Amy Harvey

From: Jeanette Coffin
Sent: Tuesday, February 01, 2022 3:24 PM
To: wpein@nc.rr.com
Cc: Colleen Willger; Sarah Vinas; Adam Searing; Amy Ryan; Camille Berry; Jeanne Brown; Jess Anderson; Karen Stegman; Michael Parker; Pam Hemminger; Paris Miller-Foushee; Tai Huynh; Amy Harvey; Ann Anderson; Carolyn Worsley; Laura Selmer; Loryn Clark; Mary Jane Nirdlinger; Maurice Jones; Rae Buckley; Ran Northam; Ross Tompkins; Sabrina Oliver
Subject: FW: West Franklin Street Petition
Attachments: W Franklin Concept.pdf

Thank you for your correspondence with the Town of Chapel Hill. The Mayor and Town Council are interested in what you have to say. By way of this email, I am forwarding your message to the Mayor and each of the Council Members, as well as to the appropriate staff person who may be able to assist in providing additional information or otherwise addressing your concerns.

Again, thank you for your message.

Sincerely,

Jeanette Coffin

Jeanette Coffin
Office Assistant
Town of Chapel Hill Manager's Office
405 Martin Luther King Jr. Blvd.
Chapel Hill, NC 27514
(o) 919-968-2743 | (f) 919-969-2063

From: Wayne Pein <wpein@nc.rr.com>
Sent: Tuesday, February 1, 2022 12:35 PM
To: Town Council <mayorandcouncil@townofchapelhill.org>
Subject: West Franklin Street Petition

Dear Mayor and Council,

Petition: Do not reallocate West Franklin Street to include bicycle facilities, which would manufacture many conflicts. The original 4-lane is the safest configuration.

Attached is a detailed paper describing the advantages of the current

(pre-pandemic) configuration and the problems that will be created by the potential proposed changes.

I was a bicycling researcher at the UNC Highway Safety Research Center. Among many other projects, I conceptualized and was the primary executor of this nationwide sample collision report for the FHWA.
https://www.fhwa.dot.gov/publications/research/safety/pedbike/96104/

Wayne Pein
204 Ridgecrest Drive
919-942-6051

West Franklin Street Proposed Bicycle Facilities

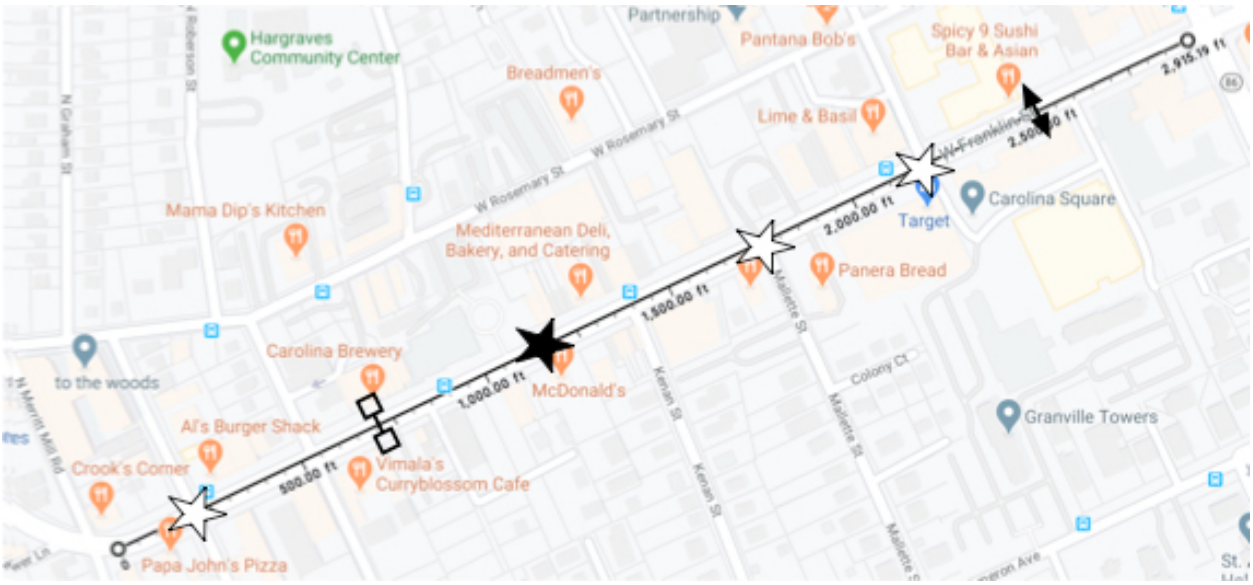
Wayne Pein
wpein@nc.rr.com

January 28, 2022

Road Conditions.

West Franklin Street from Merritt Mill Road to the stop bar at Columbia Street is about .55 mi (2915 ft) long. It is down or uphill in both directions. W. Franklin St. descends east from Graham Street at 1.5% for .30 miles to the low point at Mallette Street and west from Columbia Street to Mallette St. at 2.4% for .25 miles. It is 56' wide curb face to face.

Posted speed limit is a low 20 mph. Between the signalized Merritt Mill Rd. and Columbia St. end points, there are 5 more traffic signals — at Graham St., McDonald's, Mallette St., Church St., and Chase Bank — that average less than 0.1 miles apart and reduce motorist speeds (Spot, Running, Journey, Time Mean, and Space Mean speeds. See Appendix A.)



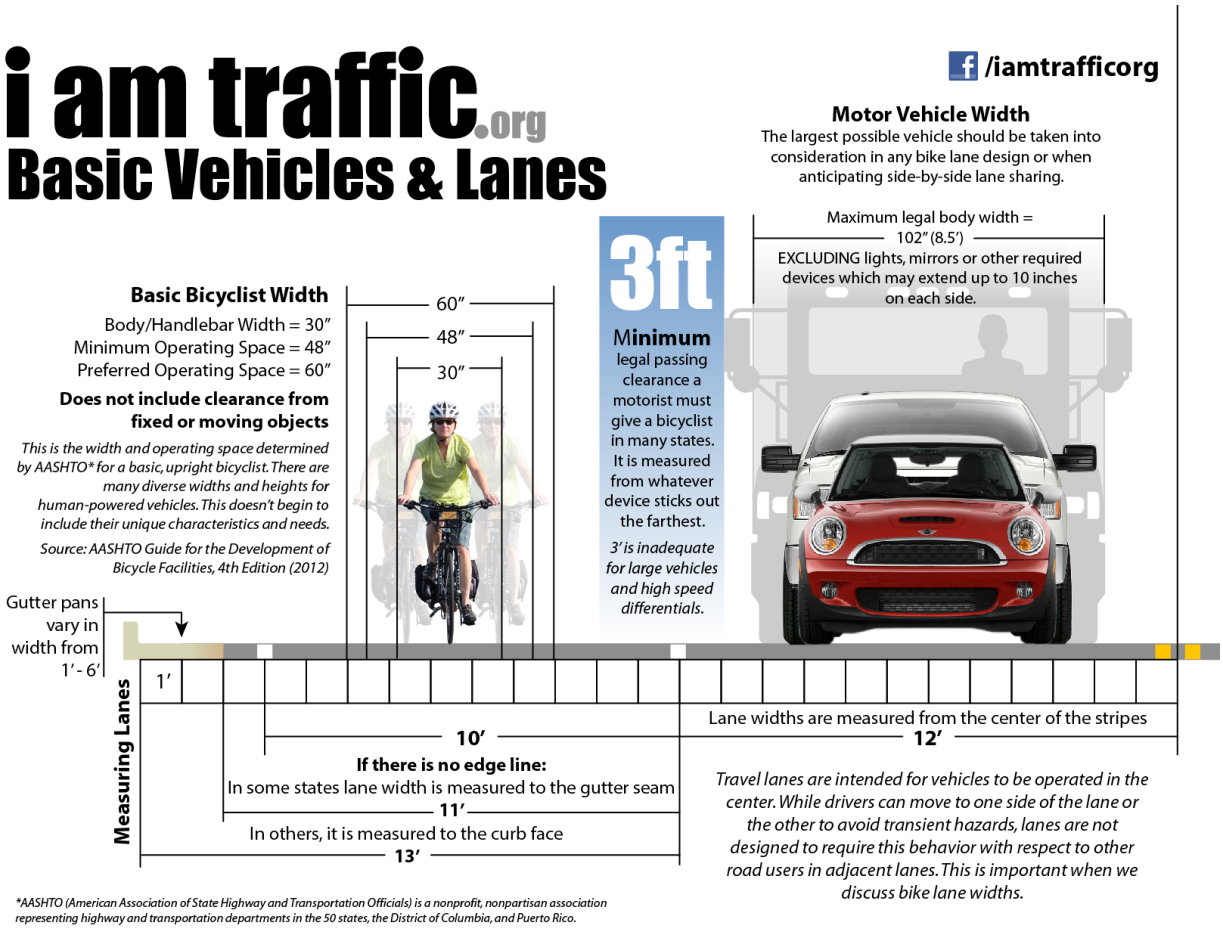
Another signalized crosswalk (shown as a "dumbbell") in the 400 block would make 8 nearly evenly spaced potential stops. Correctly built Speed Tables as crosswalks would enable a traverse speed of 25-27 mph when pedestrians are not present. Likely they could be designed for 20 mph.
https://www.ite.org/pub/?id=2c8edbfb%2D0c48%2Db1f3%2Dc506%2D9e8e72dd3992

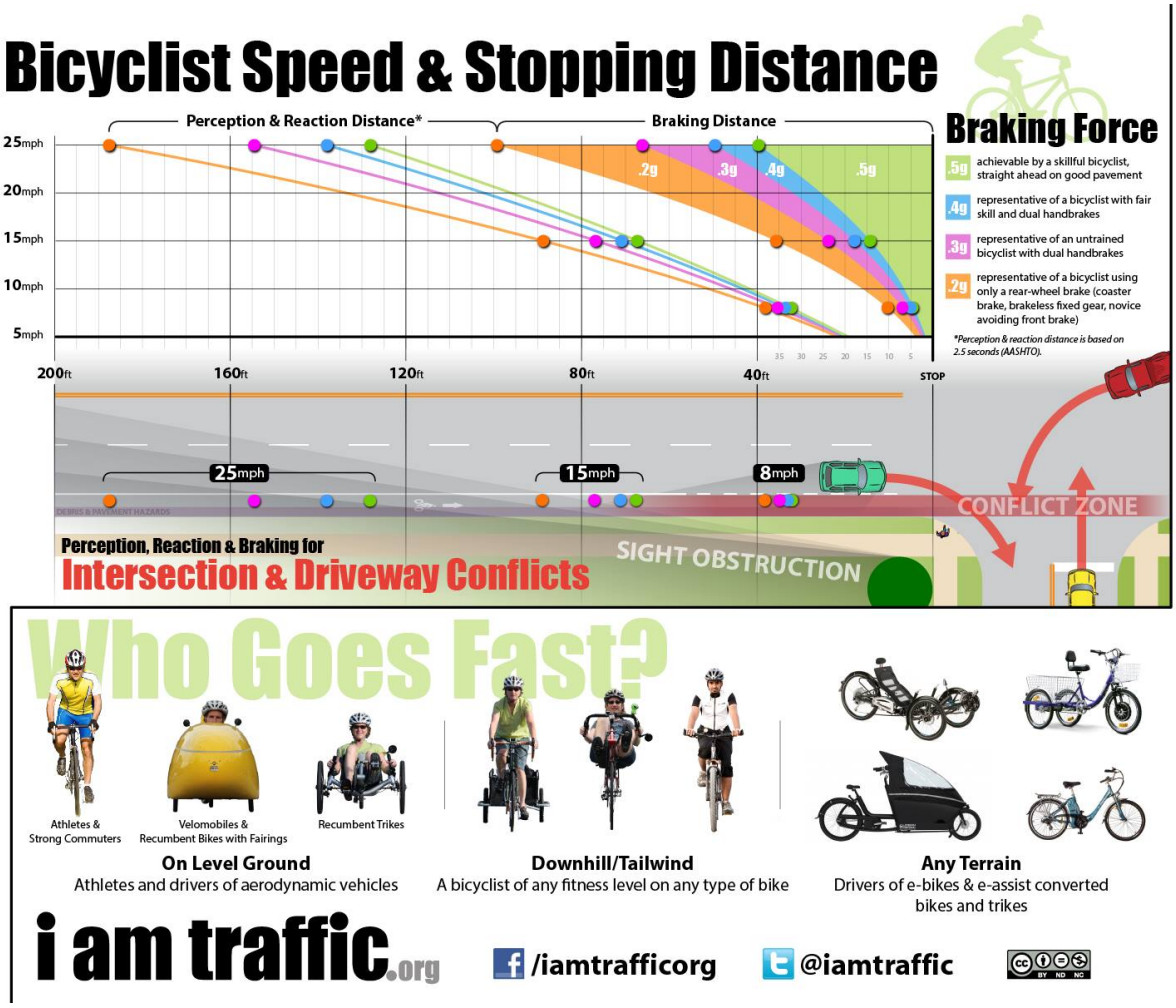
Unlike the improperly designed so-called 15 mph "Speed Tables" throughout Town, they should have flat approach ramps and a flat 10-foot mid-section for pedestrian stability and higher traverse speed.
https://www.townofchapelhill.org/home/showdocument?id=3174

Bicyclist Characteristics.
Per state law §20-4.01(49) bicycles are vehicles, bicyclists are drivers of vehicles, and bicyclist movements are governed by the rules for vehicle movement. Bicycles have the operating characteristics and design requirements of vehicles such as speed, stopping distance, sight distance, stopping sight distance, operating space, and shy buffers.

Bicyclists are 2.5' wide, but because they are single track, have a natural wobble due to pedaling and are subject to natural and motor vehicle wind blast, their moving footprint is considerably wider.

Bicyclists are not pedestrians with wheels. Bicycles cannot stop or move sideways or backwards instantly like a pedestrian. Pedestrians have their own, different operating laws.



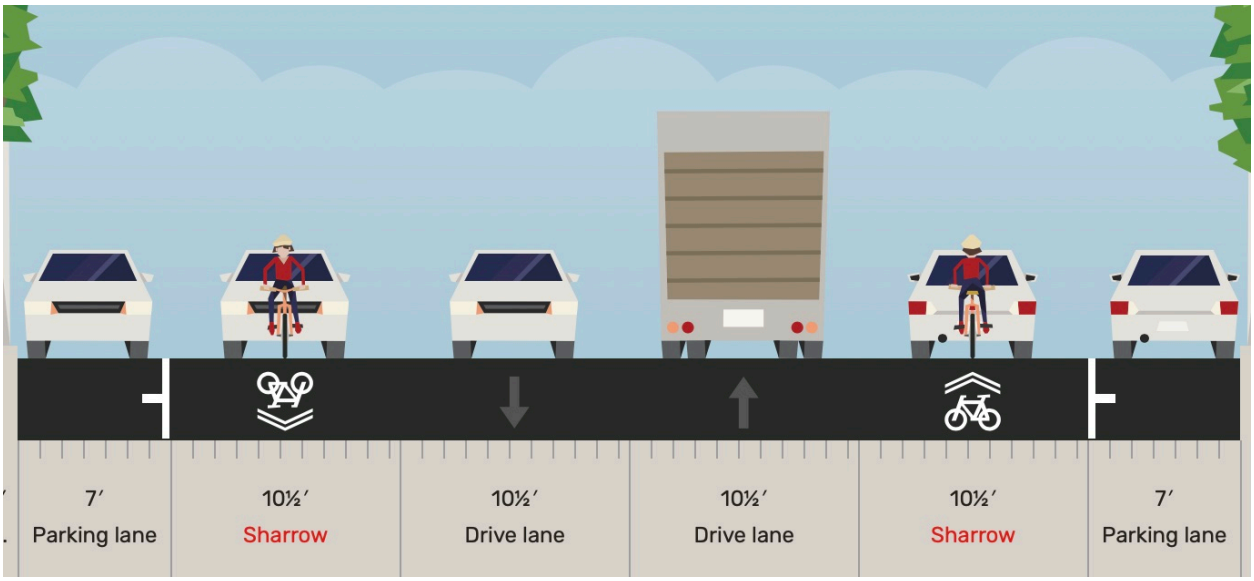


Because of the downslopes on W. Franklin St. bicyclists can achieve or exceed the 20 mph speed limit with little or even no effort. They will be slower on the upslopes, though strong or e-bike riders may be able to achieve 20 mph.

Following is an analysis of the movements and conflicts of the existing condition, Option E, and of potential reallocations Option A and Option C. How would the options work?

Attention! In all Streetmix.net created images below, the software incorrectly depicts bicyclists as just 2' wide (they are actually physically 2.5' with a 4' "wobble space"), cars a narrow 6' wide, and trucks just 7.5' wide rather than an actual 8.5' (not including mirrors). These errors make it appear that there is more distance between vehicles than is actually the case.

Option E: Existing Configuration (pre-pandemic).



Curb face-to-face is 56'. Shared Lane Markings (Sharrows), which are similar to bike lane markings, are shown to portray and highlight optimal user behavior. They could have been placed lane center a decade ago to reinforce bicyclist legitimacy and to provide ongoing education to all road users. BICYCLISTS MAY USE FULL LANE signs (R4-11) with CHANGE LANES TO PASS placards could also be placed.

1. Bicycle drivers should control the right lane as do motorcyclists and other drivers, setting the speed of following traffic. If a bicyclist does 10 mph trailing motorists must do 10 mph. Lane control results in maximum visibility and creates a maximally wide personal Space Cushion — a safety buffer — on bicyclists' left and right. Lane control is a defensive bicycling (and motorcycling) strategy that does not require any special skills, strength, or high bicycle speed. In essence, bicyclists use the lane as if it is a 10.5" wide bike lane. See also:
https://bicyclingmatters.wordpress.com/infrastructure/the-space-cushion/.

2. Motorists using the right lane change lanes left to pass bicycle drivers and other right lane users, including those delivering goods, parallel parking or pulling out, as needed.

3. Motorists wishing to parallel park or turn right, and thru bus drivers use the right lane and have no crossing conflicts with bicyclists.

A female cyclist controlling the lane eastbound. December 2003.

MAY USE FULL LANE pavement markings. Encinitas, CA.


MAY USE
FULL LANE
CHANGE LANES
TO PASS
MAY USE
FULL LANE
CHANGE LANES
TO PASS

Ferguson, MO.

Very large 30 km/h (18.6 mph) and bicycle markings span the shared lane. Madrid, Spain.

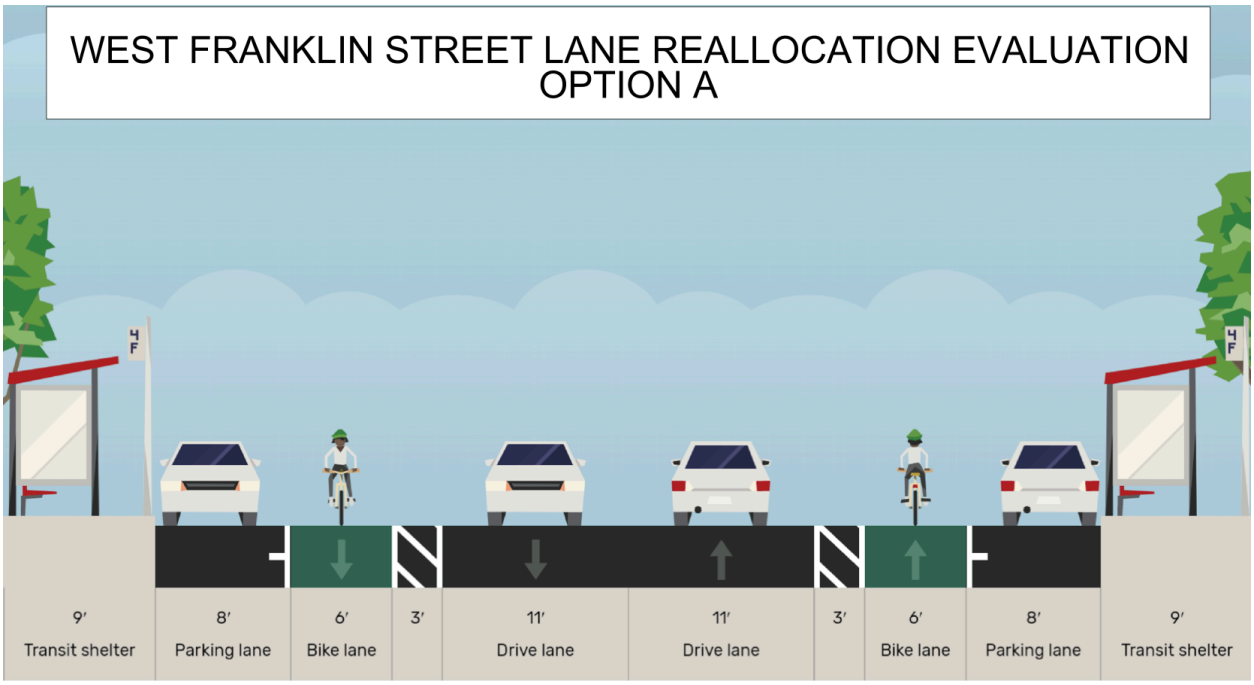
Summary of Option E.
The original pre-pandemic Existing Configuration of West Franklin Street provided normal and optimal traffic operations and the most safety, mobility and access for bicyclists and all vehicle drivers.

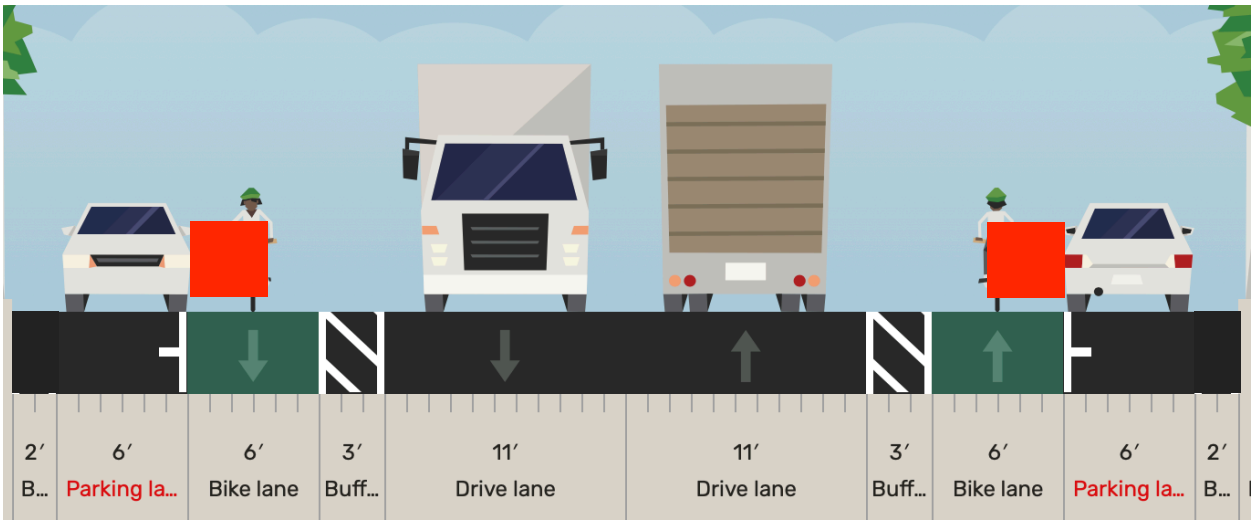
In this configuration, lane-controlling bicyclists do not encounter any more conflicts than any other vehicle driver, and have the greatest visibility and vantage. Such bicyclists also have maximum space to take advantage of their narrow profile and great maneuverability to avoid and reduce conflicts. I have safely operated like this since 1986.

Bicyclists who do not lane control and operate at the edge of the lane near parked vehicles invite close passing within the lane, are less conspicuous, have poorer vantage, and have less maneuvering space.These conditions result in increased risk of Sideswipe, Dooring, Left Cross, Right Hook, and DriveOut type collisions.

As noted previously, a signaled pedestrian crosswalk could be placed in the 400 block roughly midpoint between Graham St. and the McDonald's crosswalk to facilitate crossing. This would result in 8 signals in .55 miles.

Option A: Door Zone Bike Lane.





The top image was produced by Town staff. I drew the lower image which more realistically shows parked vehicles abutting the parking line with red doors extending as much as 3.5', and trucks (or busses) rather than cars.

This reallocation changes the right lane from a multi-user lane into a bicyclist exclusive lane. It is a quasi 4-lane road, but motorists are restricted into a single lane in each direction. This greatly alters traffic operations for the worse, and manufactures a number of crossing conflicts that did not previously exist and increases the risk of inherent conflicts.

1. Right Hooks. Motorists normally make right turns from the right lane. With bike lanes present, motorists must turn across the bike lane, creating the risk of Right Hook collisions. Drivers stopped or slowed in a queue may do this suddenly and encounter faster bicyclists passing on the right.

2. Parallel Parking. Motorists wishing to park normally drive in the right lane. With bike lanes, motorists will quickly merge or turn into or across the bike lane to parallel park, conflicting with any bicyclists present. Motorists entering and exiting parallel parking will block the bike lane.

Depiction that a Bike Lane creates a manufactured conflict -
a Right Hook collision course by design.

3. Motor Vehicle Occupants. Parallel parked drivers and passengers will encroach on the bike lane when entering and exiting their vehicles, and may linger ambiguously in the bike lane or buffer as a waiting area before attempting to cross the street midblock.

4. Bus Conflicts. There will be 2 manufactured conflicts at each bus stop. Busses will cross over the bike lane to discharge or pick up passengers at the curb, then cross again to merge back into the “Drive Lane.”

Because motorists will be condensed into a single “Drive Lane,” that lane density will be doubled. This exacerbates multiple issues:

5. Left Crosses. There will be increased likelihood for bicyclists to be screened by adjacent motor vehicles to their left, which increases the risk of Left Cross collisions from oncoming, left turning motorists.

6. Drive Lane Re-entry. It will be more difficult returning to the “Drive Lane” for bus drivers after picking up or discharging passengers and for drivers leaving parallel parking.

7. Bicyclist Left Turns. These are more difficult due to reduced gap opportunity to merge left into the single denser “Drive Lane.”

8. Bicyclist Passing. Bicyclists blocked by vehicles entering or leaving parallel parking will have more difficultly passing because the single “Drive lane” will have double the density.

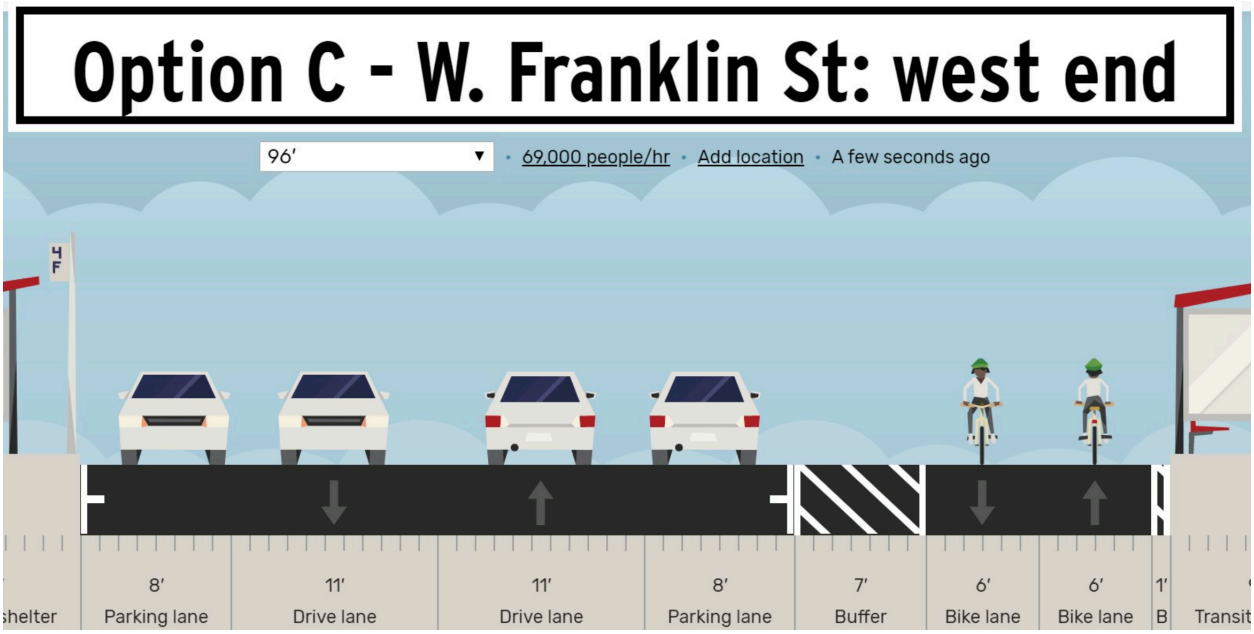
9. Longer Queues. All motor vehicles in a single lane will result in longer queues at signals and when making making a left turn at intersections and driveways. Impatient trailing motorists may pass on the right using the bike lane to reach a right turn, conflicting with any bicyclists present.

10. Dooring. The bike lanes are partially in the Door Zone. Parked vehicles’ sides can abut the parking lane line, and opened doors will extend into the bike lane. If instead of a 6’ bike lane and 3’ of buffer the allocations are instead 2’ buffer - 5’ bike lane - 2’ buffer as shown in the RKA Pavement Marking Plan, there would be less intrusion into the Bike Lane from car doors, but there would still be a Dooring collision risk.
https://www.townofchapelhill.org/home/showpublisheddocument/45742/637237701527500000

Opened door strikes are injurious and sometimes fatal. The likelihood of Dooring is increased with bicyclist speed and parking turnover.

Summary of Option A.
This option greatly worsens traffic operations for bicyclists, motorists, and bus drivers by manufacturing and increasing conflicts and collision risk and removing degrees of freedom to maneuver. Territorial sentiments would flair as bicyclists in the “Drive Lane” would be seen as persona non grata by motorists, and motorists would be seen as encroaching on bicyclist space when crossing or blocking the bike lane.

Option C: “Cycle Track.”



Produced by the Town, the dimensions add to 58’ but the cross section curb face to face is actually 56’.

This configuration features a 2-way “Cycle Track” separated behind parking on the west end, and has Bike Lanes on the east end. Westbound bicyclists “transition” between the two at Mallette St. via a “2-phase turn.” It suffers many of the same flaws as Option A and Option B (which Town staff dropped Town due to access and safety issues) while adding others.

1. Pedestrians-On-Wheels. This option treats bicycle drivers like wheeled pedestrians; vehicular style left turns are not possible. It is not reasonable or safe for bicyclists to stop at breaks in parking and merge into the single lane to then make a left. They must cross at 90 degrees like pedestrians. Access to the north side is severely restricted.

2. Right Hook and Left Cross. Motorists turning right or left across the bike path will encounter bicyclists from two directions followed by pedestrians from two directions. Worse, the bicyclists will be obscured behind parked vehicles, and can be fast moving at 20 mph (29 ft/sec). Bicyclists will also visually blend with roadside elements, making them less noticeable. These factors result in a high risk of collision. Pedestrians crossing the driveway may result in the stopped motorist blocking the bike path.

3. Long Delays. Cars being parallel parked will block the single thru lane.

4. Motorist Pedestrians. Parked car occupants will constantly cross the 2-way bike path, creating numerous conflicts with bicyclists that previously did not exist.

5. Exiting Drivers. Drivers exiting and entering the parked vehicle will have increased conflict with double density motor vehicles in the single thru lane, which also have less freedom to move over and create space.

6. Buses. Buses will block the bike path or their passengers will cross two directions of bicyclists.

7. Momentum and Time Killer. West bound bicyclists on the east end descending toward Mallette St. at 20 mph will have to stop to make a 2-phase left to continue on the south side bike path, losing time and momentum, and then start from a stop to ascend. Not addressed is how those desiring to access E. Main St. in Carrboro will have to “transition” back to the right side of the road.

8. Blinded by the Light. At night, west bound bicyclists on the bike path may be blinded by the headlights of eastbound motor vehicles entering and exiting parking, making right turns. Eastbound thru motor vehicle headlights could also be problematic.

9. DriveOut Collision Risk. On the west end, eastbound bicyclists will descend at 20 mph (29 ft/s) next to the curb. Motorists exiting driveways must cross the bike path, then may stop in the buffer and parking lane prior to entering thru traffic. Bicyclists will be greatly vulnerable to these motorists nosing out at driveways. The tail of the motor vehicle may block the westbound bike path.

Summary of Option C.
This configuration treats bicycle drivers as pedestrians with wheels, makes bicycling slower, more cumbersome, less convenient, and manufactures additional conflicts over the pre-pandemic road design, creating high risk of collision. It would be difficult to conceive of a more bicyclist-hostile configuration.

Conclusions.

The justification for West Franklin St. bicycle facilities is this generic language from the Town's website:
https://www.townofchapelhill.org/government/departments-services/town-manager/downtown-investments/w-franklin-st-lane-reallocation

> "What is a Lane Reallocation?
> Lane reallocations are when vehicle lanes are repurposed for bike lanes, parking, loading zones, turn lanes or other amenities. They are relatively low cost ways to achieve safety, mobility, and access for all transportation modes. Many lane reallocation projects have resulted in significant increases in the number of pedestrians and bicyclists, more customers and higher sales revenue for local businesses, and decreases in speeding and crashes along the corridors."

Although "Town staff have been considering W. Franklin St. for lane reallocation for a number of years, and it is a recommended project in the Mobility and Connectivity Plan," "…safety, mobility, and access for all transportation modes" is claimed without supporting evidence. There was no project team collision or conflict analysis showing a current lack of safety, no realization that bicyclists have been safely using the 20 mph road for decades, or any explanation of the impact of the proposals on traffic operations, movements, and conflicts.

There is no publicized data on motorist Spot, Running, Journey, Time Mean, and Space Mean speeds (Appendix A).There is no mention of bicycle speed, or any other bicycle operating metric, as if bicyclists are not active participants in traffic.

There are no projections of "…increases in the number of pedestrians and bicyclists, more customers and higher sales revenue for local businesses, and decreases in speeding and crashes along the corridor." There is only the claim that projects elsewhere have shown improvements. Where's the data for West Franklin Street?

Given these overt omissions, it is reasonable to conclude that a scheme to repurpose the right lanes into bike lanes is little more than identity politics traffic engineering. It seems that the mere appearance of comfort and safety via a bicycle specific facility is conflated with the provision of actual safety. With these proposals, it's danger that would be constructed.

Appendix A

https://nptel.ac.in/content/storage2/courses/105101008/511_FundParams/point4/point.html

Spot Speed

Spot speed is the instantaneous speed of a vehicle at a specified location. Spot speed can be used to design the geometry of road like horizontal and vertical curves, super elevation etc. Location and size of signs, design of signals, safe speed, and speed zone determination, require the spot speed data. Accident analysis, road maintenance, and congestion are the modern fields of traffic engineer, which uses spot speed data as the basic input. Spot speed can be measured using an enoscope, pressure contact tubes or direct timing procedure or radar speedometer or by time-lapse photographic methods. It can be determined by speeds extracted from video images by recording the distance traveling by all vehicles between a particular pair of frames.

Running speed

Running speed is the average speed maintained over a particular course while the vehicle is moving and is found by dividing the length of the course by the time duration the vehicle was in motion. i.e. this speed doesn't consider the time during which the vehicle is brought to a stop, or has to wait till it has a clear road ahead. The running speed will always be more than or equal to the journey speed, as delays are not considered in calculating the running speed

Journey speed

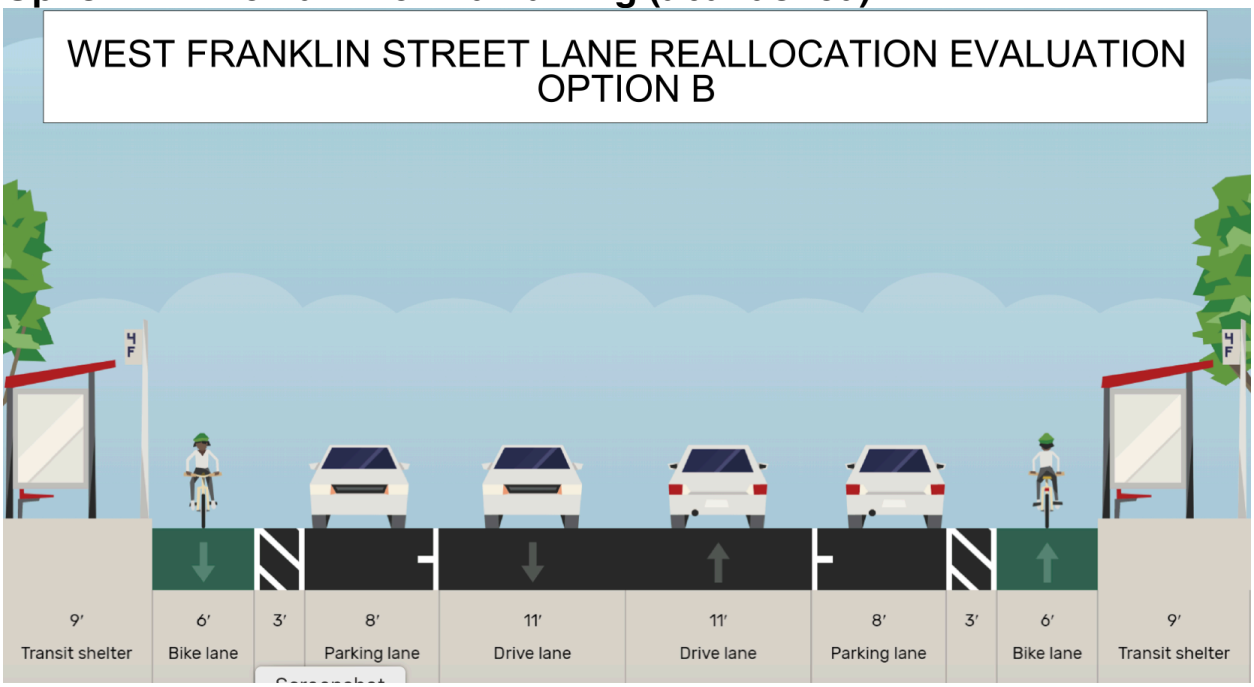
Journey speed is the effective speed of the vehicle on a journey between two points and is the distance between the two points divided by the total time taken for the vehicle to complete the journey including any stopped time. If the journey speed is less than running speed, it indicates that the journey follows a stop-go condition with enforced acceleration and deceleration. The spot speed here may vary from zero to some maximum in excess of the running speed. A uniformity between journey and running speeds denotes comfortable travel conditions.

Time mean speed and space mean speed

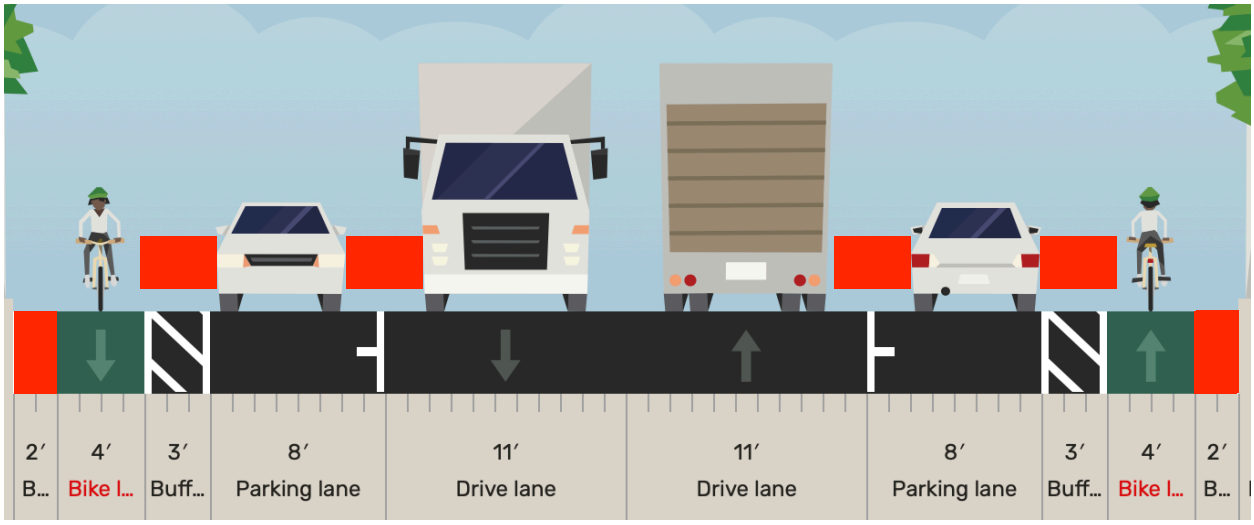
Time mean speed is defined as the average speed of all the vehicles passing a point on a highway over some specified time period. Space mean speed is defined as the average speed of all the vehicles occupying a given section of a highway over some specified time period. Both mean speeds will always be different from each other except in the unlikely event that all vehicles are traveling at the same speed. Time mean speed is a point measurement while space mean speed is a measure relating to length of highway or lane, i.e. the mean speed of vehicles over a period of time at a point in space is time mean speed and the mean speed over a space at a given instant is the space mean speed.

Addendum

Option B: Bike Path Behind Parking (abandoned)



The above image was produced by the Town. The following image is a more realistic rendition showing doors, which on some vehicles can open as much as 3.5”, and 2’ of buffer bicyclists require from vertical curb faces.



This type of bicycle facility is often called a “protected bike lane.” But since it is behind parking, it’s not a lane but rather a semi-segregated path, and “protected” is a misnomer. This configuration substantially changes traffic operations, manufactures conflicts that did not previously exist and greatly increases the existing risk of conflict and collision.

1. Pedestrians On Wheels. This option treats bicycle drivers like wheeled pedestrians; vehicular style left turns are not possible. It is not reasonable or safe for bicyclists to stop at breaks in parking and merge into the single lane to make a left. They must cross at 90 degrees like pedestrians .

2.Right Hook. Motorists making right turns will cross the bike lane and encounter unseen bicyclists hidden behind the parked cars. Bicyclists don't see the turning motorists either. This is a serious conflict and Right Hook collision risk that did not previously exist.

Right Hook fatality.

3. Left Cross. Motorists making left turns will accelerate through denser traffic in the single opposing lane and will not have the time or space to stop before encountering unseen fast moving bicyclists previously hidden by parked vehicles. Bicyclists won't see the turning motorists. Left Cross collision risk will be greatly increased.

4. Long Delays. Cars being parallel parked will block the single thru lane.

5. Motorist Pedestrians. Parked car occupants will constantly cross the bike lane, creating numerous conflicts with bicyclists that previously did not exist. Some pedestrians will be unseen when emerging from between parked vehicles. A 29 feet per second (20mph) collision with these pedestrians will be devastating for both.

6. Exiting Drivers. Parked drivers exiting and entering the vehicle will have increased conflict with double density motor vehicles in the single thru lane, which also have less freedom to move over and create space.

7. Loading Zone. Delivery workers to businesses will cross the bike lane, creating new conflicts.

8. Buses. Buses will block the bike lane.

Summary of Option B.
This option was abandoned because it is fatally flawed and conflict plagued. With parked vehicles as visual obstructions, bicyclists and motorists don't see each other until the moment before a crossing conflict at every junction. Motor traffic will be severely delayed. There is even less freedom of mobility than under Option A.

Amy Harvey

From: Jeanette Coffin
Sent: Wednesday, February 02, 2022 5:00 PM
To: Geoffrey F. Green
Cc: Colleen Willger; Dwight Bassett; Adam Searing; Amy Ryan; Camille Berry; Jeanne Brown; Jess Anderson; Karen Stegman; Michael Parker; Pam Hemminger; Paris Miller-Foushee; Tai Huynh; Amy Harvey; Ann Anderson; Carolyn Worsley; Laura Selmer; Loryn Clark; Mary Jane Nirdlinger; Maurice Jones; Rae Buckley; Ran Northam; Ross Tompkins; Sabrina Oliver
Subject: RE: Franklin Street bike lanes

Thank you for your correspondence with the Town of Chapel Hill. The Mayor and Town Council are interested in what you have to say. By way of this email, I am forwarding your message to the Mayor and each of the Council Members, as well as to the appropriate staff person who may be able to assist in providing additional information or otherwise addressing your concerns.

Again, thank you for your message.

Sincerely,

Jeanette Coffin

Jeanette Coffin
Office Assistant
Town of Chapel Hill Manager's Office
405 Martin Luther King Jr. Blvd.
Chapel Hill, NC 27514
(o) 919-968-2743 | (f) 919-969-2063

-----Original Message-----
From: Geoffrey F. Green <geoff@stuebegreen.com>
Sent: Wednesday, February 2, 2022 4:41 PM
To: Town Council <mayorandcouncil@townofchapelhill.org>
Subject: Franklin Street bike lanes

Dear Mayor and Council members:

I am writing about the report given to you today by RKA regarding the number of bicycle parking spaces that would be lost for a curbside bicycle lane in order to ensure adequate safety and the reduction of conflicts between cars entering and exiting the intersections and bicycles. On the one hand, I think it is a fair analysis of the amount of parking that would go away. I had not realized just how many curb cuts there are and the number of small parking spaces. (I do wish,

if this is a critical issue, that this piece of easily-discovered information could have been provided to Council during the months this has been discussed.)

On the other hand, it's 50 car parking spaces for a bike lane through the core of the Town. The Town just spent close to $40 million on a parking deck with 1,000 spaces and plans to build another parking deck downtown. What's 50 spaces for safe passage for bicyclists?

I assume the plans for the traffic-running lane will include sufficient buffer between the parking lane and the bicycle lane to eliminate dooming conflicts. Despite that, this is a heavily traveled area with cars that are going to be crossing over the bike lane all the time, either trying to get to parking or leaving parking. Parked cars will undoubtedly try to pull out and look for the gap in cars perhaps and may not notice a bike approaching, as happens now in crosswalks with pedestrians. (That's currently a fear I have biking down Franklin Street, the car in a parking space with its taillights on — is it going to see me? Is it trying to come out? Or is it parked?) A traffic running bike lane is going to be neither safe nor comfortable and it will not encourage people to ride their bikes downtown. At all times, bicyclists will be precarious situation balanced between cars that will *legally* be allowed to cross through their lane. Personally, speaking just for myself, I would rather have four lanes with parking than two lanes with bike lanes and parking, because I'm comfortable and foolish enough to ride in the middle of a travel lane and I have an e-bike that can mostly keep up with traffic. But I recognize that I'm in the small minority. A four-lane configuration is good only for me and the small number of people confident to do so, not the vast majority of people who do or could or might ride bicycles.

My preferred option would be to move forward with the curb-running with a change to the plans. RKA makes the good point that "Even if the amount of on-street parking were not a concern, removing the parking spaces would eliminate the benefits of curb-running bike lanes, notably little parking protection and a wider road with unusable pavement." So the plan should include substitute protection from a physical barrier like bollards; those do not have the same sight-impairment issues as an automobile. Because frankly, having a bike lane in a place downtown without some sort of physical barrier is not going to cut it.

The traffic-running option is not going to improve safety adequately, encourage bicyclists, and may lead to the same type of serious crashes as occurred recently downtown. I urge you to move forward with the curb-running configuration with the identified reduction in parking and substitute physical barriers installed to protect bicyclists. Because if you can't take away 50 parking spaces after building a 1,100 space parking deck, about a week after a bicyclist was seriously injured riding downtown, when will you?

- geoff