.0	9.0
Pedestrian Calls (#/hr)		0									0	0
Act Effct Green (s)	19.6	12.2		20.1	11.5		129.0	129.0		124.2	123.7	123.7

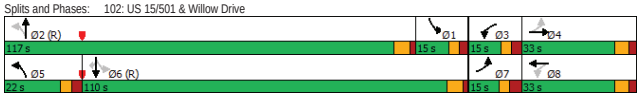
Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
102: US 15/501 & Willow Drive — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.11	0.07		0.11	0.06		0.72	0.72		0.69	0.69	0.69
v/c Ratio	1.21	0.41		0.23	0.66		0.54	0.79		0.31	0.65	0.24
Control Delay	204.3	60.4		68.5	87.3		27.2	11.0		15.5	8.4	1.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.2		0.0	0.4	0.0
Total Delay	204.3	60.4		68.5	87.3		27.2	11.1		15.5	8.8	1.3
LOS	F	E		E	F		C	B		B	A	A
Approach Delay		168.8			81.4			12.1			7.9	
Approach LOS		F			F			B			A	
Queue Length 50th (ft)	~217	39		40	76		33	340		7	189	4
Queue Length 95th (ft)	#364	90		77	138		m83	342		m13	180	10
Internal Link Dist (ft)		1147			1117			1840			712	
Turn Bay Length (ft)	200						220			220		260
Base Capacity (vph)	139	267		176	268		268	2494		164	2409	1098
Starvation Cap Reductn	0	0		0	0		0	0		0	357	0
Spillback Cap Reductn	0	0		0	0		0	71		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.21	0.21		0.22	0.31		0.46	0.82		0.30	0.76	0.24

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 31 (17%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.21
Intersection Signal Delay: 20.3 — Intersection LOS: C
Intersection Capacity Utilization 86.7% — ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 102: US 15/501 & Willow Drive



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	112	86	233	65	83	147	224	1525	181	6	107	1280
Future Volume (vph)	112	86	233	65	83	147	224	1525	181	6	107	1280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	525		150	350		150	350		175		225	
Storage Lanes	1		1	2		1	1		1		1	
Taper Length (ft)	25			25			25				25	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt			0.850			0.850			0.850			
Flt Protected	0.950			0.950			0.950				0.950	
Satd. Flow (prot)	1752	1863	1568	3433	1863	1583	1752	3505	1583	0	1769	3505
Flt Permitted	0.950			0.950			0.089				0.066	
Satd. Flow (perm)	1752	1863	1568	3433	1863	1583	164	3505	1583	0	123	3505
Right Turn on Red			Yes			Yes			Yes			
Satd. Flow (RTOR)			61			138			99			
Link Speed (mph)		30			30			45				45
Link Distance (ft)		828			647			792				1376
Travel Time (s)		18.8			14.7			12.0				20.8
Peak Hour Factor	0.90	0.92	0.90	0.92	0.92	0.92	0.90	0.90	0.92	0.90	0.92	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	103%	100%	100%
Heavy Vehicles (%)	3%	2%	3%	2%	2%	2%	3%	3%	2%	3%	2%	3%
Adj. Flow (vph)	124	93	259	71	90	160	249	1694	197	7	116	1422
Shared Lane Traffic (%)												
Lane Group Flow (vph)	124	93	259	71	90	160	249	1694	197	0	123	1422
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	7	4	5	3	8	1!	5	2	3	1!	1	6
Permitted Phases			4			8	6		2	2	2	
Detector Phase	7	4	5	3	8	1	5	2	3	1	1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	12.0
Minimum Split (s)	13.4	43.5	13.3	13.6	40.5	13.4	13.3	42.5	13.6	13.4	13.4	36.5
Total Split (s)	21.7	48.3	31.2	14.0	40.6	18.0	31.2	99.7	14.0	18.0	18.0	86.5
Total Split (%)	12.1%	26.8%	17.3%	7.8%	22.6%	10.0%	17.3%	55.4%	7.8%	10.0%	10.0%	48.1%
Maximum Green (s)	15.3	41.8	24.9	7.4	34.1	11.6	24.9	93.2	7.4	11.6	11.6	80.0
Yellow Time (s)	3.0	3.8	3.0	3.0	3.8	3.0	3.0	4.5	3.0	3.0	3.0	4.5
All-Red Time (s)	3.4	2.7	3.3	3.6	2.7	3.4	3.3	2.0	3.6	3.4	3.4	2.0
Lost Time Adjust (s)	-1.4	-1.5	-1.3	-1.6	-1.5	-1.4	-1.3	-1.5	-1.6		-1.4	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?				Yes		Yes			Yes	Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	45.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	None	None	C-Min
Walk Time (s)		7.0			7.0			7.0				7.0
Flash Dont Walk (s)		30.0			27.0			29.0				23.0
Pedestrian Calls (#/hr)		0			0			0				0
Act Effct Green (s)	17.3	22.5	56.1	9.4	14.6	34.8	128.1	112.9	127.3		128.1	99.5

Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	137
Future Volume (vph)	137
Ideal Flow (vphpl)	1900
Storage Length (ft)	100
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1568
Flt Permitted	
Satd. Flow (perm)	1568
Right Turn on Red	Yes
Satd. Flow (RTOR)	98
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Growth Factor	100%
Heavy Vehicles (%)	3%
Adj. Flow (vph)	152
Shared Lane Traffic (%)	
Lane Group Flow (vph)	152
Turn Type	pm+ov
Protected Phases	7
Permitted Phases	6
Detector Phase	7
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	13.4
Total Split (s)	21.7
Total Split (%)	12.1%
Maximum Green (s)	15.3
Yellow Time (s)	3.0
All-Red Time (s)	3.4
Lost Time Adjust (s)	-1.4
Total Lost Time (s)	5.0
Lead/Lag	Lead
Lead-Lag Optimize?	
Vehicle Extension (s)	2.0
Minimum Gap (s)	2.0
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	None
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	121.8

Build (2030) PM.syn — VHB

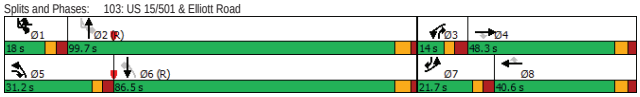
UNC DP TIA 2023 — Build (2030) PM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Actuated g/C Ratio	0.10	0.12	0.31	0.05	0.08	0.19	0.71	0.63	0.71		0.71	0.55
v/c Ratio	0.74	0.40	0.49	0.40	0.60	0.38	0.67	0.77	0.17		0.54	0.73
Control Delay	103.3	76.4	39.4	89.3	95.4	14.4	52.1	17.1	1.0		44.0	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0		0.0	0.0
Total Delay	103.3	76.4	39.4	89.3	95.4	14.4	52.1	18.0	1.0		44.0	23.1
LOS	F	E	D	F	F	B	D	B	A		D	C
Approach Delay		63.3			53.7			20.4				22.7
Approach LOS		E			D			C				C
Queue Length 50th (ft)	143	102	188	42	105	22	180	296	6		82	337
Queue Length 95th (ft)	#254	164	258	73	167	87	m250	m679	m7		m152	297
Internal Link Dist (ft)		748			567			712				1296
Turn Bay Length (ft)	525		150	350		150	350		175		225	
Base Capacity (vph)	176	448	539	181	368	422	379	2199	1149		232	1937
Starvation Cap Reductn	0	0	0	0	0	0	0	232	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.70	0.21	0.48	0.39	0.24	0.38	0.66	0.86	0.17		0.53	0.73

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 32 (18%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 27.9 — Intersection LOS: C
Intersection Capacity Utilization 80.4% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 103: US 15/501 & Elliott Road



UNC DP TIA 2023 — Build (2030) PM
103: US 15/501 & Elliott Road — Lanes, Volumes, Timings

Lane Group	SBR
Actuated g/C Ratio	0.68
v/c Ratio	0.14
Control Delay	2.1
Queue Delay	0.0
Total Delay	2.1
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	12
Queue Length 95th (ft)	m5
Internal Link Dist (ft)	
Turn Bay Length (ft)	100
Base Capacity (vph)	1099
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.14

Intersection Summary

UNC DP TIA 2023 — Build (2030) PM
104: US 15/501 & Eastgate/Ephesus Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	53	127	265	79	26	190	1296	248	63	1022	27
Future Volume (vph)	124	53	127	265	79	26	190	1296	248	63	1022	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	260		200	220		0
Storage Lanes	1		0	2		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	0.99				0.99		1.00		0.98	1.00	1.00	
Frt		0.894			0.963				0.850		0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1649	0	3400	1763	0	1752	3505	1568	1752	3489	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1726	1649	0	3400	1763	0	1751	3505	1536	1752	3489	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57			8				185		2	
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		448			1242			1376			811	
Travel Time (s)		12.2			33.9			20.8			12.3	
Confl. Peds. (#/hr)	10					10	1		1	1		1
Confl. Bikes (#/hr)						2						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	138	59	141	294	88	29	211	1440	276	70	1136	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	200	0	294	117	0	211	1440	276	70	1166	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Free	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									Free			
Detector Phase	3	8		7	4		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	20.0	36.9		33.8	37.7		20.0	80.0		18.0	68.0	
Total Split (s)	30.0	36.9		33.8	40.7		34.0	91.3		18.0	75.3	
Total Split (%)	16.7%	20.5%		18.8%	22.6%		18.9%	50.7%		10.0%	41.8%	
Maximum Green (s)	23.6	30.0		27.0	34.0		27.2	84.5		11.3	68.6	
Yellow Time (s)	3.0	3.0		3.0	3.8		3.0	4.5		3.0	4.5	
All-Red Time (s)	3.4	3.9		3.8	2.9		3.8	2.3		3.7	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	6.9		6.8	6.7		6.8	6.8		6.7	6.7	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		3.0	2.0		4.0	6.0		2.0	6.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	60.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	

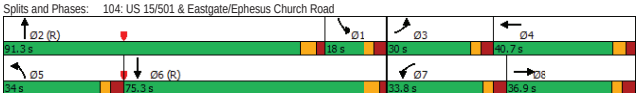
UNC DP TIA 2023 — Build (2030) PM
104: US 15/501 & Eastgate/Ephesus Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Flash Dont Walk (s)		23.0			24.0			17.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	18.2	21.4		20.8	24.6		26.6	99.3	180.0	11.3	84.0	
Actuated g/C Ratio	0.10	0.12		0.12	0.14		0.15	0.55	1.00	0.06	0.47	
v/c Ratio	0.78	0.81		0.75	0.47		0.81	0.74	0.18	0.64	0.72	
Control Delay	106.9	78.8		89.0	71.8		110.7	32.3	0.2	95.6	35.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	106.9	78.8		89.0	71.8		110.7	32.3	0.2	95.6	35.5	
LOS	F	E		F	E		F	C	A	F	D	
Approach Delay		90.3			84.1			36.3			38.9	
Approach LOS		F			F			D			D	
Queue Length 50th (ft)	162	170		176	121		263	407	0	81	462	
Queue Length 95th (ft)	238	257		225	183		m#350	657	0	m#150	584	
Internal Link Dist (ft)		368			1162			1296			731	
Turn Bay Length (ft)				200			260		200	220		
Base Capacity (vph)	229	323		510	339		277	1933	1536	109	1628	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.60	0.62		0.58	0.35		0.76	0.74	0.18	0.64	0.72	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 24 (13%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 46.8 — Intersection LOS: D
Intersection Capacity Utilization 82.5% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 104: US 15/501 & Eastgate/Ephesus Church Road



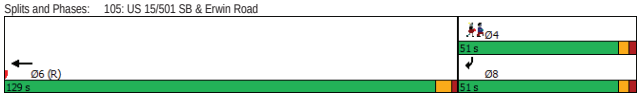
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Lane Configurations							
Traffic Volume (vph)	0	0	1689	493	0	426	
Future Volume (vph)	0	0	1689	493	0	426	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0			0	0	300	
Storage Lanes	0			1	0	1	
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.88	
Ped Bike Factor							
Frt				0.850		0.850	
Flt Protected							
Satd. Flow (prot)	0	0	5036	1568	0	2760	
Flt Permitted							
Satd. Flow (perm)	0	0	5036	1568	0	2760	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				175		46	
Link Speed (mph)		45	45		35		
Link Distance (ft)		777	779		938		
Travel Time (s)		11.8	11.8		18.3		
Confl. Peds. (#/hr)					4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	
Adj. Flow (vph)	0	0	1877	548	0	473	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	1877	548	0	473	
Turn Type			NA	Free		Prot	
Protected Phases			6			8	4
Permitted Phases				Free			
Detector Phase			6			8	
Switch Phase							
Minimum Initial (s)			12.0			7.0	7.0
Minimum Split (s)			117.0			27.4	15.0
Total Split (s)			129.0			51.0	51.0
Total Split (%)			71.7%			28.3%	28%
Maximum Green (s)			122.8			45.6	45.6
Yellow Time (s)			4.5			3.0	3.0
All-Red Time (s)			1.7			2.4	2.4
Lost Time Adjust (s)			0.0			0.0	
Total Lost Time (s)			6.2			5.4	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)			6.0			0.2	1.0
Minimum Gap (s)			2.0			2.0	2.0
Time Before Reduce (s)			15.0			0.0	0.0
Time To Reduce (s)			45.0			0.0	0.0
Recall Mode			C-Max			None	None
Walk Time (s)						7.0	
Flash Dont Walk (s)						15.0	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Pedestrian Calls (#/hr)						0	
Act Effct Green (s)			137.0	180.0		31.4	
Actuated g/C Ratio			0.76	1.00		0.17	
v/c Ratio			0.49	0.35		0.91	
Control Delay			3.5	0.5		88.0	
Queue Delay			0.3	0.0		0.0	
Total Delay			3.8	0.5		88.0	
LOS			A	A		F	
Approach Delay			3.0		88.0		
Approach LOS			A		F		
Queue Length 50th (ft)			98	0		288	
Queue Length 95th (ft)			333	0		348	
Internal Link Dist (ft)		697	699		858		
Turn Bay Length (ft)						300	
Base Capacity (vph)			3833	1568		733	
Starvation Cap Reductn			1038	0		0	
Spillback Cap Reductn			0	0		0	
Storage Cap Reductn			0	0		0	
Reduced v/c Ratio			0.67	0.35		0.65	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 16 (9%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 16.9 Intersection LOS: B
Intersection Capacity Utilization 58.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 105: US 15/501 SB & Erwin Road



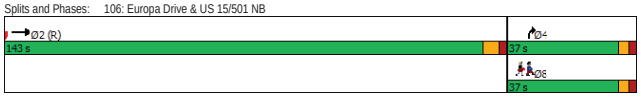
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Lane Configurations							
Traffic Volume (vph)	2541	87	0	0	0	267	
Future Volume (vph)	2541	87	0	0	0	267	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		250	0		0	0	
Storage Lanes		1	0		0	2	
Taper Length (ft)			25		25		
Lane Util. Factor	0.86	1.00	1.00	1.00	1.00	0.88	
Ped Bike Factor							
Frt		0.850				0.850	
Flt Protected							
Satd. Flow (prot)	6408	1583	0	0	0	2787	
Flt Permitted							
Satd. Flow (perm)	6408	1583	0	0	0	2787	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		26				11	
Link Speed (mph)	45			45	25		
Link Distance (ft)	764			605	662		
Travel Time (s)	11.6			9.2	18.1		
Confl. Peds. (#/hr)					4	4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	2823	97	0	0	0	297	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	2823	97	0	0	0	297	
Turn Type	NA	Free				Prot	
Protected Phases	2					4	8
Permitted Phases		Free					
Detector Phase	2					4	
Switch Phase							
Minimum Initial (s)	12.0					7.0	7.0
Minimum Split (s)	126.0					26.0	28.3
Total Split (s)	143.0					37.0	37.0
Total Split (%)	79.4%					20.6%	21%
Maximum Green (s)	136.2					31.7	31.7
Yellow Time (s)	4.5					3.0	3.0
All-Red Time (s)	2.3					2.3	2.3
Lost Time Adjust (s)	0.0					0.0	
Total Lost Time (s)	6.8					5.3	
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	6.0					1.0	0.2
Minimum Gap (s)	2.0					2.0	2.0
Time Before Reduce (s)	15.0					0.0	0.0
Time To Reduce (s)	45.0					0.0	0.0
Recall Mode	C-Max					None	None
Walk Time (s)							7.0
Flash Dont Walk (s)							16.0
Pedestrian Calls (#/hr)							2
Act Effct Green (s)	145.9	180.0				22.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø8
Actuated g/C Ratio	0.81	1.00				0.12	
v/c Ratio	0.54	0.06				0.85	
Control Delay	2.4	0.0				95.8	
Queue Delay	0.3	0.0				0.0	
Total Delay	2.7	0.0				95.8	
LOS	A	A				F	
Approach Delay	2.6				95.8		
Approach LOS	A				F		
Queue Length 50th (ft)	88	0				191	
Queue Length 95th (ft)	103	m0				246	
Internal Link Dist (ft)	684			525	582		
Turn Bay Length (ft)		250					
Base Capacity (vph)	5194	1583				499	
Starvation Cap Reductn	1360	0				0	
Spillback Cap Reductn	0	0				0	
Storage Cap Reductn	0	0				0	
Reduced v/c Ratio	0.74	0.06				0.60	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 163 (91%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 11.2 Intersection LOS: B
Intersection Capacity Utilization 56.7% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 106: Europa Drive & US 15/501 NB



UNC DP TIA 2023 — Build (2030) PM
107: NB/EB U-Turn & US 15/501 SB — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1758	380	0
Future Volume (vph)	0	0	0	1758	380	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Right Turn on Red		Yes			Yes	Yes
Satd. Flow (RTOR)					68	
Link Speed (mph)	45			45	35	
Link Distance (ft)	779			295	205	
Travel Time (s)	11.8			4.5	4.0	
Confl. Bikes (#/hr)		3				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1953	422	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1953	422	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				12.0	7.0	
Minimum Split (s)				18.7	13.5	
Total Split (s)				143.0	37.0	
Total Split (%)				79.4%	20.6%	
Maximum Green (s)				136.3	30.5	
Yellow Time (s)				4.7	4.0	
All-Red Time (s)				2.0	2.5	
Lost Time Adjust (s)				-1.7	-1.5	
Total Lost Time (s)				5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				6.0	5.0	
Minimum Gap (s)				3.0	0.2	
Time Before Reduce (s)				15.0	0.0	
Time To Reduce (s)				45.0	0.0	
Recall Mode				C-Min	None	
Act Effct Green (s)				142.7	27.3	
Actuated g/C Ratio				0.79	0.15	
v/c Ratio				0.70	0.73	
Control Delay				9.7	67.1	
Queue Delay				0.1	0.0	
Total Delay				9.8	67.1	
LOS				A	E	

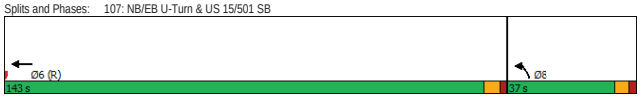
UNC DP TIA 2023 — Build (2030) PM
107: NB/EB U-Turn & US 15/501 SB — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach Delay				9.8	67.1	
Approach LOS				A	E	
Queue Length 50th (ft)				476	206	
Queue Length 95th (ft)				m68	271	
Internal Link Dist (ft)	699			215	125	
Turn Bay Length (ft)						
Base Capacity (vph)				2805	666	
Starvation Cap Reductn				163	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.74	0.63	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 145 (81%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 20.0 — Intersection LOS: B
Intersection Capacity Utilization 119.8% — ICU Level of Service H
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107: NB/EB U-Turn & US 15/501 SB



UNC DP TIA 2023 — Build (2030) PM
108: US 15/501 NB & SB/WB U-Turn — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2538	0	0	0	0	0	0	0	62	102	0
Future Volume (vph)	0	2538	0	0	0	0	0	0	0	62	102	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected										0.950		
Satd. Flow (prot)	0	3539	0	0	0	0	0	0	0	3433	1863	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	3539	0	0	0	0	0	0	0	3433	1863	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										19		
Link Speed (mph)		45			45			30			35	
Link Distance (ft)		1186			764			262			186	
Travel Time (s)		18.0			11.6			6.0			3.6	
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.90	0.90	0.92	0.92	0.90	0.90	0.92	0.92	0.92	0.90	0.92	0.90
Adj. Flow (vph)	0	2820	0	0	0	0	0	0	0	69	111	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2820	0	0	0	0	0	0	0	69	111	0
Turn Type		NA								Split	NA	
Protected Phases		2								4	4	
Permitted Phases												
Detector Phase		2								4	4	
Switch Phase												
Minimum Initial (s)		12.0								7.0	7.0	
Minimum Split (s)		150.0								30.0	30.0	
Total Split (s)		150.0								30.0	30.0	
Total Split (%)		83.3%								16.7%	16.7%	
Maximum Green (s)		143.8								24.0	24.0	
Yellow Time (s)		4.7								4.0	4.0	
All-Red Time (s)		1.5								2.0	2.0	
Lost Time Adjust (s)		-1.2								-1.0	0.0	
Total Lost Time (s)		5.0								5.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0								1.0	1.0	
Minimum Gap (s)		2.0								2.0	2.0	
Time Before Reduce (s)		15.0								0.0	0.0	
Time To Reduce (s)		45.0								0.0	0.0	
Recall Mode		C-Max								None	None	
Act Effct Green (s)		154.8								15.2	14.2	
Actuated g/C Ratio		0.86								0.08	0.08	
v/c Ratio		0.93								0.23	0.76	
Control Delay		16.8								56.3	110.7	
Queue Delay		0.0								0.0	0.0	
Total Delay		16.8								56.3	110.7	
LOS		B								E	F	

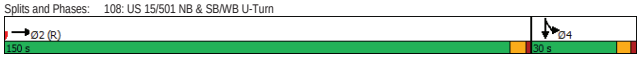
UNC DP TIA 2023 — Build (2030) PM
108: US 15/501 NB & SB/WB U-Turn — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		16.8									89.8	
Approach LOS		B									F	
Queue Length 50th (ft)		1028								28	130	
Queue Length 95th (ft)		584								m57	202	
Internal Link Dist (ft)		1106			684			182			106	
Turn Bay Length (ft)												
Base Capacity (vph)		3044								493	248	
Starvation Cap Reductn		0								0	0	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.93								0.14	0.45	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 152 (84%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 21.2 — Intersection LOS: C
Intersection Capacity Utilization 85.2% — ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 108: US 15/501 NB & SB/WB U-Turn



UNC DP TIA 2023 — Build (2030) PM
109: Old Durham-CH Road/Sage Road & US 15/501 — Lanes, Volumes, Timings

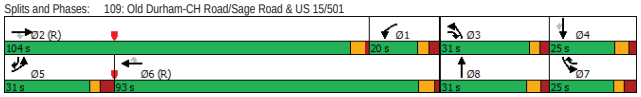
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	397	1711	267	89	1405	257	223	189	30	198	180	127
Future Volume (vph)	397	1711	267	89	1405	257	223	189	30	198	180	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	240		100	220		200	100		0	150		100
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.98				0.99	1.00				0.98
Frt			0.850			0.850		0.980				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	3505	1568	1752	3505	1568	1752	1804	0	3400	1845	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	3505	1536	1752	3505	1568	1741	1804	0	3400	1845	1540
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94			77		4				95
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		829			1831			1573			1089	
Travel Time (s)		12.6			27.7			30.6			21.2	
Confl. Peds. (#/hr)							4					4
Confl. Bikes (#/hr)			1						1			1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	441	1901	297	99	1561	286	248	210	33	220	200	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	441	1901	297	99	1561	286	248	243	0	220	200	141
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	25.0	89.0	25.0	20.0	65.0	25.0	25.0	25.0		25.0	25.0	25.0
Total Split (s)	31.0	104.0	31.0	20.0	93.0	25.0	31.0	31.0		25.0	25.0	31.0
Total Split (%)	17.2%	57.8%	17.2%	11.1%	51.7%	13.9%	17.2%	17.2%		13.9%	13.9%	17.2%
Maximum Green (s)	24.1	98.3	25.1	13.7	86.9	18.3	25.1	24.4		18.3	18.6	24.1
Yellow Time (s)	3.0	4.4	3.0	3.0	4.5	3.0	3.0	4.1		3.0	4.1	3.0
All-Red Time (s)	3.9	1.3	2.9	3.3	1.6	3.7	2.9	2.5		3.7	2.3	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.9	5.7	5.9	6.3	6.1	6.7	5.9	6.6		6.7	6.4	6.9
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	4.0	1.0	6.0	1.0	4.0	4.0		1.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Time Before Reduce (s)	0.0	15.0	0.0	0.0	15.0	0.0	0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	45.0	0.0	0.0	45.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	24.0	98.3	123.2	13.7	87.0	104.7	25.1	24.4		18.3	18.6	42.1

UNC DP TIA 2023 — Build (2030) PM
109: Old Durham-CH Road/Sage Road & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.13	0.55	0.68	0.08	0.48	0.58	0.14	0.14		0.10	0.10	0.23
v/c Ratio	0.97	0.99	0.27	0.74	0.92	0.30	1.02	0.98		0.64	1.05	0.32
Control Delay	103.9	57.8	4.4	93.8	39.9	6.2	135.3	126.1		86.8	153.1	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	103.9	57.8	4.4	93.8	39.9	6.2	135.3	126.1		86.8	153.1	20.1
LOS	F	E	A	F	D	A	F	F		F	F	C
Approach Delay		59.5			37.7			130.8			93.6	
Approach LOS		E			D			F			F	
Queue Length 50th (ft)	270	975	48	111	424	66	~308	287		130	~256	41
Queue Length 95th (ft)	#390	#1320	68	m#168	816	173	#503	#482		180	#437	105
Internal Link Dist (ft)		749			1751			1493			1009	
Turn Bay Length (ft)	240		100	220		200	100			150		100
Base Capacity (vph)	455	1914	1085	133	1693	944	244	248		345	190	437
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.97	0.99	0.27	0.74	0.92	0.30	1.02	0.98		0.64	1.05	0.32

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 144 (80%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 160
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 61.6 — Intersection LOS: E
Intersection Capacity Utilization 95.2% — ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 109: Old Durham-CH Road/Sage Road & US 15/501



UNC DP TIA 2023 — Build (2030) PM
110: BCBS/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

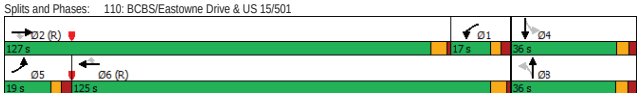
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	1928	16	96	1659	51	6	29	88	130	28	100
Future Volume (vph)	33	1928	16	96	1659	51	6	29	88	130	28	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220		100	220		250	100		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98			0.98						
Frt			0.850			0.850		0.887			0.883	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	1636	0	1752	1629	0
Flt Permitted	0.950			0.950			0.496			0.535		
Satd. Flow (perm)	1752	3505	1536	1752	3505	1536	915	1636	0	987	1629	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			54		73			86	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		1831			1555			278			606	
Travel Time (s)		27.7			23.6			7.6			16.5	
Confl. Bikes (#/hr)			1			1						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	37	2142	18	107	1843	57	7	32	98	144	31	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	2142	18	107	1843	57	7	130	0	144	142	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	19.0	127.0	127.0	17.0	108.0	108.0	36.0	36.0		36.0	36.0	
Total Split (s)	19.0	127.0	127.0	17.0	125.0	125.0	36.0	36.0		36.0	36.0	
Total Split (%)	10.6%	70.6%	70.6%	9.4%	69.4%	69.4%	20.0%	20.0%		20.0%	20.0%	
Maximum Green (s)	13.2	121.3	121.3	11.2	119.1	119.1	29.9	29.9		30.1	30.1	
Yellow Time (s)	3.0	4.6	4.6	3.0	4.6	4.6	3.3	3.3		3.6	3.6	
All-Red Time (s)	2.8	1.1	1.1	2.8	1.3	1.3	2.8	2.8		2.3	2.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.8	5.7	5.7	5.8	5.9	5.9	6.1	6.1		5.9	5.9	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	6.0	1.0	6.0	6.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	50.0	50.0	0.0	50.0	50.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Walk Time (s)										7.0	7.0	
Flash Dont Walk (s)										23.0	23.0	

UNC DP TIA 2023 — Build (2030) PM
110: BCBS/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)										2	2	
Act Effct Green (s)	8.1	123.4	123.4	11.2	128.8	128.8	27.8	27.8		28.0	28.0	
Actuated g/C Ratio	0.04	0.69	0.69	0.06	0.72	0.72	0.15	0.15		0.16	0.16	
v/c Ratio	0.47	0.89	0.02	0.98	0.74	0.05	0.05	0.41		0.94	0.44	
Control Delay	112.6	5.0	0.0	124.1	1.6	0.1	64.3	34.0		130.7	31.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	112.6	5.0	0.0	124.1	1.6	0.1	64.3	34.0		130.7	31.5	
LOS	F	A	A	F	A	A	E	C		F	C	
Approach Delay		6.8			8.1			35.5			81.4	
Approach LOS		A			A			D			F	
Queue Length 50th (ft)	45	171	0	134	6	1	7	59		169	58	
Queue Length 95th (ft)	m47	m173	m0	m#183	7	m0	24	133		#309	134	
Internal Link Dist (ft)		1751			1475			198			526	
Turn Bay Length (ft)	220		100	220		250	100					
Base Capacity (vph)	128	2401	1070	109	2507	1114	151	332		165	344	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.29	0.89	0.02	0.98	0.74	0.05	0.05	0.39		0.87	0.41	

Intersection Summary
Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 144 (80%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 12.8 — Intersection LOS: B
Intersection Capacity Utilization 87.5% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 110: BCBS/Eastowne Drive & US 15/501



UNC DP TIA 2023 — Build (2030) PM
111: Lakeview Drive/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2141	10	86	1769	123	12	25	105	242	17	11
Future Volume (vph)	1	2141	10	86	1769	123	12	25	105	242	17	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		125	0		0	150		0	200		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00							1.00	
Frt		0.999				0.850		0.879			0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	5030	0	1752	3505	1568	1752	1621	0	1752	1729	0
Flt Permitted	0.950			0.950			0.737			0.585		
Satd. Flow (perm)	1752	5030	0	1752	3505	1568	1360	1621	0	1079	1729	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				70		114			12	
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		1555			959			495			676	
Travel Time (s)		23.6			14.5			9.6			18.4	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	1	2379	11	96	1966	137	13	28	117	269	19	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	2390	0	96	1966	137	13	145	0	269	31	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		
Detector Phase	5	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	92.0		30.0	80.0	80.0	30.0	30.0		30.0	30.0	
Total Split (s)	15.0	96.0		30.0	111.0	111.0	54.0	54.0		54.0	54.0	
Total Split (%)	8.3%	53.3%		16.7%	61.7%	61.7%	30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	9.4	90.5		24.2	105.5	105.5	47.8	47.8		47.9	47.9	
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	3.2	3.2		3.1	3.1	
All-Red Time (s)	2.6	1.0		2.8	1.0	1.0	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.6	5.5		5.8	5.5	5.5	6.2	6.2		6.1	6.1	
Lead/Lag	Lead	Lead		Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0		1.0	6.0	6.0	1.0	1.0		2.0	2.0	
Minimum Gap (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Time Before Reduce (s)	0.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	45.0		0.0	45.0	45.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	7.0	92.2		24.2	119.7	119.7	46.1	46.1		46.2	46.2	

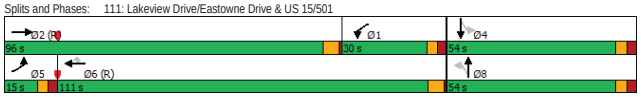
UNC DP TIA 2023 — Build (2030) PM
111: Lakeview Drive/Eastowne Drive & US 15/501 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.04	0.51		0.13	0.66	0.66	0.26	0.26		0.26	0.26	
v/c Ratio	0.01	0.93		0.41	0.84	0.13	0.04	0.29		0.97	0.07	
Control Delay	109.0	46.7		77.2	28.4	6.4	49.6	15.1		111.8	34.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	109.0	46.7		77.2	28.4	6.4	49.6	15.1		111.8	34.6	
LOS	F	D		E	C	A	D	B		F	C	
Approach Delay		46.7			29.1			17.9			103.8	
Approach LOS		D			C			B			F	
Queue Length 50th (ft)	1	769		106	876	26	12	28		314	17	
Queue Length 95th (ft)	m1	935		172	1211	66	32	92		#507	48	
Internal Link Dist (ft)		1475			879			415			596	
Turn Bay Length (ft)	150						150			200		
Base Capacity (vph)	91	2576		235	2330	1065	361	514		287	468	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.01	0.93		0.41	0.84	0.13	0.04	0.28		0.94	0.07	

Intersection Summary

Area Type: Other
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 127 (71%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 155
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 41.6 — Intersection LOS: D
Intersection Capacity Utilization 95.4% — ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 111: Lakeview Drive/Eastowne Drive & US 15/501



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
201: Hamilton Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	2377	58	63	1892	42	152	14	88	121	14	30
Future Volume (vph)	27	2377	58	63	1892	42	152	14	88	121	14	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-4%			2%			-2%	
Storage Length (ft)	200		0	200		0	0		150	100		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.99		0.97	0.98	0.99	
Frt		0.996			0.997				0.850		0.899	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	5011	0	1805	5168	0	1752	1844	1567	1787	1669	0
Flt Permitted	0.054			0.054			0.725			0.747		
Satd. Flow (perm)	100	5011	0	103	5168	0	1327	1844	1518	1378	1669	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		4			4							
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		895			935			499			486	
Travel Time (s)		13.6			14.2			9.7			9.5	
Confl. Peds. (#/hr)	4		2	2		4	7		19	19		7
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	30	2641	64	70	2102	47	169	16	98	134	16	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	2705	0	70	2149	0	169	16	98	134	49	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	6			2			8		8	4		
Detector Phase	5	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	12.6	28.7		12.4	25.9		41.0	41.0	12.4	39.6	39.6	
Total Split (s)	12.7	66.2		12.8	66.3		41.0	41.0	12.8	41.0	41.0	
Total Split (%)	10.6%	55.2%		10.7%	55.3%		34.2%	34.2%	10.7%	34.2%	34.2%	
Maximum Green (s)	7.1	60.5		7.4	60.6		34.7	34.7	7.4	34.4	34.4	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.7	3.7	3.0	3.2	3.2	
All-Red Time (s)	2.6	1.7		2.4	1.7		2.6	2.6	2.4	3.4	3.4	
Lost Time Adjust (s)	-0.6	-0.6		-0.4	-0.9		-1.4	-1.4	-0.4	-1.5	-1.5	
Total Lost Time (s)	5.0	5.1		5.0	4.8		4.9	4.9	5.0	5.1	5.1	
Lead/Lag	Lead	Lead		Lag	Lag				Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.0		2.0	3.0		1.0	1.0	2.0	1.0	1.0	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		16.0			13.0		27.0	27.0		26.0	26.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)	86.8	77.0		84.8	82.4		20.3	20.3	27.9	20.1	20.1	
Actuated g/C Ratio	0.72	0.64		0.71	0.69		0.17	0.17	0.23	0.17	0.17	

Build (2030) PM.syn — VHB

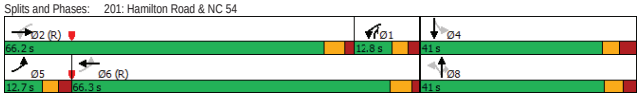
UNC DP TIA 2023 — Build (2030) PM
201: Hamilton Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.17	0.84		0.38	0.61		0.75	0.05	0.28	0.58	0.18	
Control Delay	7.5	21.1		21.7	9.7		67.1	38.4	34.3	55.0	41.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	7.5	21.1		21.7	9.7		67.1	38.4	34.3	55.0	41.5	
LOS	A	C		C	A		E	D	C	D	D	
Approach Delay		21.0			10.1			54.1			51.3	
Approach LOS		C			B			D			D	
Queue Length 50th (ft)	5	554		12	314		126	11	59	97	33	
Queue Length 95th (ft)	17	768		42	354		189	29	95	151	64	
Internal Link Dist (ft)		815			855			419			406	
Turn Bay Length (ft)	200			200					150	100		
Base Capacity (vph)	178	3215		183	3550		399	554	357	412	499	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.17	0.84		0.38	0.61		0.42	0.03	0.27	0.33	0.10	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 71 (59%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 19.3 — Intersection LOS: B
Intersection Capacity Utilization 81.7% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 201: Hamilton Road & NC 54



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
202: Finley Golf Course Road/Burning Tree Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	2771	23	208	1831	27	39	11	142	34	14	35
Future Volume (vph)	59	2771	23	208	1831	27	39	11	142	34	14	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	11	12	12	12	10	10	10
Storage Length (ft)	200		0	100		0	460		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00			0.99	
Frt		0.999			0.998				0.850		0.943	
Flt Protected	0.950			0.950				0.962			0.980	
Satd. Flow (prot)	1770	5079	0	1770	4904	0	0	1792	1583	0	1594	0
Flt Permitted	0.069			0.048				0.656			0.842	
Satd. Flow (perm)	129	5079	0	89	4904	0	0	1216	1583	0	1370	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			2				83		33	
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		651			853			632			471	
Travel Time (s)		9.9			12.9			12.3			9.2	
Confl. Peds. (#/hr)	2		7	7		2	7					7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	66	3079	26	231	2034	30	43	12	158	38	16	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	3105	0	231	2064	0	0	55	158	0	93	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	6			2			8		8	4		
Detector Phase	5	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	12.9	31.2		12.9	29.2		47.2	47.2	12.9	45.3	45.3	
Total Split (s)	13.0	58.8		14.0	59.8		47.2	47.2	14.0	47.2	47.2	
Total Split (%)	10.8%	49.0%		11.7%	49.8%		39.3%	39.3%	11.7%	39.3%	39.3%	
Maximum Green (s)	7.1	52.6		8.1	53.6		41.0	41.0	8.1	40.9	40.9	
Yellow Time (s)	3.0	4.9		3.0	4.9		3.7	3.7	3.0	3.2	3.2	
All-Red Time (s)	2.9	1.3		2.9	1.3		2.5	2.5	2.9	3.1	3.1	
Lost Time Adjust (s)	-0.9	-1.2		-0.9	-1.2			-1.2	-0.9		-1.3	
Total Lost Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lead	Lead		Lag	Lag				Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0	2.0	2.0	2.0	
Minimum Gap (s)	0.2	3.0		0.2	3.0		0.2	0.2	0.2	0.2	0.2	
Time Before Reduce (s)	0.0	20.0		0.0	20.0		0.0	0.0	0.0	0.0	0.0	
Time To Reduce (s)	0.0	40.0		0.0	40.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Min		None	C-Min		None	None	None	None	None	
Walk Time (s)		7.0			7.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		18.0			16.0		34.0	34.0		32.0	32.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	

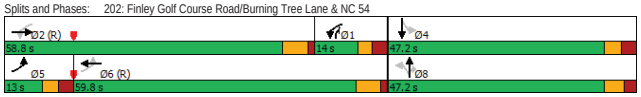
UNC DP TIA 2023 — Build (2030) PM
202: Finley Golf Course Road/Burning Tree Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	94.4	84.4		93.4	87.8			11.6	25.6		11.6	
Actuated g/C Ratio	0.79	0.70		0.78	0.73			0.10	0.21		0.10	
v/c Ratio	0.31	0.87		1.18	0.57			0.47	0.39		0.58	
Control Delay	12.5	5.4		145.3	2.2			63.4	21.7		47.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	12.5	5.5		145.3	2.2			63.4	21.7		47.6	
LOS	B	A		F	A			E	C		D	
Approach Delay		5.6			16.6			32.5			47.6	
Approach LOS		A			B			C			D	
Queue Length 50th (ft)	5	105		~165	20			41	49		45	
Queue Length 95th (ft)	m14	140		m#328	203			82	106		97	
Internal Link Dist (ft)		571			773			552			391	
Turn Bay Length (ft)	200			100								
Base Capacity (vph)	214	3574		195	3590			427	402		503	
Starvation Cap Reductn	0	4		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.31	0.87		1.18	0.57			0.13	0.39		0.18	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 102 (85%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 11.6 — Intersection LOS: B
Intersection Capacity Utilization 93.8% — ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 202: Finley Golf Course Road/Burning Tree Lane & NC 54



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	183	2433	16	8	2194	14	43	11	43	29	1	141
Future Volume (vph)	183	2433	16	8	2194	14	43	11	43	29	1	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	250		250	0		125	0		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.91			0.95						
Frt			0.850			0.850		0.880			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1639	0	1770	1585	0
Flt Permitted	0.050			0.043			0.430			0.718		
Satd. Flow (perm)	93	5085	1436	80	5085	1509	801	1639	0	1337	1585	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			96			190		48			157	
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		853			1936			433			831	
Travel Time (s)		12.9			29.3			11.8			16.2	
Confl. Peds. (#/hr)	25		26	26		25						
Confl. Bikes (#/hr)						3						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	203	2703	18	9	2438	16	48	12	48	32	1	157
Shared Lane Traffic (%)												
Lane Group Flow (vph)	203	2703	18	9	2438	16	48	60	0	32	158	0
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6		2	2		6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.3	27.3	27.3	13.3	18.3	18.3	13.8	13.8		14.3	14.3	
Total Split (s)	15.0	92.4	92.4	13.3	63.7	63.7	14.3	14.3		14.3	14.3	
Total Split (%)	12.5%	77.0%	77.0%	11.1%	53.1%	53.1%	11.9%	11.9%		11.9%	11.9%	
Maximum Green (s)	8.7	86.1	86.1	7.0	57.4	57.4	7.5	7.5		7.0	7.0	
Yellow Time (s)	3.0	4.7	4.7	3.0	4.7	4.7	3.0	3.0		3.5	3.5	
All-Red Time (s)	3.3	1.6	1.6	3.3	1.6	1.6	3.8	3.8		3.8	3.8	
Lost Time Adjust (s)	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.8	-1.8		-2.3	-2.3	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag					Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	6.0	1.0	6.0	6.0	2.0	2.0		2.0	2.0	
Minimum Gap (s)	0.2	3.0	3.0	0.2	3.0	3.0	0.2	0.2		0.2	0.2	
Time Before Reduce (s)	0.0	20.0	20.0	0.0	20.0	20.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	40.0	40.0	0.0	40.0	40.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		14.0	14.0									
Pedestrian Calls (#/hr)		0	0									

Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	Ø10
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	10
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	27.0
Total Split (s)	27.0
Total Split (%)	23%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0

Build (2030) PM.syn — VHB

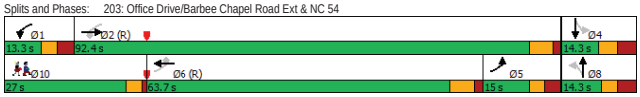
UNC DP TIA 2023 — Build (2030) PM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	95.7	98.0	98.0	99.7	85.7	85.7	9.3	9.3		9.3	9.3	
Actuated g/C Ratio	0.80	0.82	0.82	0.83	0.71	0.71	0.08	0.08		0.08	0.08	
v/c Ratio	0.95	0.65	0.02	0.05	0.67	0.01	0.77	0.35		0.31	0.59	
Control Delay	65.3	0.9	0.0	1.6	13.8	0.0	117.5	25.3		60.8	18.0	
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	65.3	1.0	0.0	1.6	13.8	0.0	117.5	25.3		60.8	18.0	
LOS	E	A	A	A	B	A	F	C		E	B	
Approach Delay		5.4			13.7			66.2			25.2	
Approach LOS		A			B			E			C	
Queue Length 50th (ft)	110	20	0	2	419	0	37	9		24	1	
Queue Length 95th (ft)	m#160	39	m0	m1	434	m0	#110	52		58	67	
Internal Link Dist (ft)		773			1856			353			751	
Turn Bay Length (ft)	250		250	250		250						
Base Capacity (vph)	213	4154	1190	183	3631	1131	62	171		103	267	
Starvation Cap Reductn	0	337	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.95	0.71	0.02	0.05	0.67	0.01	0.77	0.35		0.31	0.59	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 85 (71%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 10.8 — Intersection LOS: B
Intersection Capacity Utilization 84.1% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 203: Office Drive/Barbee Chapel Road Ext & NC 54



UNC DP TIA 2023 — Build (2030) PM
203: Office Drive/Barbee Chapel Road Ext & NC 54 — Lanes, Volumes, Timings

Lane Group	Ø10
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

UNC DP TIA 2023 — Build (2030) PM
204: Friday Center Lane/Meadowmont Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	2406	47	35	1754	107	100	17	340	119	26	157
Future Volume (vph)	116	2406	47	35	1754	107	100	17	340	119	26	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	10	12	12	12	12	12	12	12	12	12
Storage Length (ft)	250		250	250		250	0		400	225		0
Storage Lanes	2		1	2		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	1.00	0.97	1.00	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	0.98	0.99	0.99	1.00		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950	0.966		0.950		
Satd. Flow (prot)	3433	5085	1478	3433	5085	1583	1681	1709	1583	3433	1863	1583
Flt Permitted	0.950			0.950			0.950	0.966		0.950		
Satd. Flow (perm)	3431	5085	1447	3432	5085	1557	1649	1686	1560	3421	1863	1552
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			105			119			99			97
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1936			1043			1237			723	
Travel Time (s)		29.3			15.8			24.1			14.1	
Confl. Peds. (#/hr)	4		7	7		4	5		1	1		5
Confl. Bikes (#/hr)									1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	129	2673	52	39	1949	119	111	19	378	132	29	174
Shared Lane Traffic (%)							42%					
Lane Group Flow (vph)	129	2673	52	39	1949	119	64	66	378	132	29	174
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	pm+ov
Protected Phases	5	2	4	1	6	3	4	4	1	3	3	5
Permitted Phases			2			6			4			3
Detector Phase	5	2	4	1	6	3	4	4	1	3	3	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.2	34.6	14.1	14.1	38.5	14.3	14.1	14.1	14.1	14.3	14.3	14.2
Total Split (s)	18.4	70.6	14.1	21.0	73.2	14.3	14.1	14.1	21.0	14.3	14.3	18.4
Total Split (%)	15.3%	58.8%	11.8%	17.5%	61.0%	11.9%	11.8%	11.8%	17.5%	11.9%	11.9%	15.3%
Maximum Green (s)	11.2	64.0	7.0	13.9	66.7	7.0	7.0	7.0	13.9	7.0	7.0	11.2
Yellow Time (s)	3.2	4.6	3.7	3.1	4.4	4.0	3.7	3.7	3.1	4.0	4.0	3.2
All-Red Time (s)	4.0	2.0	3.4	4.0	2.1	3.3	3.4	3.4	4.0	3.3	3.3	4.0
Lost Time Adjust (s)	-2.2	-1.6	-2.1	-2.1	-1.5	-2.3	-2.1	-2.1	-2.1	-2.3	-2.3	-2.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Time Before Reduce (s)	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	C-Min	None	None	C-Min	Min	None	None	None	Min	Min	Min
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		21.0			25.0							

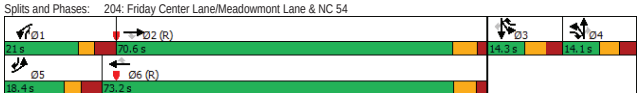
UNC DP TIA 2023 — Build (2030) PM
204: Friday Center Lane/Meadowmont Lane & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	10.5	67.4	76.5	17.0	73.9	83.2	9.1	9.1	24.3	9.3	9.3	19.8
Actuated g/C Ratio	0.09	0.56	0.64	0.14	0.62	0.69	0.08	0.08	0.20	0.08	0.08	0.16
v/c Ratio	0.43	0.94	0.05	0.08	0.62	0.11	0.50	0.51	0.95	0.50	0.20	0.51
Control Delay	59.3	22.3	0.3	39.3	17.2	2.7	67.6	67.8	68.2	59.9	55.5	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	22.3	0.3	39.3	17.2	2.7	67.6	67.8	68.2	59.9	55.5	19.9
LOS	E	C	A	D	B	A	E	E	E	E	E	B
Approach Delay		23.5			16.8			68.1			38.8	
Approach LOS		C			B			E			D	
Queue Length 50th (ft)	54	420	0	15	179	0	50	52	208	51	21	42
Queue Length 95th (ft)	m83	#704	m1	m20	439	m22	101	103	#415	84	53	96
Internal Link Dist (ft)		1856			963			1157			643	
Turn Bay Length (ft)	250		250	250		250			400	225		
Base Capacity (vph)	383	2854	962	487	3130	1117	127	129	398	266	144	375
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.94	0.05	0.08	0.62	0.11	0.50	0.51	0.95	0.50	0.20	0.46

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 95 (79%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 25.9 — Intersection LOS: C
Intersection Capacity Utilization 86.0% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 204: Friday Center Lane/Meadowmont Lane & NC 54



UNC DP TIA 2023 — Build (2030) PM
205: Barbee Chapel Road & NC 54 — Lanes, Volumes, Timings

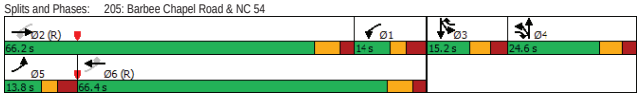
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	2258	775	149	1893	188	299	80	57	105	90	25
Future Volume (vph)	12	2258	775	149	1893	188	299	80	57	105	90	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		275	325		80	250		0	0		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Ped Bike Factor			0.97			0.98	1.00	1.00			1.00	
Frt			0.850			0.850		0.961			0.970	
Flt Protected	0.950			0.950			0.950	0.982		0.950	0.996	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1681	1670	0	1681	1704	0
Flt Permitted	0.062			0.071			0.950	0.982		0.950	0.996	
Satd. Flow (perm)	115	5085	1529	132	5085	1547	1679	1669	0	1681	1704	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			194			100		13			8	
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		1043			982			1263			745	
Travel Time (s)		15.8			14.9			19.1			14.5	
Confl. Peds. (#/hr)	1		4	4		1	1					1
Confl. Bikes (#/hr)			3									
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	2509	861	166	2103	209	332	89	63	117	100	28
Shared Lane Traffic (%)							27%			10%		
Lane Group Flow (vph)	13	2509	861	166	2103	209	242	242	0	105	140	0
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	Split	NA		Split	NA	
Protected Phases	5	2	4	1	6	3	4	4		3	3	
Permitted Phases	6		2	2		6						
Detector Phase	5	2	4	1	6	3	4	4		3	3	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.8	26.5	14.2	14.0	28.5	14.2	14.2	14.2		14.2	14.2	
Total Split (s)	13.8	66.2	24.6	14.0	66.4	15.2	24.6	24.6		15.2	15.2	
Total Split (%)	11.5%	55.2%	20.5%	11.7%	55.3%	12.7%	20.5%	20.5%		12.7%	12.7%	
Maximum Green (s)	7.0	58.7	17.4	7.0	58.9	8.0	17.4	17.4		8.0	8.0	
Yellow Time (s)	3.0	4.8	4.3	3.0	4.8	3.9	4.3	4.3		3.9	3.9	
All-Red Time (s)	3.8	2.7	2.9	4.0	2.7	3.3	2.9	2.9		3.3	3.3	
Lost Time Adjust (s)	-1.8	-2.5	-2.2	-2.0	-2.5	-2.2	-2.2	-2.2		-2.2	-2.2	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0	3.0	2.0	6.0	2.0	3.0	3.0		2.0	2.0	
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2		0.2	0.2	
Time Before Reduce (s)	0.0	20.0	0.0	0.0	20.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	40.0	0.0	0.0	40.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Min	None	None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		12.0			14.0							
Pedestrian Calls (#/hr)		0			0							

UNC DP TIA 2023 — Build (2030) PM
205: Barbee Chapel Road & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	73.2	61.2	80.8	70.2	69.7	79.9	19.6	19.6		10.2	10.2	
Actuated g/C Ratio	0.61	0.51	0.67	0.58	0.58	0.67	0.16	0.16		0.08	0.08	
v/c Ratio	0.07	0.97	0.78	0.83	0.71	0.20	0.88	0.86		0.74	0.92	
Control Delay	3.6	21.4	5.9	70.4	20.8	4.3	80.9	73.5		83.2	106.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	3.6	21.4	5.9	70.4	20.8	4.3	80.9	73.5		83.2	106.4	
LOS	A	C	A	E	C	A	F	E		F	F	
Approach Delay		17.4			22.7			77.2			96.4	
Approach LOS		B			C			E			F	
Queue Length 50th (ft)	1	394	30	72	353	19	194	184		85	108	
Queue Length 95th (ft)	m2	m#791	m74	#194	546	61	#350	#335		#178	#243	
Internal Link Dist (ft)		963			902			1183			665	
Turn Bay Length (ft)	275		275	325		80	250					
Base Capacity (vph)	191	2593	1101	200	2952	1066	274	283		142	152	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.07	0.97	0.78	0.83	0.71	0.20	0.88	0.86		0.74	0.92	

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 4 (3%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 26.7 — Intersection LOS: C
Intersection Capacity Utilization 86.7% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 205: Barbee Chapel Road & NC 54



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
208: Environ Way/Rogerson Dr & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2598	55	72	2013	0	0	0	87	0	0	2
Future Volume (vph)	0	2598	55	72	2013	0	0	0	87	0	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-4%			0%			0%	
Storage Length (ft)	0		100	250		0	0		0	0		0
Storage Lanes	0		1	1		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												0.98
Frt			0.850						0.865			0.865
Flt Protected				0.950								
Satd. Flow (prot)	0	5085	1583	1805	5187	0	0	0	1611	0	0	1611
Flt Permitted				0.042								
Satd. Flow (perm)	0	5085	1583	80	5187	0	0	0	1611	0	0	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			84						453			84
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		935			651			374			582	
Travel Time (s)		14.2			9.9			8.5			13.2	
Confl. Peds. (#/hr)	1		14	14		1	2		2	2		2
Confl. Bikes (#/hr)						2						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2887	61	80	2237	0	0	0	97	0	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2887	61	80	2237	0	0	0	97	0	0	2
Turn Type		NA	Prot	D.P+P	NA				custom			Perm
Protected Phases		2	2	1	6							
Permitted Phases				2								4
Detector Phase		2	2	1	6							4
Switch Phase												
Minimum Initial (s)		10.0	10.0	7.0	10.0							7.0
Minimum Split (s)		30.6	30.6	31.6	16.6							22.6
Total Split (s)		65.8	65.8	31.6	97.4							22.6
Total Split (%)		54.8%	54.8%	26.3%	81.2%							18.8%
Maximum Green (s)		59.2	59.2	26.0	90.8							16.0
Yellow Time (s)		4.0	4.0	3.0	4.0							4.0
All-Red Time (s)		2.6	2.6	2.6	2.6							2.6
Lost Time Adjust (s)		-1.6	-1.6	-0.6	-1.6							-1.6
Total Lost Time (s)		5.0	5.0	5.0	5.0							5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		2.0	2.0	2.0	2.0							2.0
Recall Mode		C-Max	C-Max	None	C-Min							None
Walk Time (s)		7.0	7.0	7.0								7.0
Flash Dont Walk (s)		17.0	17.0	19.0								9.0
Pedestrian Calls (#/hr)		0	0	0								0
Act Effct Green (s)		102.7	102.7	108.3	116.3				0.0			8.6
Actuated g/C Ratio		0.86	0.86	0.90	0.97				0.00			0.07

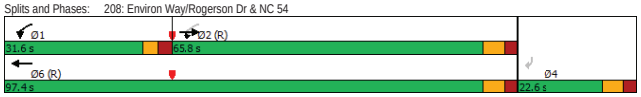
Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
208: Environ Way/Rogerson Dr & NC 54 — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.66	0.04	0.42	0.45				0.21			0.01
Control Delay		1.5	0.0	22.5	0.8				1.1			0.0
Queue Delay		0.0	0.0	0.0	0.0				0.0			0.0
Total Delay		1.5	0.0	22.5	0.8				1.1			0.0
LOS		A	A	C	A				A			A
Approach Delay		1.5			1.5			1.1				
Approach LOS		A			A			A				
Queue Length 50th (ft)		31	0	16	0				0			0
Queue Length 95th (ft)		77	m0	m59	118				0			0
Internal Link Dist (ft)		855			571			294			502	
Turn Bay Length (ft)			100	250								
Base Capacity (vph)		4350	1366	457	5026				453			304
Starvation Cap Reductn		0	0	0	185				0			0
Spillback Cap Reductn		31	0	0	0				2			0
Storage Cap Reductn		0	0	0	0				0			0
Reduced v/c Ratio		0.67	0.04	0.18	0.46				0.22			0.01

Intersection Summary
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 72 (60%), Referenced to phase 2:EBWB and 6:WBT, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 1.5 — Intersection LOS: A
Intersection Capacity Utilization 64.6% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 208: Environ Way/Rogerson Dr & NC 54



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
301: Columbia Street & Culbreth Road/Mt Carmel Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	85	51	23	85	405	48	917	6	558	1539	196
Future Volume (vph)	106	85	51	23	85	405	48	917	6	558	1539	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	200		115	380		415	100		95	491		207
Storage Lanes	1		1	0		2	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950				0.989		0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	0	1916	2898	1787	3575	1599	1752	3504	1567
Flt Permitted	0.950				0.200		0.141			0.117		
Satd. Flow (perm)	1743	1835	1560	0	387	2898	265	3575	1599	216	3504	1567
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			151			450			153			159
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		950			859			2346			550	
Travel Time (s)		18.5			16.7			45.7			10.7	
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)												3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	118	94	57	26	94	450	53	1019	7	620	1710	218
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	94	57	0	120	450	53	1019	7	620	1710	218
Turn Type	custom	NA	Perm	Perm	NA	Prot	Perm	NA	Perm	pm+pt	NA	Prot
Protected Phases	4	4			3	3		2		1	6	6
Permitted Phases	4		4	3			2		2	6		
Detector Phase	4	4	4	3	3	3	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	12.0	7.0	12.0	12.0
Minimum Split (s)	13.4	13.4	13.4	13.9	13.9	13.9	18.2	18.2	18.2	12.1	25.2	25.2
Total Split (s)	13.4	13.4	13.4	32.0	32.0	32.0	34.6	34.6	34.6	30.0	64.6	64.6
Total Split (%)	12.2%	12.2%	12.2%	29.1%	29.1%	29.1%	31.5%	31.5%	31.5%	27.3%	58.7%	58.7%
Maximum Green (s)	7.0	7.0	7.0	25.1	25.1	25.1	28.4	28.4	28.4	24.9	59.1	59.1
Yellow Time (s)	4.2	4.2	4.2	4.5	4.5	4.5	4.7	4.7	4.7	3.0	4.3	4.3
All-Red Time (s)	2.2	2.2	2.2	2.4	2.4	2.4	1.5	1.5	1.5	2.1	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4		6.9	6.9	6.2	6.2	6.2	5.1	5.5	5.5
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	6.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	15.0	0.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	45.0	45.0	45.0	0.0	45.0	45.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)											7.0	7.0
Flash Dont Walk (s)											12.0	12.0

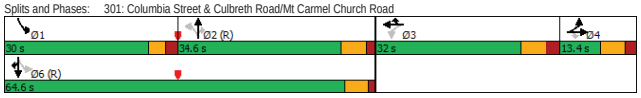
Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
301: Columbia Street & Culbreth Road/Mt Carmel Church Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Pedestrian Calls (#/hr)											0	0
Act Effct Green (s)	7.0	7.0	7.0		25.1	25.1	28.4	28.4	28.4	59.5	59.1	59.1
Actuated g/C Ratio	0.06	0.06	0.06		0.23	0.23	0.26	0.26	0.26	0.54	0.54	0.54
v/c Ratio	1.07	0.81	0.24		1.36	0.45	0.78	1.10	0.01	1.34	0.91	0.24
Control Delay	156.3	95.8	2.3		255.8	4.8	95.4	97.0	0.0	196.8	29.8	7.0
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Total Delay	156.3	95.8	2.3		255.8	4.8	95.4	97.0	0.0	196.8	30.1	7.0
LOS	F	F	A		F	A	F	F	A	F	C	A
Approach Delay		102.5			57.7			96.3			68.7	
Approach LOS		F			E			F			E	
Queue Length 50th (ft)	~92	67	0		~112	0	32	~427	0	~537	405	26
Queue Length 95th (ft)	#210	#160	0		#231	44	#113	#565	m0	#755	#555	m82
Internal Link Dist (ft)		870			779			2266			470	
Turn Bay Length (ft)	200		115			415	100		95	491		207
Base Capacity (vph)	110	116	240		88	1008	68	923	526	464	1882	915
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	22	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.81	0.24		1.36	0.45	0.78	1.10	0.01	1.34	0.92	0.24

Intersection Summary
Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 39 (35%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.36
Intersection Signal Delay: 76.0 — Intersection LOS: E
Intersection Capacity Utilization 83.8% — ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 301: Columbia Street & Culbreth Road/Mt Carmel Church Road



Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
302: Columbia Street & Arlen Park Drive/Bennett Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	13	3	81	16	4	14	796	118	58	1436	119
Future Volume (vph)	72	13	3	81	16	4	14	796	118	58	1436	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	350		350	350		350
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00							0.98			
Frt		0.974			0.973				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1810	0	1770	1812	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.743			0.746			0.950			0.950		
Satd. Flow (perm)	1384	1810	0	1390	1812	0	1770	3539	1550	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			4				131			132
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		358			1313			2727			2346	
Travel Time (s)		9.8			25.6			53.1			45.7	
Confl. Bikes (#/hr)			1						1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	80	14	3	90	18	4	16	884	131	64	1596	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	80	17	0	90	22	0	16	884	131	64	1596	132
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	36.6	36.6		14.1	14.1		13.6	20.6	20.6	12.9	24.6	24.6
Total Split (s)	36.6	36.6		36.6	36.6		13.6	58.0	58.0	15.4	59.8	59.8
Total Split (%)	33.3%	33.3%		33.3%	33.3%		12.4%	52.7%	52.7%	14.0%	54.4%	54.4%
Maximum Green (s)	30.0	30.0		29.5	29.5		7.0	51.4	51.4	9.5	53.2	53.2
Yellow Time (s)	3.2	3.2		3.8	3.8		3.0	4.6	4.6	3.0	4.6	4.6
All-Red Time (s)	3.4	3.4		3.3	3.3		3.6	2.0	2.0	2.9	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6		7.1	7.1		6.6	6.6	6.6	5.9	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		1.0	1.0		2.0	6.0	6.0	1.0	6.0	6.0
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	25.0	25.0	0.0	25.0	25.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	55.0	55.0	0.0	55.0	55.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	4.0	4.0									7.0	7.0
Flash Dont Walk (s)	26.0	26.0									10.0	10.0
Pedestrian Calls (#/hr)	0	0									0	0
Act Effct Green (s)	11.4	11.4		11.0	11.0		7.0	77.8	77.8	8.3	83.9	83.9

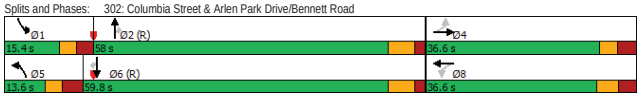
Build (2030) PM.syn — VHB

UNC DP TIA 2023 — Build (2030) PM
302: Columbia Street & Arlen Park Drive/Bennett Road — Lanes, Volumes, Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.06	0.71	0.71	0.08	0.76	0.76
v/c Ratio	0.56	0.09		0.65	0.12		0.14	0.35	0.12	0.48	0.59	0.11
Control Delay	60.8	37.9		68.0	38.5		40.6	12.6	5.1	75.6	4.1	0.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.8	37.9		68.0	38.5		40.6	12.6	5.1	75.6	4.1	0.4
LOS	E	D		E	D		D	B	A	E	A	A
Approach Delay		56.8			62.2			12.1			6.4	
Approach LOS		E			E			B			A	
Queue Length 50th (ft)	55	9		62	12		9	174	7	49	8	0
Queue Length 95th (ft)	100	29		111	35		m25	271	m30	m48	m601	m5
Internal Link Dist (ft)		278			1233			2647			2266	
Turn Bay Length (ft)	150			150			350		350	350		350
Base Capacity (vph)	377	495		372	488		113	2504	1135	157	2700	1239
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.03		0.24	0.05		0.14	0.35	0.12	0.41	0.59	0.11

Intersection Summary
Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 80 (73%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 12.0 — Intersection LOS: B
Intersection Capacity Utilization 70.8% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 302: Columbia Street & Arlen Park Drive/Bennett Road



Build (2030) PM.syn — VHB

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	318	120	138	557	11	1271	311
Future Volume (vph)	318	120	138	557	11	1271	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0	350		250		350
Storage Lanes	1	1	1		1		1
Taper Length (ft)	25		25		25		
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor		0.99					
Frt		0.850					0.850
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1770	1583	1770	3539	1770	3539	1583
Flt Permitted	0.950		0.950		0.417		
Satd. Flow (perm)	1770	1563	1770	3539	777	3539	1583
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		133					346
Link Speed (mph)	25			35		35	
Link Distance (ft)	416			1017		2727	
Travel Time (s)	11.3			19.8		53.1	
Confl. Bikes (#/hr)		1					
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	353	133	153	619	12	1412	346
Shared Lane Traffic (%)							
Lane Group Flow (vph)	353	133	153	619	12	1412	346
Turn Type	Prot	Perm	Prot	NA	Perm	NA	Perm
Protected Phases	4		5	2		6	
Permitted Phases		4			6		6
Detector Phase	4	4	5	2	6	6	6
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	12.0	12.0
Minimum Split (s)	13.1	13.1	12.8	20.4	20.0	20.0	20.0
Total Split (s)	34.0	34.0	19.0	76.0	57.0	57.0	57.0
Total Split (%)	30.9%	30.9%	17.3%	69.1%	51.8%	51.8%	51.8%
Maximum Green (s)	27.9	27.9	13.2	69.6	51.0	51.0	51.0
Yellow Time (s)	3.0	3.0	3.0	5.0	4.6	4.6	4.6
All-Red Time (s)	3.1	3.1	2.8	1.4	1.4	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	5.8	6.4	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	1.0	6.0	6.0	6.0	6.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	15.0	15.0	15.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	40.0	45.0	45.0	45.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	25.4	25.4	11.7	72.1	55.0	55.0	55.0
Actuated g/C Ratio	0.23	0.23	0.11	0.66	0.50	0.50	0.50
v/c Ratio	0.87	0.29	0.81	0.27	0.03	0.80	0.36
Control Delay	62.0	7.4	78.6	8.6	7.4	11.1	1.3

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.0	7.4	78.6	8.6	7.4	11.1	1.3
LOS	E	A	E	A	A	B	A
Approach Delay	47.0			22.5		9.2	
Approach LOS	D			C		A	
Queue Length 50th (ft)	234	0	105	93	1	284	5
Queue Length 95th (ft)	#372	47	#200	123	m4	292	17
Internal Link Dist (ft)	336			937		2647	
Turn Bay Length (ft)	150		350		250		350
Base Capacity (vph)	448	495	213	2321	388	1769	964
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.27	0.72	0.27	0.03	0.80	0.36

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 6 (5%), Referenced to phase 2:NBT and 6:SBTU, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 18.6 Intersection LOS: B
Intersection Capacity Utilization 75.3% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 303: Columbia Street & Market Street



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	64	3	83	81	3	52
Future Volume (vph)	64	3	83	81	3	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.995		0.933			
Flt Protected	0.954					0.998
Satd. Flow (prot)	1768	0	1738	0	0	1859
Flt Permitted	0.954					0.998
Satd. Flow (perm)	1768	0	1738	0	0	1859
Link Speed (mph)	25		25			25
Link Distance (ft)	398		535			551
Travel Time (s)	10.9		14.6			15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	71	3	92	90	3	58
Shared Lane Traffic (%)						
Lane Group Flow (vph)	74	0	182	0	0	61
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 19.7% ICU Level of Service A
Analysis Period (min) 15

Intersection

Int Delay, s/veh 2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	64	3	83	81	3	52
Future Vol, veh/h	64	3	83	81	3	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	3	92	90	3	58

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	201	137	0	0	182	0
Stage 1	137	-	-	-	-	-
Stage 2	64	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	788	911	-	-	1393	-
Stage 1	890	-	-	-	-	-
Stage 2	959	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	786	911	-	-	1393	-
Mov Cap-2 Maneuver	786	-	-	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	957	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 791	1393	-
HCM Lane V/C Ratio	-	- 0.094	0.002	-
HCM Control Delay (s)	-	- 10	7.6	0
HCM Lane LOS	-	- B	A	A
HCM 95th %tile Q(veh)	-	- 0.3	0	-

UNC DP TIA 2023 — Build (2030) PM
307: Country Club Road & Boundary Street — Lanes, Volumes, Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	648	497	0	0	106
Future Volume (vph)	0	648	497	0	0	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	0	1611
Link Speed (mph)		25	25		30	
Link Distance (ft)		312	90		81	
Travel Time (s)		8.5	2.5		1.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	720	552	0	0	118
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	720	552	0	0	118
Sign Control		Free	Free		Yield	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 39.4% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
313: Ridge Road & Country Club Road — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	104	289	7	26	409	52
Future Volume (vph)	104	289	7	26	409	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.901				0.985	
Flt Protected				0.989	0.958	
Satd. Flow (prot)	1678	0	0	1842	1758	0
Flt Permitted				0.989	0.958	
Satd. Flow (perm)	1678	0	0	1842	1758	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	215			564	517	
Travel Time (s)	4.2			11.0	10.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	116	321	8	29	454	58
Shared Lane Traffic (%)						
Lane Group Flow (vph)	437	0	0	37	512	0
Sign Control	Free			Free	Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 55.7% — ICU Level of Service B
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
313: Ridge Road & Country Club Road — HCM 2010 TWSC

Intersection
Int Delay, s/veh 13

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	104	289	7	26	409	52
Future Vol, veh/h	104	289	7	26	409	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	321	8	29	454	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	437	0	322	277
Stage 1	-	-	-	-	277	-
Stage 2	-	-	-	-	45	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1123	-	672	762
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	977	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1123	-	667	762
Mov Cap-2 Maneuver	-	-	-	-	667	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	970	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	24.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	677	-	-	1123	-
HCM Lane V/C Ratio	0.757	-	-	0.007	-
HCM Control Delay (s)	24.9	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	7	-	-	0	-

UNC DP TIA 2023 — Build (2030) PM
325: Columbia Street & Pittsboro Street — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	591	0	476	221	0
Future Volume (vph)	0	591	0	476	221	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			0%	4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1611	0	1863	1825	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	1863	1825	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	384			956	267	
Travel Time (s)	8.7			26.1	7.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	657	0	529	246	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	657	0	529	246	0
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 54.9% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
329: Pittsboro Street & Manning Drive — Lanes, Volumes, Timings

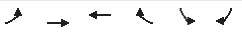


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	318	591
Future Volume (vph)	0	0	0	0	318	591
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt						
Flt Protected					0.950	0.997
Satd. Flow (prot)	0	0	0	0	1681	1764
Flt Permitted					0.950	0.997
Satd. Flow (perm)	0	0	0	0	1681	1764
Link Speed (mph)	25		30			25
Link Distance (ft)	218		384			1147
Travel Time (s)	5.9		8.7			31.3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	353	657
Shared Lane Traffic (%)					10%	
Lane Group Flow (vph)	0	0	0	0	318	692
Sign Control	Free		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 34.3% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
350: Fordham Blvd & Oteys Road — Lanes, Volumes, Timings



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1575	2254	0	0	130
Future Volume (vph)	0	1575	2254	0	0	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	10	10
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3539	0	0	1504
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	0	0	1504
Link Speed (mph)		45	45		25	
Link Distance (ft)		2437	1661		324	
Travel Time (s)		36.9	25.2		8.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1750	2504	0	0	144
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1750	2504	0	0	144
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 77.0% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
350: Fordham Blvd & Oteys Road — HCM 2010 TWSC

Intersection
Int Delay, s/veh 3.2

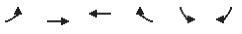
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1575	2254	0	0	130
Future Vol, veh/h	0	1575	2254	0	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1750	2504	0	0	144

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1252
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	164
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	164
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	97.2
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	164
HCM Lane V/C Ratio	-	-	-	0.881
HCM Control Delay (s)	-	-	-	97.2
HCM Lane LOS	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	6.2

UNC DP TIA 2023 — Build (2030) PM
357: Fordham Blvd & NC 54 WB Ramps — Lanes, Volumes, Timings



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1165	1439	0	0	773
Future Volume (vph)	0	1165	1439	0	0	773
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	0	3539	3539	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	0	0	1611
Link Speed (mph)		45	45		25	
Link Distance (ft)		1088	445		1226	
Travel Time (s)		16.5	6.7		33.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1294	1599	0	0	859
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1294	1599	0	0	859
Sign Control		Free	Free		Yield	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 94.3% — ICU Level of Service F
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
358: NC 54 EB Ramps & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	791	415	0	1489	0	0
Future Volume (vph)	791	415	0	1489	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.948					
Flt Protected						
Satd. Flow (prot)	3355	0	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	3355	0	0	3539	0	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	445			1758	975	
Travel Time (s)	6.7			26.6	22.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	879	461	0	1654	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1340	0	0	1654	0	0
Sign Control	Free			Free	Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 80.5% — ICU Level of Service D
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
359: Columbia Street & NC 54 EB Ramps — Lanes, Volumes, Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	664	734	0	2028
Future Volume (vph)	0	0	664	734	0	2028
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt			0.921			
Flt Protected						
Satd. Flow (prot)	0	0	3260	0	0	3539
Flt Permitted						
Satd. Flow (perm)	0	0	3260	0	0	3539
Link Speed (mph)	35		25			25
Link Distance (ft)	424		550			219
Travel Time (s)	8.3		15.0			6.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	738	816	0	2253
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1554	0	0	2253
Sign Control	Free		Free			Free

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 59.4% — ICU Level of Service B
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
360: NC 54 EB Ramps & Ramp Connector — Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	105	0	0	734	0	0
Future Volume (vph)	105	0	0	734	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	1863	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	1863	0	0
Link Speed (mph)	30			35	30	
Link Distance (ft)	270			424	706	
Travel Time (s)	6.1			8.3	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	0	0	816	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	117	0	0	816	0	0
Sign Control	Free			Yield	Free	

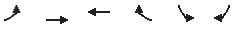
Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 51.1% — ICU Level of Service A
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
361: NC 54 EB Ramps & Fordham Blvd — Lanes, Volumes, Timings

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	791	0	0	1489	0	839
Future Volume (vph)	791	0	0	1489	0	839
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1611
Link Speed (mph)	45			45	30	
Link Distance (ft)	1758			301	706	
Travel Time (s)	26.6			4.6	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	879	0	0	1654	0	932
Shared Lane Traffic (%)						
Lane Group Flow (vph)	879	0	0	1654	0	932
Sign Control	Free			Free	Yield	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 80.5% — ICU Level of Service D
Analysis Period (min) 15

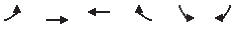
UNC DP TIA 2023 — Build (2030) PM
362: Fordham Blvd & NC 54 WB Ramps — Lanes, Volumes, Timings



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1630	1489	982	0	0
Future Volume (vph)	0	1630	1489	982	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			250	0	0
Storage Lanes	0			1	0	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		
Flt Protected						
Satd. Flow (prot)	0	3539	3539	1583	0	0
Flt Permitted						
Satd. Flow (perm)	0	3539	3539	1583	0	0
Link Speed (mph)		45	45		25	
Link Distance (ft)		301	2437		1188	
Travel Time (s)		4.6	36.9		32.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1811	1654	1091	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1811	1654	1091	0	0
Sign Control		Free	Free		Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 64.1% — ICU Level of Service C
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
1051: US 15/501 NB & NB/EB U-Turn — Lanes, Volumes, Timings



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	393	2305	0	0	0	0
Future Volume (vph)	393	2305	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	3400	3505	0	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3400	3505	0	0	0	0
Link Speed (mph)		30	45		30	
Link Distance (ft)		605	492		205	
Travel Time (s)		13.8	7.5		4.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	437	2561	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	437	2561	0	0	0	0
Sign Control		Free	Free		Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 119.8% — ICU Level of Service H
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
1052: SB/WB U-Turn & US 15/501 SB — Lanes, Volumes, Timings



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	64	2016	0	0
Future Volume (vph)	0	0	64	2016	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	250		0	0
Storage Lanes		0	1		0	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	0.97	0.95	1.00	1.00
Frt						
Flt Protected			0.950			
Satd. Flow (prot)	0	0	3433	3539	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	3433	3539	0	0
Link Speed (mph)	45			45	30	
Link Distance (ft)	1322			777	186	
Travel Time (s)	20.0			11.8	4.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	71	2240	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	71	2240	0	0
Sign Control	Free			Free	Free	

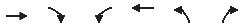
Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 85.2% — ICU Level of Service E
Analysis Period (min) 15

UNC DP TIA 2023 — Build (2030) PM
5001: US 15/501/US 15/501 SB & US 15/501 NB — Lanes, Volumes, Timings



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (vph)	0	1557	0	1192	0	0
Future Volume (vph)	0	1557	0	1192	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	0.95	1.00	1.00
Frt		0.850				
Flt Protected						
Satd. Flow (prot)	0	2787	0	3539	0	0
Flt Permitted						
Satd. Flow (perm)	0	2787	0	3539	0	0
Link Speed (mph)	45			45	45	
Link Distance (ft)	811			1322	1186	
Travel Time (s)	12.3			20.0	18.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1730	0	1324	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1730	0	1324	0	0
Sign Control	Free			Free	Free	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 57.8% — ICU Level of Service B
Analysis Period (min) 15



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1816	0	2305
Future Volume (vph)	0	0	0	1816	0	2305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.88
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	0	2787
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	0	2787
Link Speed (mph)	45			45	45	
Link Distance (ft)	295			829	492	
Travel Time (s)	4.5			12.6	7.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	2018	0	2561
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	2018	0	2561
Sign Control	Free			Free	Free	

Intersection Summary

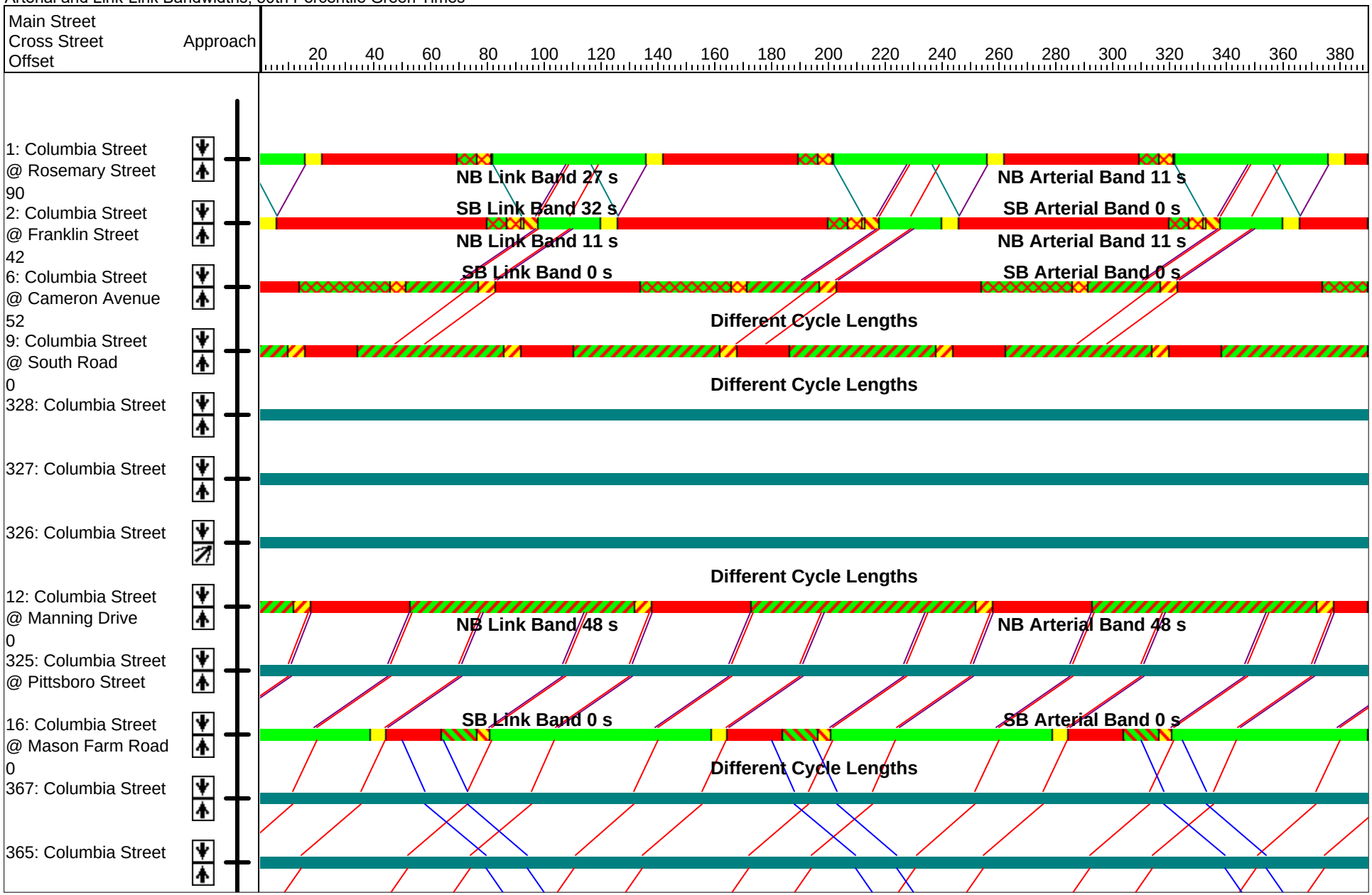
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 84.0% ICU Level of Service E
Analysis Period (min) 15

TIME-SPACE DIAGRAMS

Time-Space Diagram - Columbia Street

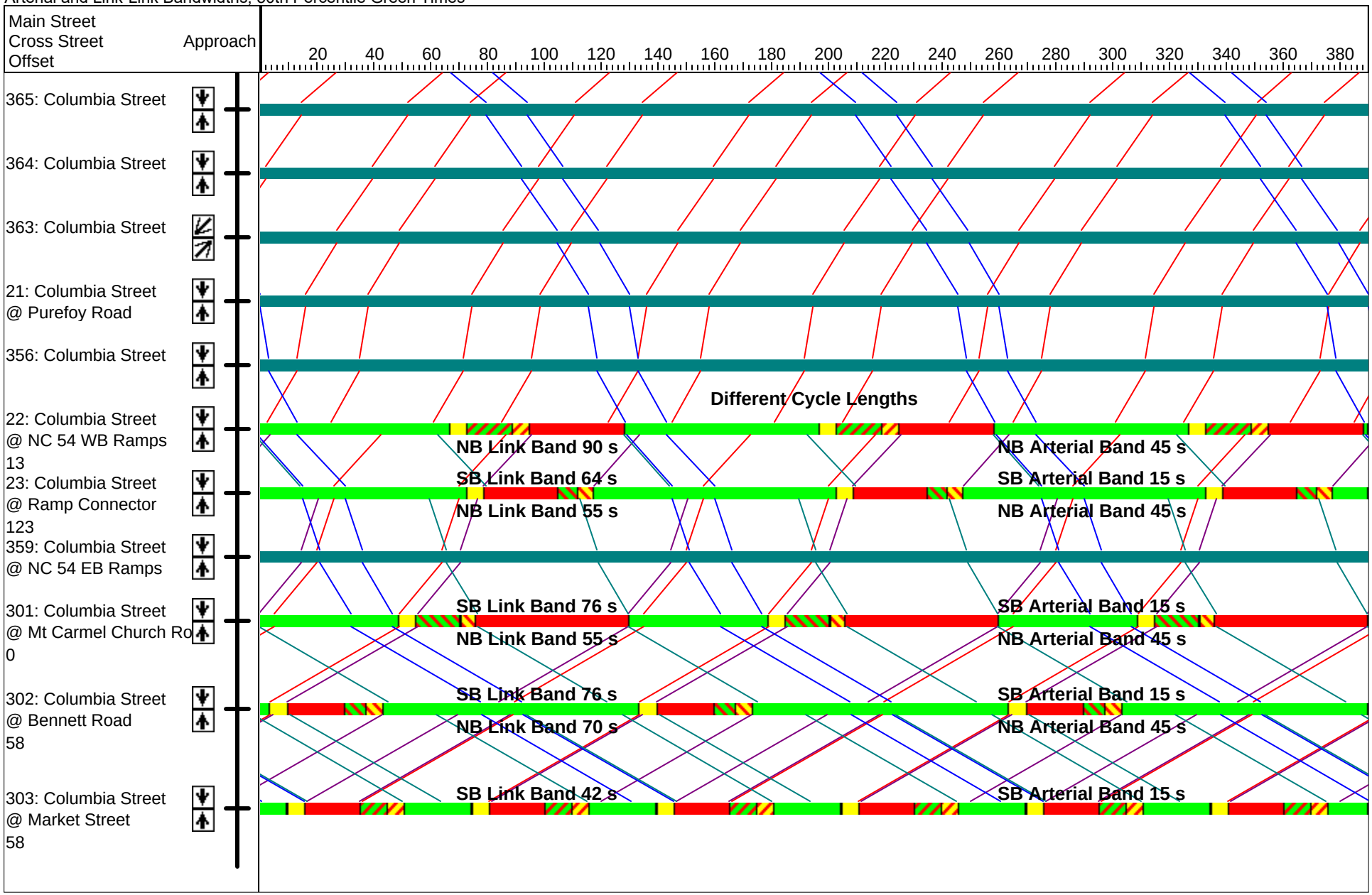
Existing (2023) AM

Arterial and Link-Link Bandwidths, 50th Percentile Green Times



Time-Space Diagram - Columbia Street
Arterial and Link-Link Bandwidths, 50th Percentile Green Times

Existing (2023) AM



Time-Space Diagram - Columbia Street
Arterial and Link-Link Bandwidths, 50th Percentile Green Times

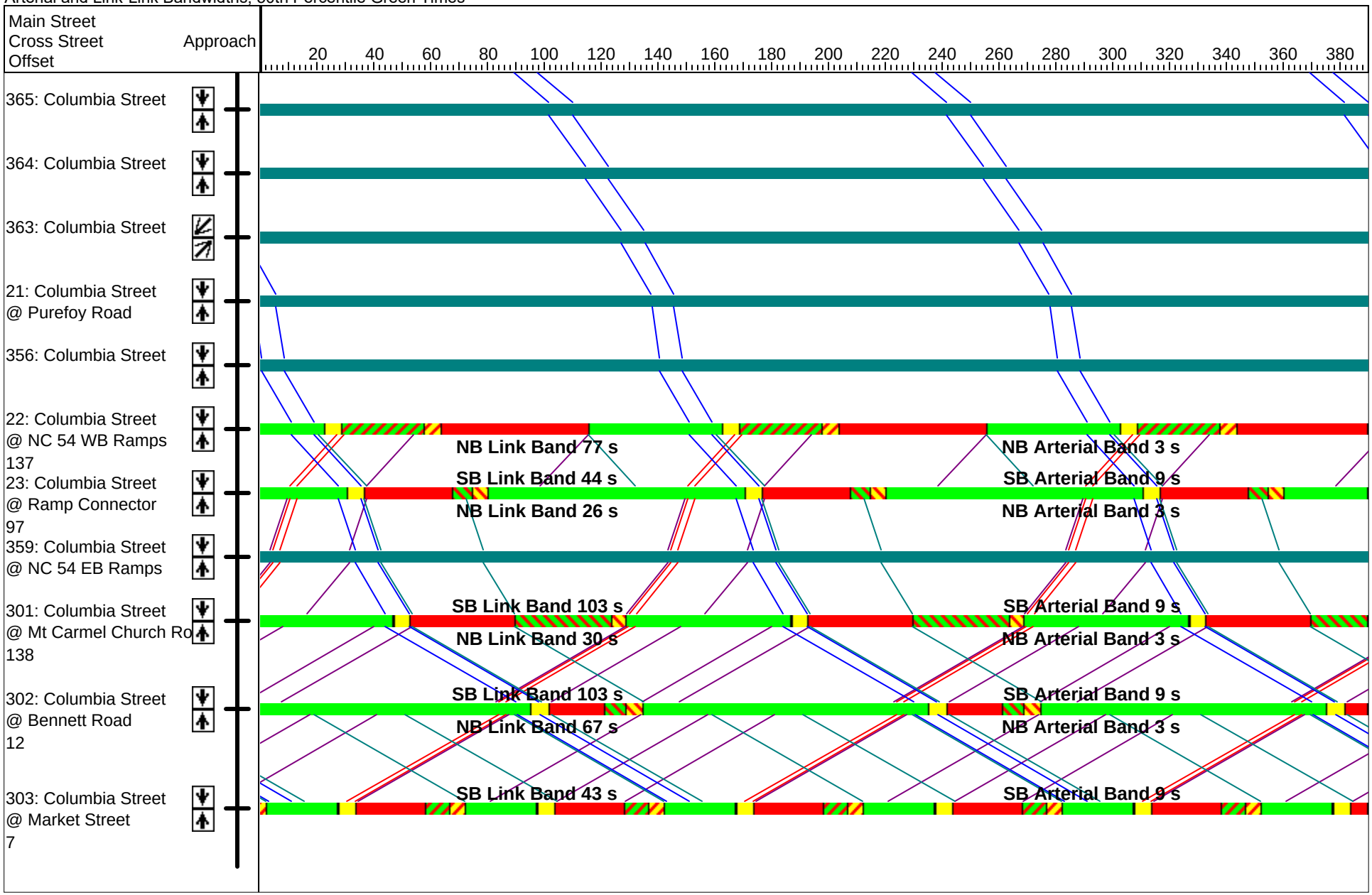
Existing (2023) PM



Time-Space Diagram - Columbia Street

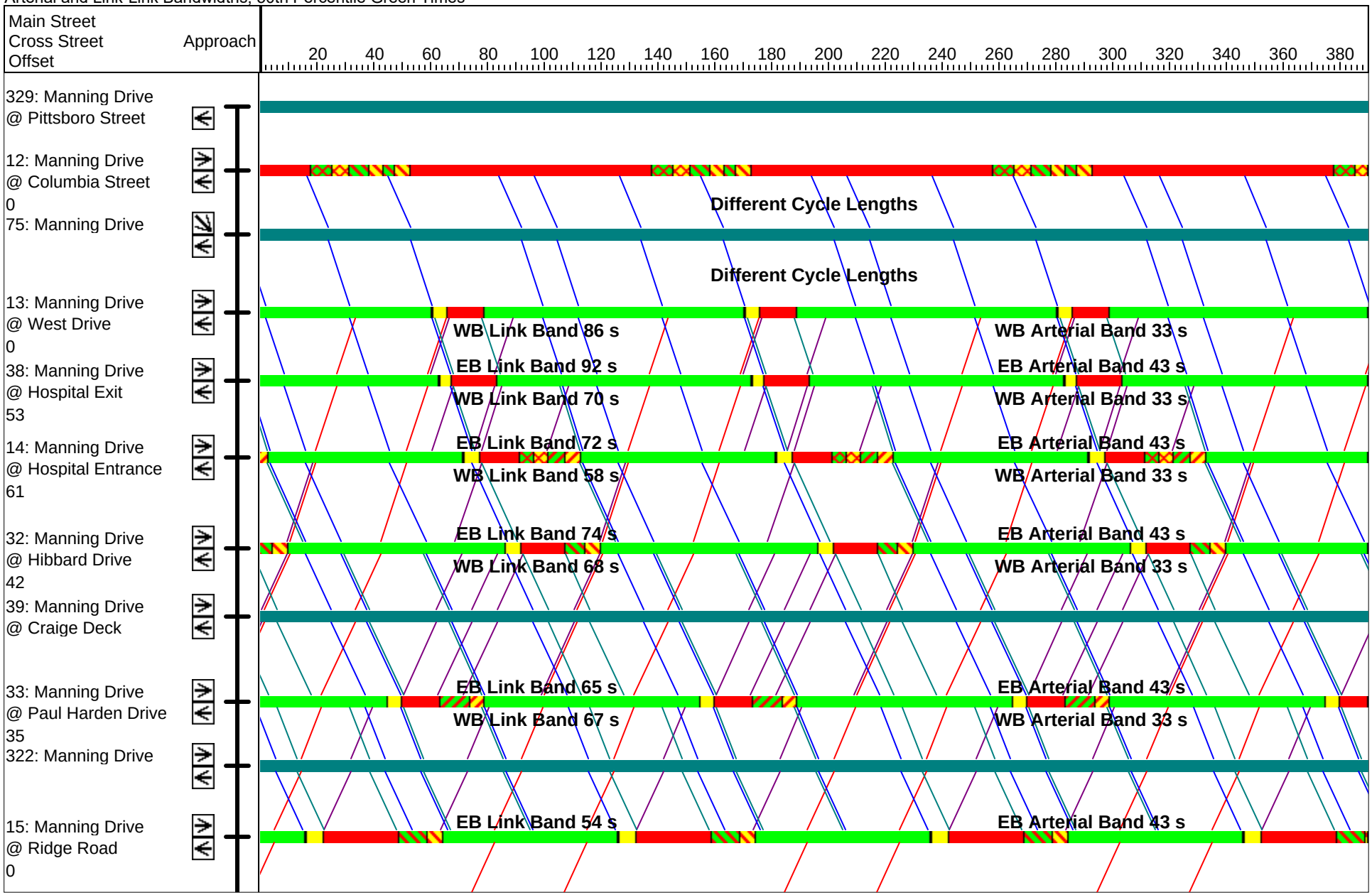
Existing (2023) PM

Arterial and Link-Link Bandwidths, 50th Percentile Green Times



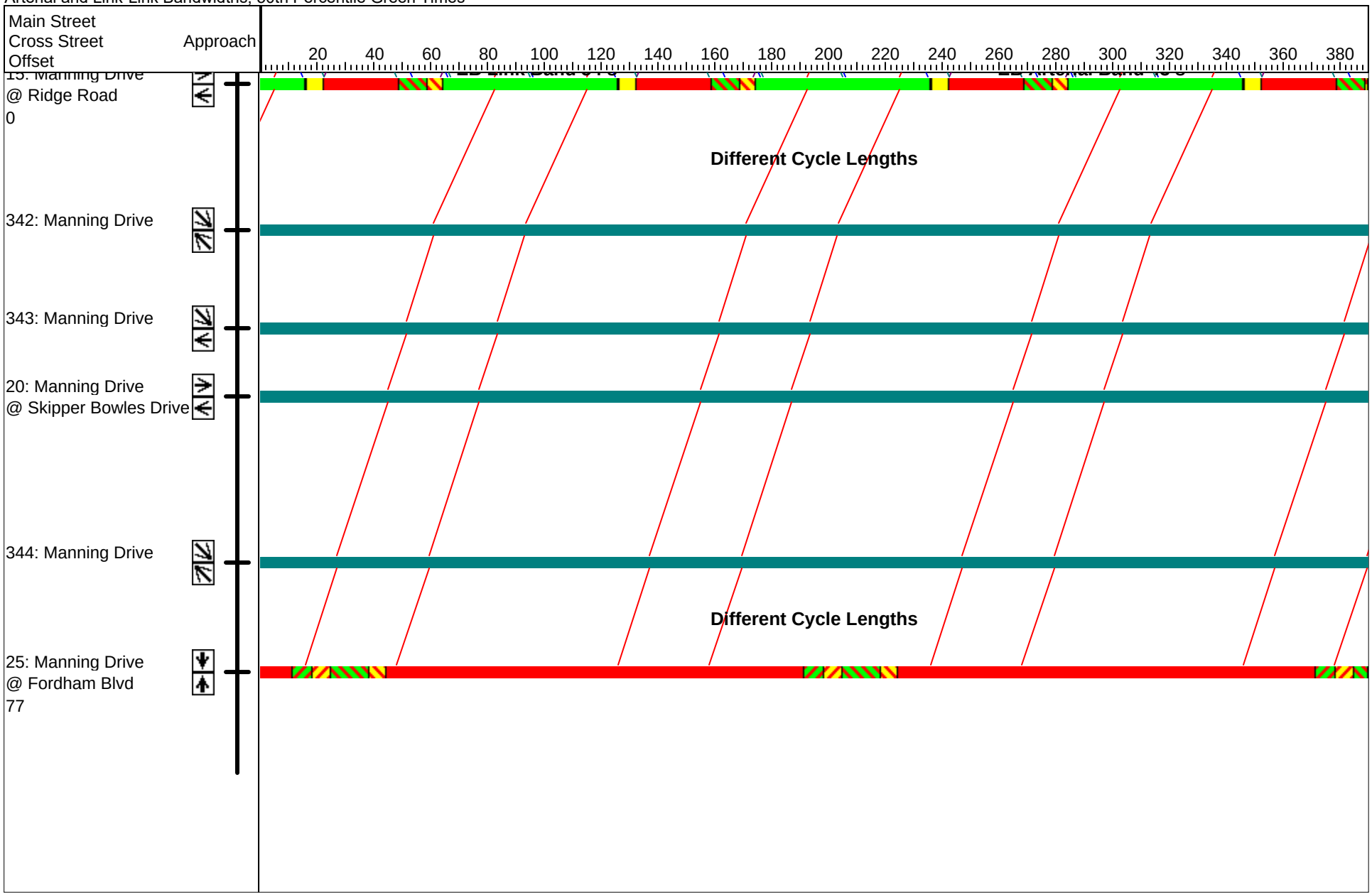
Time-Space Diagram - Manning Drive
Arterial and Link-Link Bandwidths, 50th Percentile Green Times

Existing (2023) AM



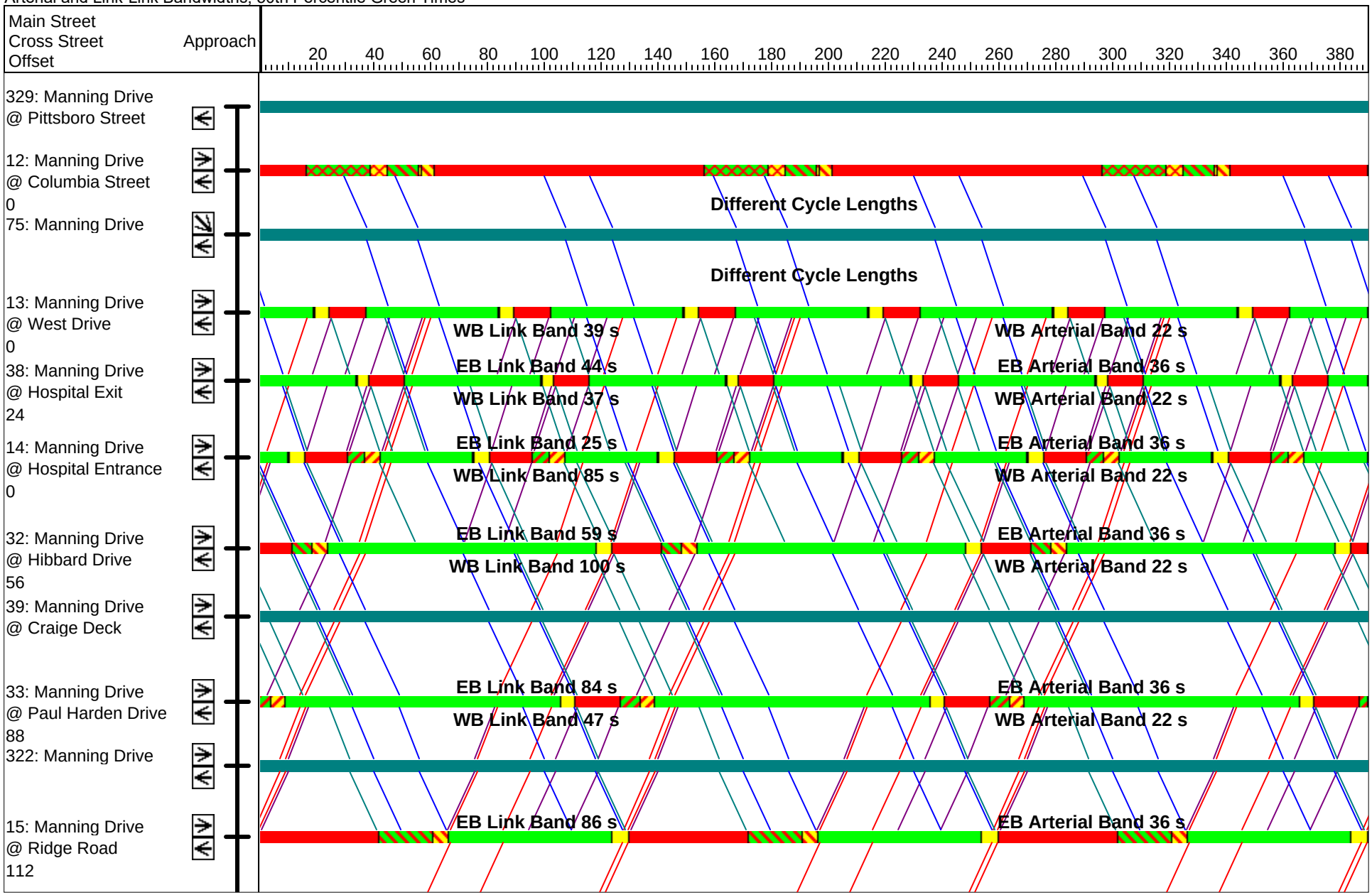
Time-Space Diagram - Manning Drive
Arterial and Link-Link Bandwidths, 50th Percentile Green Times

Existing (2023) AM



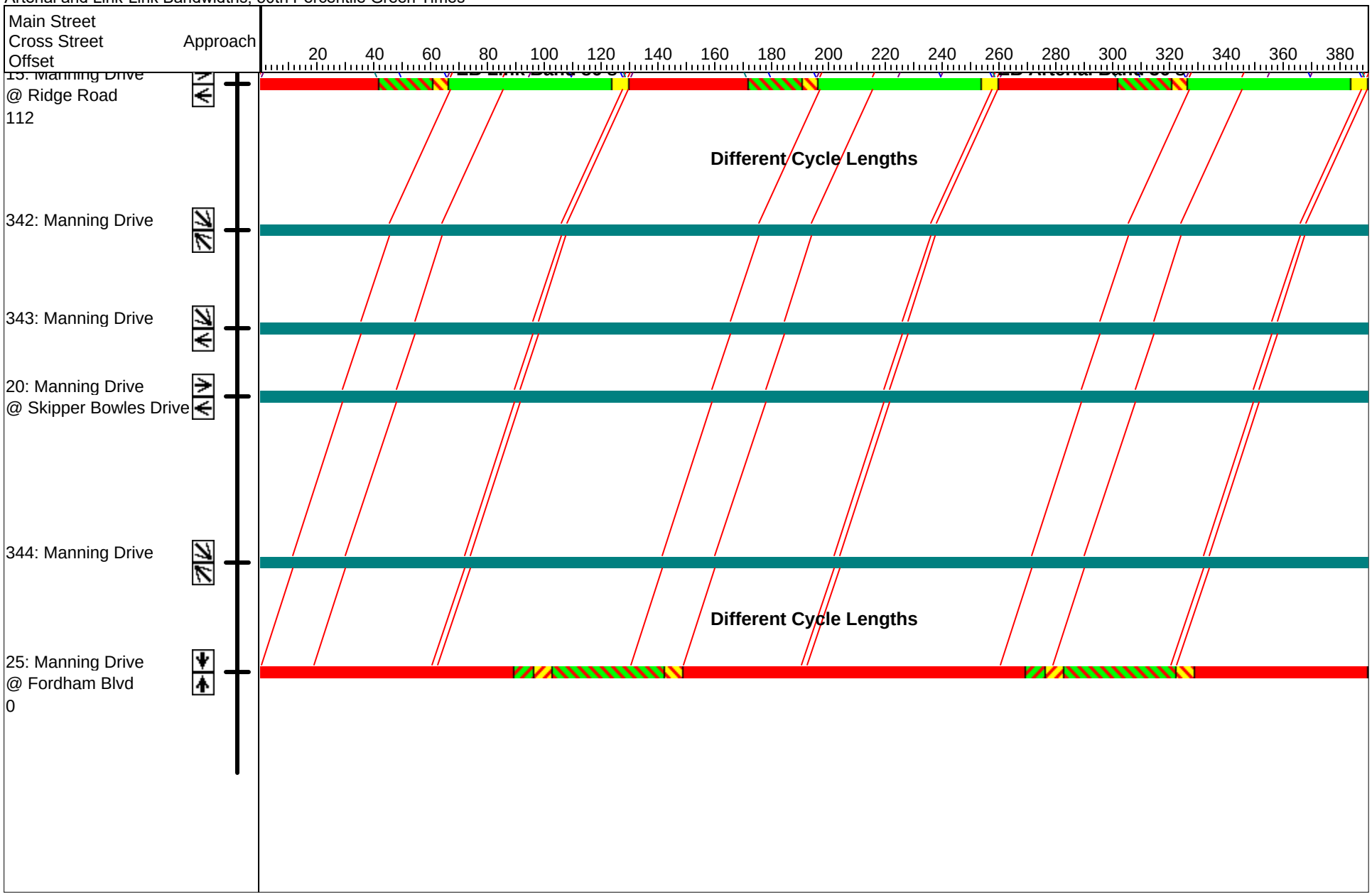
Time-Space Diagram - Manning Drive
Arterial and Link-Link Bandwidths, 50th Percentile Green Times

Existing (2023) PM



Time-Space Diagram - Manning Drive
Arterial and Link-Link Bandwidths, 50th Percentile Green Times

Existing (2023) PM



A RESOLUTION REQUESTING A STAND ALONE ANNUAL DEVELOPMENT PLAN REPORT ON TRANSPORTATION FOR DEVELOPMENT IN THE OFFICE/INSTITUTIONAL-4 ZONING (2005-06-27/R-23)

WHEREAS, the Office/Institutional-4 (OI-4) regulations of the Chapel Hill Land Use Management Ordinance currently require a Transportation Impact Analysis for development in the OI-4 Zoning District; and

WHEREAS, on July 2, 2001, guidelines for the Transportation Impact Analysis were endorsed by the Chapel Hill Town Council including identification of transportation impacts and mitigation measures associated with development, along with an implementation and monitoring plan for identified mitigation measures, as well as identifying the extent of the University's contribution to and responsibility for mitigating transportation impacts; and

WHEREAS, the stated purpose and intent of the OI-4 District was "to allow for growth and development while protecting the larger community, nearby neighborhoods and the environment from impacts accompanying major new development";

NOW, THEREFORE BE IT FURTHER RESOLVED by the Council of the Town of Chapel Hill that the Council hereby request submittal of a stand alone "Annual Development Plan Report on Transportation" beginning in December 2005 and thereafter in December of each year until the end of the current Development Plan cycle. The report shall be prepared in accordance to the guidelines provided in Attachment 1 of June 27, 2005 Manager's Report.

This the 27th day of June, 2005.

GUIDELINES FOR ANNUAL DEVELOPMENT PLAN REPORT ON TRANSPORTATION OFFICE/INSTITUTIONAL-4 (OI-4) ZONING DISTRICT

The University shall provide the Town an annual report titled "Annual Development Plan Report on Transportation". This report shall be in addition to the two-year traffic impact analysis reports required per July 2, 2001 Transportation Impact Analysis (TIA) guidelines. The annual report shall be submitted beginning in December 2005 and thereafter in December of each year until the end of the current Development Plan cycle. It shall be a condensed and standalone document and shall be prepared based on the following guidelines:

1. Development Plan Overview

- A brief overview of the status of the Development Plan projects.
- A map and table showing projects by location in the Development Plan. On the map, the site of each proposed project shall be numbered so that it can be associated with its specifications described in the table. The University shall provide a map equivalent to Figure 2-1 and a summary of Table 2-1 of the January 2004 TIA report of the Development Plan or its successor.
- A brief overview, a map, and a table identifying the parking space impacts of the Development Plan. Map and table shall be equivalent to Figure 2-3 and Table 2-4 of the January 2004 TIA Report of the Development Plan.

2. Development Plan Transportation Changes

- A Brief overview of changes in average daily traffic volumes, a map, and a table of existing and proposed average daily traffic volumes from the most recent TIA. Map and table shall be equivalent to Figure 4-9 and Table 4-9 of January 2004 TIA Report of the Development Plan.
- A brief overview of Level of Service (LOS) information for the existing, no-build, and build conditions at intersections analyzed in the Development Plan with count data from the most recent TIA. LOS information shall be provided in a table equivalent to Table 4-11 of January 2004 TIA Report of the Development Plan.

3. Development Plan Transportation Mitigation Measures and Recommendations

- A brief status overview of mitigation strategies and measures, their impacts to date, and target mode splits from the most recent TIA.
- A brief description of estimated air quality impacts from the most recent TIA.
- A brief status overview and a map of existing and proposed traffic calming measures on campus, including pedestrian and bicycle improvements, from the most recent TIA.
- A brief overview of existing and proposed traffic calming measures in adjacent neighborhoods based on the most recent TIA and any new traffic calming measures as determined by the Town Manager and the University.