

## 05-12-2021 Town Council Meeting Responses to Council Questions

### **ITEM #3: Open the Public Hearing: Application for Conditional Zoning - Aura Development, 1000 Martin Luther King Jr. Blvd.**

**Council Question:**

The applicant is requesting a rezoning to OI-3-CZD. According to the LUMO, “the office/institutional-3 (OI-3) district is intended to provide for major educational, research, public service, and office uses, and their necessary support functions, while minimizing conflicts with adjacent land uses.” This does not seem to fit the Aura very well as it is over 90 percent residential. What other zoning districts were considered and why were they rejected?

**Applicant Response:**

*The LUMO lists Multi Family Dwellings as a permitted use in the OI-3 District. The residential zones in the LUMO are more appropriate for suburban-style residential projects (single family and otherwise). The OI base zoning allows FAR that is more in-line with a project such as this that has been identified by the Town as ideally being transit supportive, yet it does not exempt the project from any of the requirements of residential projects. Ex: The tree canopy requirement for OI-3 is 30% but this project has 40% tree canopy coverage because it is residential project.*

**Council Question:**

Page 83 says that the ESAB recommended denial of the project, but page 109 indicates approval with conditions. Which is correct?

**Council Question:**

The staff presentation portion of the Council materials regarding 1000 MLK Blvd indicate the Environmental Stewardship Advisory Board voted to the deny approval. Yet, p. 109 on the recommendation of ESAB indicated that it recommended approval by a 6-4 vote. Did they vote to recommend approval or denial of the application?

**Council Question:**

Slide 12 has University Place board recommendations rather than Aura's.

**Staff Response:**

*The ESAB voted 6-4 to recommend approval with conditions. We apologize for the mix-up.*

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**Council Question:**

The ESAB recommended more stringent stormwater management controls than are required by the Town's ordinance. What was their rationale and how would that affect project design and cost?

**Applicant Response:**

*ESAB did not provide a rationale for their comment. This project will meet or exceed the town's requirements, and the site will have better-controlled runoff post-development than the existing conditions, including a reduction in stormwater flow to some of the properties to the north. All of Aura's stormwater detention is underground, which allows for maximizing the parks and open space areas, which comprise more than 3.5 acres.*

**Council Question:**

The affordable housing plan on pp. 141-142 specifies 14 for sale affordable housing units on site. The materials elsewhere show sponsorship of five Habitat for Humanity units off site. Which is correct? If the Habitat proposal is the current one, why the change and why only five units, when 15 percent of 57 for sale units would be eight or nine units? Which proposal has the HAB reviewed?

**Applicant Response:**

*The affordable housing unit mix (rentals, for-sale, etc) has changed several times since the concept plan stage. The original Aura proposal had been to provide five townhouse lots for brownstone-style condominiums, which would've yielded ten housing units. Unfortunately, our capital partner now will not allow Aura to include condominiums because of the other complexities of this project (mixed-use, affordable rentals, etc.), so we are proposing the funds for the five townhouse lots be applied to a for-sale affordable unit off-site.*

**Council Question:**

Is the applicant willing to consider a solar PV canopy for the tabletop parking?

**Applicant Response:**

*Because of the steel structures they require, solar panels over parking are 150%-200% the cost of rooftop solar. We have chosen to prioritize future rooftop solar over a greater surface area and EV charging stations (present and future) because of the greater environmental return on investment.*

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**Council Question:**

Will the rental apartment buildings be “stick” construction?

**Applicant Response:**

*The residential buildings will be Type VA construction, which uses frame. The mixed-use/retail and amenities areas will be Type I (Podium/concrete) construction. The subterranean parking will be concrete (either cast-in-place or pre-cast).*

**Council Question:**

A suggestion has been made (not validated) that an east-west road, similar to that called for in the Central West Plan, that would run through the so-called Rummel property and connect with Somerset Dr. would improve traffic flow. Was such an option considered?

**Staff Response:**

*The option was discussed. The applicant has agreed to provide an easement to the adjoining property to the east that could be used in the future for vehicles, bicycles, and pedestrians.*

**Applicant Response:**

*We believe the improvements to Estes/MLK provide a better option for car traffic from Somerset Dr to MLK Blvd because of the negative effect that additional car traffic would have on pedestrians and bicyclists on the greenway and in and around the linear park. A road connecting through the Rummel property would cross the north-south greenway only a short distance from Estes Drive, where a crossing is unavoidable. We have agreed to provide an easement to the town so that it can create a connection to Somerset Dr, should the town decide in the future that the connection is necessary. It is our position that increased cut-through traffic would have a negative effect on the public spaces that are a centerpiece of this development.*

**Council Question:**

The applicant mentions constructing a bus stop on MLK. Will this be a stop for the BRT or a more traditional, smaller bus stop?

**Applicant Response:**

*The details of the bus stop design have not been discussed with Chapel Hill Transit. We expect the bus stop will be of a higher quality than a typical bus shelter.*

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**Council Question:**

Has the applicant explored either underground parking or a podium design for any or all of the buildings to eliminate/reduce the tabletop parking?

**Applicant Response:**

*The tabletop has one acre of underground parking and one level of at-grade parking. Because the tabletop is flat, it will be easier to convert this space to another use in the future. We do have podium construction in the mixed-use building and in the amenity area of the apartments. All of this results in more than 3.5 acres of public parks and open space (about 23% of the area of the site will be parks).*

**Council Question:**

Will we be receiving an applicant presentation in advance of the meeting?

**Applicant Response:**

*The presentation will be provided for council on Wednesday afternoon.*

**Council Question:**

Why is the applicant proposing five units in the Weavers Grove project but no on-site units?

**Applicant Response:**

*The current design calls for large three-story townhouses that are 2100-2400 s.f. and have flexible ground floor space that could serve as an efficiency apartment or home office. This would create the flexible missing middle-type housing that serves a broader variety of housing needs. Our original for-sale affordable-housing proposal carried forward this theme by providing brownstone-style condominiums visually indistinguishable from the market rate townhouses. Unfortunately, our capital partner will not allow the developer to build condominiums in the project, although we could donate land for condos to be developed by others. We are offering to fund affordable housing units offsite so that we can maintain this missing-middle concept while supporting the town's for-sale affordable housing goals.*

*In order to meet affordability guidelines (even at 85% AMI), we would need to redesign the project with smaller townhouses overall so that the affordable units would be visually indistinguishable from the market-rate units. This would eliminate the inherent flexibility provided by the larger townhouses.*

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**Council Question:**

Did the applicant consider proposing less parking spaces? If so, what were lower, contemplated number(s) of parking spaces?

**Applicant Response:**

*We completed a mixed-use shared parking study in order to minimize the number of parking spaces. We believe this rate is lower than any other project of similar scale in Chapel Hill. If you subtract the parking spaces for the townhouses (100 parking spaces off-street) and about 100 retail parking spaces (7.5 spaces per 1000 SF of retail/restaurants), the parking ratio for the 361 apartments is 1.25/unit. This is well below typical parking ratios for apartments.*

**Council Question:**

Regarding the CDC recommendation that the applicant revise the proposed building elevations to have a lighter feel, what does "lighter feel" mean in this context?

**Applicant Response:**

*It was not clear to us what the CDC intended by a "lighter feel," unless it meant to use less brick or a lighter color bricks. CDC will have an opportunity to review building elevations when the project applies for a zoning compliance permit, and we look forward to exploring this comment more fully at that time.*

**Council Question:**

Considering that this proposal involves a development that would be vast majority residential, were any other types of zoning districts considered for rezoning by the applicant?

**Applicant Response:**

*Access to the site is constrained, which limits the amount and type of viable retail for the site. It is a delicate balance and we feel what we have proposed a mix that balances the constraints of the site, traffic and desire for amenities. We believe the 3.5 acres of parks is the "third place" that creates substantial recreational and cultural use that benefits the town and nearby neighborhoods, not just the residents.*

**Council Question:**

What accounts for the differences in the grades for Eastbound and Westbound traffic at the MLK Blvd and Estes Drive between the town-wide model and Aura TIA?

**Staff Response:**

*The models have different assumptions built into them, as well as different methodologies in computing results like vehicle delays and queue lengths. The TIA model is deterministic and built on researched empirical data/equations. The Town-wide model is a micro-simulation*

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*based on stochastic model. Differences in assumptions also include projected traffic volumes, vehicle operating characteristics and potentially, differences in assumed signal timing improvements.*

**Applicant Response:**

*The town-wide model included traffic that could be generated by potential future development projects which that have not yet been submitted. The Aura TIA included only those development projects that are approved or pending. There may also be some variation in signal timing and optimization methodologies that are associated with these two different models*

**Council Question:**

Is it correct that there will be no open dumpsters on the site, but that there will be internal trash rooms?

**Applicant Response:**

*Correct. The apartments will manage trash internally. The majority townhomes will have rollout carts on the rear alley (fire lane) on the northside of the Townhomes (the units backing up to the woodlands will have rollouts to the street).*

**Council Question:**

How many feet of full storage is there now on the westbound right-turn lane at MLK Blvd and Estes Drive intersection?

**Staff Response:**

*There is approximately 400 feet of full-length storage presently for the westbound right-turn lane.*

**Applicant Response:**

*425 feet.*

**Council Question:**

In understanding the applicant's proposed affordable housing plan better, would the sponsorship of five Habitat for Humanity Weavers Grove homes, mean the conversion of five market-rate homes to affordable, or would it mean something else?

**Applicant Response:**

*This detail has not been discussed yet with Habitat.*

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**Council Question:**

What is the applicant's response to the Planning Commission's recommendation to reduce the average parking spaces to 1.2 spaces per unit?

**Applicant Response:**

*See prior comment. Once our community becomes less dependent on cars, the upper level of parking can be converted in the future to a use other than parking.*

**Council Question:**

Why did the Town contract for the "Mini Market Study" of the Aura site? Who conducted it and is there a full report that can be shared?

**Staff Response:**

*Business Street conducted the report and it can be found at this link:*

<https://www.townofchapelhill.org/home/showpublisheddocument?id=48404>

**Council Question:**

How was the number of parking spaces calculated and did it include reductions that assume and encourage higher use of transit than the standard assumptions?

**Applicant Response:**

*See prior answer.*

**Council Question:**

Is there anything in the application that would allow the applicant to convert unfilled commercial to residential?

**Staff Response:**

*The Conditional Zoning Ordinance would limit the number of dwelling units to 418 units and the mix of commercial/retail spaces. The Land Use Management Ordinance Section 4.4.5 (h) determines minor changes to a specific plan. An increase in 10 percent of floor area and 10 percent of parking spaces would be permitted administratively.*

**Applicant Response:**

*We would accept such a requirement. We believe the commercial is right-sized for the project and will be successful on all metrics. The Planning Commission suggested that a range of commercial be allowed, with our proposal being the minimum threshold. For example, Council could require a minimum of 12,500 sf of commercial space and a maximum of X sf, so that additional commercial space would be allowed in the future without a zoning change.*

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### **Council Question:**

The applicant's materials (page 30) include an on-site affordable ownership plan but the presentation refers to Habitat - why did it change?

### **Applicant Response:**

*Our original proposal for for-sale affordable housing had been to provide five townhouse lots for brownstone-style condominiums, and the resulting buildings would have been indistinguishable from the market-rate units. Since our capital partner now will not allow the developer to provide condominiums (although an affordable housing partner could), we would like to provide funding for five Habitat homes in their mixed-income community.*

### **Council Question:**

It's exciting to see that a piece of the Midlyne Trail would be constructed as part of this project. Does the Town have any plans yet for funding the bike lanes on Elliott that this would connect to?

### **Staff Response:**

*There is not currently funding identified for the bike lanes on Elliott Rd., but the project (including a sidewalk on one side) is part of the Town's CIP.*

### **Council Question:**

I may have missed it, but I didn't see any reference to green building standards in the materials - how is the applicant incorporating Council's interests in climate/environmentally-friendly approaches in building construction, use of pervious pavers, etc.?

### **Applicant Response:**

*We are committed to a minimum Bronze Certification by the National Green Building Standards, and we are striving for Silver Certification. The National Green Building Standard (NGBS) is an ANSI-approved green building certification program specifically focused on single-family and multi-family residential buildings, remodeling projects, and land developments. It was developed in partnership ASHRAE, the International Code Council (ICC), and the National Association of Home Builders (NAHB) to provide a uniform national platform for recognizing and advancing green residential construction and development.*



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**Council Question:**

The proposal seems to me, essentially, to be a payment in lieu of units on site. The payment is being directed to another recipient, but it seems to me this could put Habitat in a potentially difficult position in the future given our recent experience with PILs. Is my interpretation accurate?

**Staff Response:**

*Based on the information provided by the applicant, their plan is to provide funding to Habitat to sponsor construction of 5 homes in the Weaver's Grove Development.*

**Council Question:**

Are there competition rules this would violate? It seems we are "sole sourcing" funds to one specific affordable housing nonprofit when there are many that could be equally deserving and use the funds for affordable units elsewhere, as well. There seems to be a fundamental fairness issue here.

**Staff Response:**

*Historically staff has not supported providing funding to an organization to meet the Town's affordable housing requirement. If an applicant proposes to make a payment in lieu of providing affordable housing on-site in our discussions, we continue to recommend directing the payment to the Town's Affordable Housing Fund to be used for eligible projects based on guidance provided by the Council.*

**Council Question:**

Directing a payment for affordable units that have already been approved and will be built will not be adding net new units to the Town's stock. Does this violate the intent of the inclusionary policy?

**Staff Response:**

*The purpose of the Inclusionary Zoning Ordinance is to create new affordable housing in the community. The applicant's proposal is to provide funding to support construction of homes already approved by the Council, therefore facilitating but not creating new housing units. The Ordinance language allows the Council to determine that an applicant's proposal better achieves the goals, objectives and policies of the Comprehensive Plan, that it is not financially feasible to provide units on-site, or that it is impossible to provide units on-site due to federal or State law.*

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**Council Question:**

To get a sense of how the proposed development would feel along Estes, and the relation of the building fronts to the sidewalks and planting areas, can we get site sections at the places where the face of the building (not courtyards) is closest to and farthest away from the street/multiuse path? Can we also see a comparison of the setback of Aura with Azalea Estates down the street?

**Staff Response:**

*We are working with the applicant to provide the requested information.*

**Council Question:**

What is Aura's per acre density? How does that compare with density in a representative Blue Hill multifamily complex, for example?

**Staff Response:**

*The property is approximately 16.1 acres and a total of 418 dwelling units are proposed for a density of approximately 26 units/acre. The table below includes estimates of several of the Blue Hill multifamily complexes:*

<i>Development</i>	<i>Units/Acre</i>	<i># of Units</i>	<i>Parcel Size</i>
<i>Fordham Blvd Apartments</i>	<i>35.4 units per acre</i>	<i>272</i>	<i>7.69 acres</i>
<i>Berkshire Apartments</i>	<i>58.5 units per acre</i>	<i>265</i>	<i>4.53 acres</i>
<i>Trilogy</i>	<i>45.4 units per acre</i>	<i>328</i>	<i>7.22 acres</i>

**Council Question:**

Will we have the detailed traffic modeling data (numerical results from all runs of the simulation, not just the average) for Wednesday's meeting, as requested last Monday?

**Staff Response:**

*Please see the attached Estes Drive Scenario Test Technical Memorandum dated May 10, 2021.*

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#### **Council Question:**

Can we hear from stormwater staff addressing neighbor concerns that the stormwater system as designed will not be able to meet the town standards for controlling runoff?

#### **Staff Response:**

*The following are required stormwater management performance criteria:*

- (a) Stormwater treatment shall be designed to achieve average annual eighty-five (85) percent total suspended solids (TSS) removal and must apply to the volume of post-development runoff resulting from the first one-inch of precipitation. Alternative treatment methods to achieve eighty-five (85) percent average annual TSS removal may be acceptable. The eighty-five (85) percent requirement applies to eighty-five (85) percent of the additional suspended solids that are the result of the new development. (Ord. No. 2004-02-23/O-2)*
- (b) The stormwater runoff volume leaving the site post-development shall not exceed the stormwater runoff volume leaving the site pre-development (existing conditions) for the local 2-year frequency, 24-hour duration storm event for all development except single-family and two-family dwellings on lots existing as of January 27, 2003, or on lots pursuant to a preliminary plat that was approved by the town council prior to January 27, 2003. This may be achieved by hydrologic abstraction, recycling and/or reuse, or any other accepted scientific method.*
- (c) The stormwater runoff rate leaving the site post-development shall not exceed the stormwater runoff rate leaving the site pre-development (existing conditions) for the local 1-year, 2-year, and 25-year 24-hour storm events.*
- (d) Land disturbance within the stream channel of any ephemeral stream shall be minimized, and prohibited unless explicitly authorized by issuance of a zoning compliance permit after demonstration of the necessity for the disturbance.*

*The site is meeting requirements a, c, and d as written. Due to poor infiltration on the site, the applicant is requesting an alternative solution to requirement b. Instead of using "hydrologic abstraction, recycling and/or reuse" to keep the increased runoff volume from the 2-year storm on-site, the applicant is requesting to slowly release the volume over 2-5 days. This allowance is frequently given to applicants due to low infiltration rates of soils in the area and the State's design requirement for stormwater control measures to release the design volume between 2 and 5 days. The 2-5 day limit was created to mitigate risk of subsequent major storm events causing overtopping or failure of the stormwater control measure.*

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**Council Question:**

Given that the area has existing flooding problems, have any numbers been run to see if small changes in the stormwater system would let the system handle 50- or 100-year storms?

**Staff Response:**

*The Town's requirements for stormwater design are with respect to 1-year, 2-year, and 25-year 24-hour storm events which the applicant has met. No numbers have been run for the 50- or 100-year storm events.*

**Council Question:**

What is the start date for multimodal path construction? What will be the traffic impacts and how long will those traffic impacts be during the path construction?

**Staff Response:**

*There is not a start date for the project yet, but it will likely be in June or July of this year. There will be extensive traffic impacts, including a long-term one-way pattern on Estes Drive. We will have a clearer schedule and proposed dates for the various traffic control phases after a construction firm is selected and the pre-construction meeting is held.*

**Council Question:**

How was OI3 considered for this project when it is 98% residential?

**Staff Response:**

*The LUMO lists Multi Family Dwellings as a permitted use in the OI-3 District. The residential zones in the LUMO are more appropriate for suburban-style residential projects (single family and otherwise). The OI base zoning allows Floor Area Ratio (FAR) that is more in-line with a project such as this that has been identified by the Town as ideally being transit supportive, yet it does not exempt the project from any of the requirements of residential projects. Ex: The tree canopy requirement for OI-3 is 30% but this project has 40% tree canopy coverage because it is residential project.*

**Council Question:**

Can the applicant provide 3D modeling/rendering so we can get a better sense of massing and overall feel?

**Staff Response:**

*We are working with the applicant to provide the requested information.*

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### **Council Question:**

How much room is needed on the Estes (and MLK too, I guess) frontage in terms of setbacks so that large street trees can be planted and survive?

### **Staff Response:**

*The only town directive for soil minimums is found in the Town's Design Guidelines. In that section of the parking standards, the minimum amount of surface soil (in square feet) that a tree should be planted in is mentioned. Two hundred (200) square feet is required w/ minimum dimensions being 20 feet x 10 feet. However, this standard leaves out a more important concept: soil volume (length, width, and depth). In other words, square footage does not yield the depth of amended soil that a tree should have access to in order not just to survive, but thrive. Landscape industry standards generally suggest approx. 1,000 cubic feet of soil for large trees. These types of directives are generally applied to street trees or trees in planters on structural slabs where soil volume is not at a premium. Given this standard, minimum square footage dimensions are not as important as volume. If overall volume is provided for (for example an amended soil panel) then even street trees planted in a 3 foot wide landscape verge (or island) can survive and thrive.*

*These standards would decrease based on the sizes of the tree. Another factor to consider is the type of soil being provided. 1,000 square feet of compacted sub-grade would not be as desirable as 800 square feet of amended soil which would include organic matter to assist in aeration, water movement, and growth.*

### **Council Question:**

The neighbors are very concerned about blasting during construction (as happened at Azalea estates); what is being planned, will it have an impact on nearby homes, and what ended up happening at Azalea in terms of impacts and mitigation?

### **Staff Response:**

*We are working with the applicant to understand any necessary blasting. We expect additional information to be available at the public hearing.*

### **Council Question:**

Can we get more accurate school traffic counts from Phillips and Estes Hills pre-pandemic?

### **Staff Response:**

*No pre-pandemic school traffic counts were collected. Pre-pandemic traffic counts were collected at Estes Dr/Caswell signalized intersection; at Estes Dr/Somerset Dr; and at Estes Dr/Martin Luther King Jr Blvd.*

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**Council Question:**

What is the regulating plan to get Somerset aligned with the future development across the street?

**Staff Response:**

*Most future development would be required to go through an entitlement phase. During the review phase, staff would work with any prospective developers regarding access and connectivity.*

**Council Question:**

Has impervious gone up? If so, why?

**Staff Response:**

*The proposed impervious surface area has remained constant since the initial submittal in September 2020. The applicant is proposing 466,092 square feet of impervious surface or 66.1 percent of the property.*

**TECHNICAL  
MEMORANDUM – DRAFT**



**To**  
Kumar Neppalli  
Traffic Engineering Manager  
Town of Chapel Hill

**From**  
Craig Scheffler, P.E., PTOE  
HNTB North Carolina, P.C.

**Cc**  
HNTB Project File: 75645

**Subject**  
Town of Chapel Hill Town-Wide  
Transportation Model – Estes Drive  
Scenario Testing

**Date**  
05/10/21

HNTB North Carolina, PC (HNTB), under contract with the Town of Chapel Hill, has developed a Town-wide Transportation Model using the Caliper Corporation TransModeler software tool. This document is intended to provide information on scenario tests developed using the Town-wide Model that focus on the Estes Drive area and proposed Aura Development.

**Introduction**

In the development review process for the proposed Aura Development, located in the northeast quadrant of NC 86 (Martin Luther King, Jr. Blvd) and Estes Drive, the Chapel Hill Town Council directed Town staff to provide additional future scenario testing using the Town-wide Transportation Model to include a broader range of background potential future developments. Town staff coordinated with HNTB to develop a list of potential developments to be added to the Town-wide Model for a test of operational performance in the 2024 analysis year previously assumed for the Aura Development Transportation Impact Analysis.

**Scenario Testing Methodology and Assumptions**

The 2021 Base Year Town-wide model was used for the scenario testing exercise with currently (as of May 2021) coded attributes (roadway geometrics, traffic control and Base Year signal timings) to create 2024 AM and PM peak hour scenarios, with the following changes:

- Committed and/or recommended roadway and signal timing improvements applied to the Estes Drive intersections with NC 86 (Martin Luther King, Jr. Blvd) and E. Franklin Street.
- Proposed or assumed Access Laneage and Traffic Control for Background Developments in the Estes Drive/NC 86 (Martin Luther King, Jr. Blvd) vicinity.
- Utilization of the TransModeler TIA Toolbox feature to input all known and projected land uses and their intensities (as provided in previous TIA reports or information from Town) to generate AM and PM peak hour trips from each background development. Trips were distributed and assigned, using TIA Toolbox/TransModeler methodologies, and based on existing peak hour traffic patterns and O-D matrix.

Each scenario model was run for the typical weekday AM and PM peak hours, with 15 minute model seeding periods, and an assumed equal distribution of traffic flow over the peak hour. All other assumptions regarding vehicle characteristics and driver behaviors coded into the 2021 Base Year model were left unchanged. Model Measures-of-Effectiveness (MOE) results were extracted for intersection performance for the following intersections along Estes Drive:

- NC 86 (Martin Luther King, Jr. Blvd) and Estes Drive
- Somerset Drive and Estes Drive
- E. Franklin Street and Estes Drive
- Future potential local roadway connections and Estes Drive/NC 86 in the Central West Planning Area
- Future planned Aura Development driveways and Estes Drive/NC 86

The MOE results contain vehicular delay, Level-of-Service (LOS) and queue length information, including averages and maximum/ minimum data extracted from randomized number seed stochastic variation results from five model runs for each scenario. Scenario tests of a potential traffic signal and roundabout were also completed at the current Estes Drive and Somerset Drive intersection (future potential four-legged intersection). The following scenarios were tested for AM and PM peak hour conditions:

- 2021 Base Year
- 2024 Without Aura (Includes all other background developments and committed transportation network improvements)
- 2024 With Aura
- 2024 With Aura (Includes all recommended improvements from Aura TIA)

Future potential background development information was compiled from previous TIA studies and/or information from Town of Chapel Hill staff for the Central West planning area. Trip generation information for each development or redevelopment parcel was added to all 2024 scenarios and is shown in **Table 1**. The Town-wide model TIA Toolbox methodology was used to generate trips for each development and trips were distributed through the entire Town-wide model based on Base Year model trip matrix methodologies. It was conservatively assumed that all potential developments would be fully built-out and operational for the 2024 analysis year.



**Table 1. 2024 Scenario Test Background Development Information**

Background Developments List for 2024 Aura/Estes Drive Scenario Testing										
ID	Development Name	Area	Land Use	ITE LUC Density Change	AM Peak Trips			PM Peak Trips		
					IN	OUT	TOTAL	IN	OUT	TOTAL
1	Fordham Apartments	Blue Hill	Multi-Family Residential	273 Units - 50 Hotel units	11	89	100	85	40	125
2	Hillstone	Blue Hill	Multi-Family Residential	220 Units	29	115	144	112	60	172
3	Quality Inn	Blue Hill	Multi-Family Residential	236 Units + 125 Hotel Units	55	110	165	89	56	145
4	Park at Chapel Hill	Blue Hill	Multi-Family Residential	+500 Net Units	49	197	246	94	44	138
5	University Place - Phase 1	Mall Area	Commercial	Mixed Uses	367	291	658	704	632	1,336
6	Town Municipal Services Campus	NC 86	Institutional - Office	48k Office + 24k Police Station Net	126	16	142	38	150	188
7	E. Rosemary Parking Deck & Office	Downtown	Public Parking/General Office	Net Parking Incr + 200K Office	327	40	367	82	305	387
8	W. Rosemary St Hotel	Downtown	Hotel	125 Unit Hotel - 90 Existing Parking	17	26	43	36	19	55
9	Union Chapel Hill Apartments	Downtown	Multi-Family Residential	350 Condos - 111 Apartments	24	97	121	148	80	228
A	Aura	Central West	Mixed-Use	Mixed Uses	81	129	210	120	86	206
B	Rummel Property	Central West	Multi-Family Residential	175 units	14	42	57	45	66	111
C	Azalea	Central West	Senior Assisted Living	100 Units	18	9	27	23	28	51
D	Amity UMC	Central West	Institutional - Church	N/A	0	0	0	0	0	0
E		Central West	Multi-Family Residential	36 units	4	9	13	9	14	23
F	YMCA Expansion	Central West	Recreational	30K SF	35	18	53	46	52	98
G	Saw Mill	Central West	Multi-Family Residential	112 units	10	27	37	30	42	72
H	Richardson Property	Central West	Multi-Family Residential	117 units	10	29	39	31	45	76
I	Office Park	Central West	General Office	N/A	0	0	0	0	0	0
J	Peace Property	Central West	Multi-Family Residential	65 units	5	16	22	17	25	42
					1,182	1,260	2,443	1,708	1,745	3,453
	-2024 Build Scenario Only									

**Model Results and Comment**

Town-wide model results were collected for the intersections along Estes Drive as described above. Model results for intersection delay (overall average and average by approach), the corresponding equivalent Level-of-Service (LOS) and Maximum queue recorded for the adjacent roadway links were extracted at the completion of each AM and PM peak hour scenario model run batch. Additional information for the maximum and minimum delay and maximum queue data over the five model runs were requested and included in tabular data. **Table 2** shows the 2021 Base Model results. The intersection of E. Franklin Street and Estes Drive is at/over capacity (LOS E) in the current PM Peak hour. Estes Drive at NC 86 experiences some excessive queuing that spills back beyond existing left and right-turning bays in both peak hours.

Table 2. 2021 Base Model Scenario Traffic Operations Results

2021 Base Model		AM Peak Hour						
Intersection and Approach	Traffic Control	LOS	Average Delay (Sec/Veh)	Maximum Delay (Sec/Veh)	Minimum Delay (Sec/Veh)	Average Max Queue (ft)	Maximum Queue (ft)	Minimum Queue (ft)
<b>NC 86 (MLK Blvd) and Estes Drive</b>	Signal	<b>D</b>	<b>47.3</b>	<b>52.1</b>	<b>43.4</b>			
Eastbound		E	76.3	92.1	56.7	900	1075	650
Westbound		D	46.8	50.9	42.2	350	375	275
Northbound		C	33.5	36.3	30.9	400	525	350
Southbound		C	34.6	38.1	33.0	450	600	400
<b>Estes Drive and Somerset Drive</b>	Two-Way Stop	-	-	-	-	-	-	-
Southbound		A	5.4	7.9	2.5	25	25	25
<b>Estes Drive and E. Franklin Street</b>	Signal	<b>C</b>	<b>28.7</b>	<b>29.8</b>	<b>26.7</b>			
Eastbound		C	33.5	35.9	28.6	425	500	350
Westbound		C	33.0	34.7	29.9	225	250	150
Northbound		C	24.0	26.1	20.7	200	225	125
Southbound		C	25.3	27.5	22.3	375	425	300

2021 Base Model		PM Peak Hour						
Intersection and Approach	Traffic Control	LOS	Average Delay (Sec/Veh)	Maximum Delay (Sec/Veh)	Minimum Delay (Sec/Veh)	Average Max Queue (ft)	Maximum Queue (ft)	Minimum Queue (ft)
<b>NC 86 (MLK Blvd) and Estes Drive</b>	Signal	<b>E</b>	<b>58.5</b>	<b>62.6</b>	<b>56.0</b>			
Eastbound		E	70.1	83.6	63.3	650	725	450
Westbound		E	63.0	78.1	50.8	850	1500	375
Northbound		E	59.6	61.8	55.9	625	675	550
Southbound		D	45.6	48.9	42.7	475	600	450
<b>Estes Drive and Somerset Drive</b>	Two-Way Stop	-	-	-	-	-	-	-
Southbound		C	16.0	20.6	12.5	125	100	150
<b>Estes Drive and E. Franklin Street</b>	Signal	<b>D</b>	<b>47.9</b>	<b>50.5</b>	<b>46.1</b>			
Eastbound		E	58.0	68.1	51.7	625	700	500
Westbound		D	54.8	56.4	51.0	525	550	450
Northbound		D	41.8	42.5	40.5	475	500	425
Southbound		D	43.2	47.0	38.7	500	550	475

Max Queue Lengths Calculated to Nearest Upstream Intersection/Node in Model – Queue May Exceed Distance Reported  
**RED** – Overall Intersection (Signalized) or Critical Movement (Unsignalized) Exceeds Town Operational Performance LOS Threshold

The 2024 No-Build scenario model operational results are shown in Table 3. With the addition of the substantial number of background potential developments, increases in vehicular delay and degradation of LOS occurs at several study area intersections. Improvements to the NC 86 intersection with Estes Drive mitigate operational issues at this location. A new local roadway connecting to Somerset Drive at Estes

Drive, along with increased traffic volumes by 2024 at this location cause operational problems in the AM and PM peak hours.

**Table 3. 2024 No-Build Aura Scenario - Traffic Operations Results**

2024 No-Build Model		AM Peak Hour						
Intersection and Approach	Traffic Control	LOS	Average Delay (Sec/Veh)	Maximum Delay (Sec/Veh)	Minimum Delay (Sec/Veh)	Average Max Queue (ft)	Maximum Queue (ft)	Minimum Queue (ft)
<b>NC 86 (MLK Blvd) and Estes Drive</b>	Signal	<b>D</b>	<b>40.9</b>	<b>41.5</b>	<b>36.5</b>			
Eastbound		E	76.3	79.7	53.3	1000	1100	700
<b>Westbound</b>		D	37.3	41.8	36.3	225	250	150
Northbound		C	30.4	31.4	25.5	300	375	250
Southbound		C	38.2	41.1	33.7	375	700	325
<b>Estes Drive and Somerset Drive</b>	Two-Way Stop	-	-	-	-	-	-	-
<b>Northbound</b>		C	18.2	19.4	15.6	50	50	25
Southbound		C	21.4	23.1	16.4	50	50	25
<b>Estes Drive and E. Franklin Street</b>	Signal	<b>D</b>	<b>43.4</b>	<b>43.6</b>	<b>41.8</b>			
Eastbound		D	50.5	58.0	45.0	650	700	550
Westbound		E	56.4	64.3	48.2	450	500	300
Northbound		C	31.2	33.3	29.4	225	250	200
Southbound		D	36.4	38.9	32.6	525	575	425
<b>NC 86 (MLK Blvd) and Local Road Connection (RIRO)</b>	Two-Way Stop	-	-	-	-	-	-	-
<b>Westbound</b>		A	5.6	6.0	4.7	50	75	25

2024 No-Build Model		PM Peak Hour						
Intersection and Approach	Traffic Control	LOS	Average Delay (Sec/Veh)	Maximum Delay (Sec/Veh)	Minimum Delay (Sec/Veh)	Average Max Queue (ft)	Maximum Queue (ft)	Minimum Queue (ft)
<b>NC 86 (MLK Blvd) and Estes Drive</b>	Signal	<b>E</b>	<b>55.1</b>	<b>64.1</b>	<b>49.2</b>			
Eastbound		D	54.3	63.2	50.1	550	675	325
<b>Westbound</b>		D	43.0	50.2	38.1	725	800	475
Northbound		E	65.7	79.2	57.5	675	700	650
Southbound		D	53.8	68.6	46.6	375	400	325
<b>Estes Drive and Somerset Drive</b>	Two-Way Stop	-	-	-	-	-	-	-
<b>Northbound</b>		<b>F</b>	<b>122.8</b>	<b>130.9</b>	42.1	275	325	100
Southbound		<b>F</b>	<b>155.7</b>	<b>166.4</b>	<b>70.3</b>	250	275	225
<b>Estes Drive and E. Franklin Street</b>	Signal	<b>F</b>	<b>119.3</b>	<b>138.4</b>	<b>98.4</b>			
Eastbound		F	91.4	118.1	77.6	750	1000	625
Westbound		F	160.6	172.2	92.7	1275	1500	875
Northbound		F	166.8	305.5	89.8	1600	2600	950
Southbound		E	69.5	67.7	57.5	700	875	575
<b>NC 86 (MLK Blvd) and Local Road Connection (RIRO)</b>	Two-Way Stop	-	-	-	-	-	-	-
<b>Westbound</b>		C	18.0	30.1	8.6	50	100	25

Max Queue Lengths Calculated to Nearest Upstream Intersection/Node in Model – Queue May Exceed Distance Reported  
**RED** – Overall Intersection (Signalized) or Critical Movement (Unsignalized) Exceeds Town Operational Performance LOS Threshold  
**GREEN** – New or Improved Intersection Approaches from Previous Scenario

The 2024 Build Scenario results are shown in **Table 4**. The Build Scenario includes the construction of the Aura Development with two proposed single lane driveways and no other improvements beyond what is reflected in the 2024 No-Build Scenario. In general, operations results show overall marginal increases in delay and queuing compared to the 2024 No-Build Scenario. The Aura Driveway connection with Estes Drive has a maximum (worst-case) model run delay exceeding the LOS E threshold for unsignalized intersections.

**Table 4. 2024 Build Aura Scenario - Traffic Operations Results**

2024 Build-Aura Model	Traffic Control	AM Peak Hour						
		LOS	Average Delay (Sec/Veh)	Maximum Delay (Sec/Veh)	Minimum Delay (Sec/Veh)	Average Max Queue (ft)	Maximum Queue (ft)	Minimum Queue (ft)
<b>NC 86 (MLK Blvd) and Estes Drive</b>	Signal	D	39.5	40.5	35.0			
Eastbound		E	67.8	79.4	51.7	850	1000	650
Westbound		D	39.1	41.8	37.1	250	325	200
Northbound		C	30.3	32.3	28.5	325	400	275
Southbound		C	29.0	30.3	25.9	375	850	250
<b>Estes Drive and Somerset Drive</b>	Two-Way Stop	-	-	-	-	-	-	-
Northbound		B	13.6	22.6	7.6	50	75	25
Southbound		B	14.9	21.9	10.0	100	100	50
<b>Estes Drive and E. Franklin Street</b>	Signal	D	43.4	43.6	41.8			
Eastbound		D	51.6	59.3	42.0	675	1400	575
Westbound		E	56.8	62.5	52.2	450	500	375
Northbound		C	31.7	36.8	29.2	225	275	175
Southbound		D	35.4	39.3	32.2	525	600	400
<b>MLK Blvd and Future Aura Access #1</b>	Two-Way Stop	-	-	-	-	-	-	-
<i>Westbound</i>		A	6.1	6.5	5.2	25	25	25
<b>Estes Dr and Future Aura Access #2</b>	Two-Way Stop	-	-	-	-	-	-	-
<i>Southbound</i>		C	15.3	18.8	13.0	50	100	25
<b>NC 86 (MLK Blvd) and Local Rd Access (RIRO)</b>	Two-Way Stop	-	-	-	-	-	-	-
Westbound		A	6.8	10.8	4.3	25	25	25

Max Queue Lengths Calculated to Nearest Upstream Intersection/Node in Model – Queue May Exceed Distance Reported  
*BLUE* – Proposed Aura Intersections/Approaches

**Table 4 (Continued). 2024 Build Aura Scenario - Traffic Operations Results**

2024 Build-Aura Model	Traffic Control	PM Peak Hour						
		LOS	Average Delay (Sec/Veh)	Maximum Delay (Sec/Veh)	Minimum Delay (Sec/Veh)	Average Max Queue (ft)	Maximum Queue (ft)	Minimum Queue (ft)
<b>NC 86 (MLK Blvd) and Estes Drive</b>	Signal	D	51.6	53.1	49.9			
Eastbound		E	57.1	63.0	49.5	575	650	425
Westbound		D	44.0	50.2	38.5	575	875	350
Northbound		E	59.8	62.7	57.9	675	700	625
Southbound		D	45.8	48.4	42.7	375	475	350
<b>Estes Drive and Somerset Drive</b>	Two-Way Stop	-	-	-	-	-	-	-
Northbound		F	76.4	113.7	46.6	200	275	125
Southbound		F	103.0	141.1	74.1	250	350	200
<b>Estes Drive and E. Franklin Street</b>	Signal	F	123.8	134.1	96.5			
Eastbound		F	88.0	93.5	78.7	775	1300	650
Westbound		F	146.5	168.6	115.0	1275	1450	1150
Northbound		F	193.8	227.5	133.4	1950	2400	1150
Southbound		E	72.1	78.0	63.7	850	875	750
<b>MLK Blvd and Future Aura Access #1</b>	Two-Way Stop	-	-	-	-	-	-	-
<i>Westbound</i>		A	5.4	6.4	4.2	25	25	25
<b>Estes Dr and Future Aura Access #2</b>	Two-Way Stop	-	-	-	-	-	-	-
<i>Southbound</i>		E	42.9	77.4	26.0	100	125	75
<b>NC 86 (MLK Blvd) and Local Rd Access (RIRO)</b>	Two-Way Stop	-	-	-	-	-	-	-
Westbound		C	21.3	30.1	14.5	50	100	25

Max Queue Lengths Calculated to Nearest Upstream Intersection/Node in Model – Queue May Exceed Distance Reported  
**RED** – Overall Intersection (Signalized) or Critical Movement (Unsignalized) Exceeds Town Operational Performance LOS Threshold  
**BLUE** – Proposed Aura Intersections/Approaches

The 2024 Build Scenario with Improvements model operational results are shown in **Table 5**. This includes all recommended improvements identified in the Aura TIA. These improvements include additional capacity and queue storage benefits for westbound Estes Drive at the NC 86 intersection, better performance for the proposed Aura Driveway along Estes Drive, and potentially some benefit for operations at the Estes Drive intersection with Somerset Drive and its potential fourth leg local access roadway connection – though additional mitigation would be needed to improve conditions in the 2024 PM peak hour at this location. Recommended improvements to the E. Franklin Street/Estes Drive intersection (a southbound right-turn lane on E. Franklin Street) do improve intersection capacity and reduce queue lengths, but do not completely mitigate anticipated PM peak hour congestion at this location.

**Table 5. 2024 Build Aura Scenario – With Recommended Improvements – Traffic Operations Results**

2024 Build-Aura Model - With Improvements		AM Peak Hour						
Intersection and Approach	Traffic Control	LOS	Average Delay (Sec/Veh)	Maximum Delay (Sec/Veh)	Minimum Delay (Sec/Veh)	Average Max Queue (ft)	Maximum Queue (ft)	Minimum Queue (ft)
<b>NC 86 (MLK Blvd) and Estes Drive</b>	Signal	<b>D</b>	<b>37.5</b>	<b>40.1</b>	<b>35.8</b>			
Eastbound		E	59.2	66.5	52.2	650	825	625
<i>Westbound</i>		C	38.7	41.9	36.8	250	300	200
Northbound		C	30.2	32.9	29.4	375	425	250
Southbound		C	28.8	30.2	27.9	375	500	300
<b>Estes Drive and Somerset Drive</b>	Two-Way Stop	-	-	-	-	-	-	-
Eastbound		-	-	-	-	-	-	-
Westbound		-	-	-	-	-	-	-
Northbound		B	13.2	15.7	11.1	50	50	25
Southbound		C	17.8	24.0	12.6	200	250	150
<b>Estes Drive and E. Franklin Street</b>	Signal	<b>D</b>	<b>42.7</b>	<b>46.3</b>	<b>36.5</b>			
Eastbound		D	54.9	66.5	38.2	650	725	400
Westbound		E	57.9	64.3	52.3	425	475	350
Northbound		C	31.0	33.2	27.8	225	275	150
<i>Southbound</i>		C	30.2	32.5	28.8	375	450	350
<b>MLK Blvd and Future Aura Access #1</b>	Two-Way Stop	-	-	-	-	-	-	-
Westbound		A	5.1	5.8	4.2	25	25	25
<b>Estes Dr and Future Aura Access #2</b>	Two-Way Stop	-	-	-	-	-	-	-
<i>Southbound</i>		B	14.1	17.7	11.2	50	75	25
<b>NC 86 (MLK Blvd) and Local Rd Access (RIRO)</b>	Two-Way Stop	-	-	-	-	-	-	-
Westbound		A	5.3	8.1	2.8	50	75	25

Max Queue Lengths Calculated to Nearest Upstream Intersection/Node in Model – Queue May Exceed Distance Reported  
**RED** – Overall Intersection (Signalized) or Critical Movement (Unsignalized) Exceeds Town Operational Performance LOS Threshold  
**GREEN** – New or Improved Intersection Approaches from Previous Scenario

**Table 5 (Continued). 2024 Build Aura Scenario – With Recommended Improvements**  
**Traffic Operations Results**

2024 Build-Aura Model - With Improvements	Traffic Control	PM Peak Hour						
		LOS	Average Delay (Sec/Veh)	Maximum Delay (Sec/Veh)	Minimum Delay (Sec/Veh)	Average Max Queue (ft)	Maximum Queue (ft)	Minimum Queue (ft)
<b>NC 86 (MLK Blvd) and Estes Drive</b>	Signal	D	47.4	51.2	45.6			
Eastbound		E	55.1	58.5	51.5	475	600	300
<i>Westbound</i>		D	38.1	40.6	36.5	425	500	325
Northbound		D	53.1	59.8	50.0	625	900	550
Southbound		D	45.1	49.8	41.8	375	525	325
<b>Estes Drive and Somerset Drive</b>	Two-Way Stop	-	-	-	-	-	-	-
Eastbound		-	-	-	-	-	-	-
Westbound		-	-	-	-	-	-	-
Northbound		F	56.9	74.6	45.6	150	250	100
Southbound		F	87.2	128.2	62.9	250	300	200
<b>Estes Drive and E. Franklin Street</b>	Signal	F	102.3	113.2	92.6			
Eastbound		F	88.8	95.6	83.4	750	1250	600
Westbound		F	144.2	191.1	113.3	1275	1325	1150
Northbound		F	135.7	189.6	86.3	1100	1525	700
<i>Southbound</i>		D	53.9	60.3	49.5	675	725	500
<b>MLK Blvd and Future Aura Access #1</b>	Two-Way Stop	-	-	-	-	-	-	-
Westbound		A	6.2	7.1	3.4	25	25	25
<b>Estes Dr and Future Aura Access #2</b>	Two-Way Stop	-	-	-	-	-	-	-
<i>Southbound</i>		D	31.1	41.3	25.6	75	100	50
<b>NC 86 (MLK Blvd) and Local Rd Access (RIRO)</b>	Two-Way Stop	-	-	-	-	-	-	-
Westbound		B	12.2	14.6	8.9	50	100	25

Max Queue Lengths Calculated to Nearest Upstream Intersection/Node in Model – Queue May Exceed Distance Reported  
**RED** – Overall Intersection (Signalized) or Critical Movement (Unsignalized) Exceeds Town Operational Performance LOS Threshold  
**GREEN** – New or Improved Intersection Approaches from Previous Scenario

Per Town staff direction, two additional scenarios related to traffic control alternatives at the Estes Drive intersection with Somerset Drive were developed and model run results are shown in **Table 6**. The addition of a two-phase traffic circle, coordinated with the existing signals along Estes Drive, performs acceptably in both peak hours. The implementation of a single lane roundabout at this location performs well in the AM peak hour but may operate near capacity in the PM peak hour. Both alternatives improve the ability for minor street traffic from Somerset Drive and the potential future local roadway connection to the south to gain access to Estes Drive compared to the existing two-way stop control scenario. Management of queues along the high volume Estes Drive corridor caused by either the roundabout or traffic signal is an important consideration.

**Table 6. 2024 Build With Improvements Scenario – Somerset Drive Traffic Control Alternatives**

2024 Build-Aura Model - With Improvements		AM Peak Hour						
Intersection and Approach	Traffic Control	LOS	Average Delay (Sec/Veh)	Maximum Delay (Sec/Veh)	Minimum Delay (Sec/Veh)	Average Max Queue (ft)	Maximum Queue (ft)	Minimum Queue (ft)
<b>Estes Drive and Somerset Drive</b>	<i>Signal</i>	<b>A</b>	<b>4.1</b>	<b>5.1</b>	<b>3.4</b>			
Eastbound		A	2.9	3.3	2.4	75	100	50
Westbound		A	1.8	3.5	1.0	175	250	150
Northbound		F	75.8	92.3	63.3	75	100	50
Southbound		F	73.2	88.5	52.1	50	75	25
<b>Estes Drive and Somerset Drive</b>	<i>Round about</i>	<b>C</b>	<b>22.3</b>	<b>23.4</b>	<b>21.2</b>			
Eastbound		D	26.4	28.7	25.0	375	450	275
Westbound		C	16.4	17.2	15.5	275	300	225
Northbound		B	12.6	14.4	10.7	200	250	175
Southbound		B	10.1	11.9	8.6	150	175	125
2024 Build-Aura Model - With Improvements		PM Peak Hour						
Intersection and Approach	Traffic Control	LOS	Average Delay (Sec/Veh)	Maximum Delay (Sec/Veh)	Minimum Delay (Sec/Veh)	Average Max Queue (ft)	Maximum Queue (ft)	Minimum Queue (ft)
<b>Estes Drive and Somerset Drive</b>	<i>Signal</i>	<b>B</b>	<b>19.7</b>	<b>21.5</b>	<b>16.8</b>			
Eastbound		A	9.6	10.6	8.8	425	525	350
Westbound		B	17.4	21.8	12.0	175	250	150
Northbound		F	61.7	65.2	56.0	250	200	250
Southbound		E	56.2	58.5	54.6	675	1000	600
<b>Estes Drive and Somerset Drive</b>	<i>Round about</i>	<b>E</b>	<b>35.5</b>	<b>38.4</b>	<b>31.7</b>			
Eastbound		C	23.4	24.9	21.0	300	400	250
Westbound		E	47.2	54.3	40.6	425	600	375
Northbound		B	11.4	15.8	6.5	200	225	150
Southbound		D	27.4	35.5	21.6	150	175	125

Max Queue Lengths Calculated to Nearest Upstream Intersection/Node in Model – Queue May Exceed Distance Reported  
*GREEN* – New or Improved Intersection Approaches from Previous Scenario