



TOWN of BROOKLINE
Massachusetts
Department of Public Works

Andrew M. Pappastergion
Commissioner

MEMORANDUM

TO: Select Board

FROM: Todd M. Kirrane
Transportation Administrator

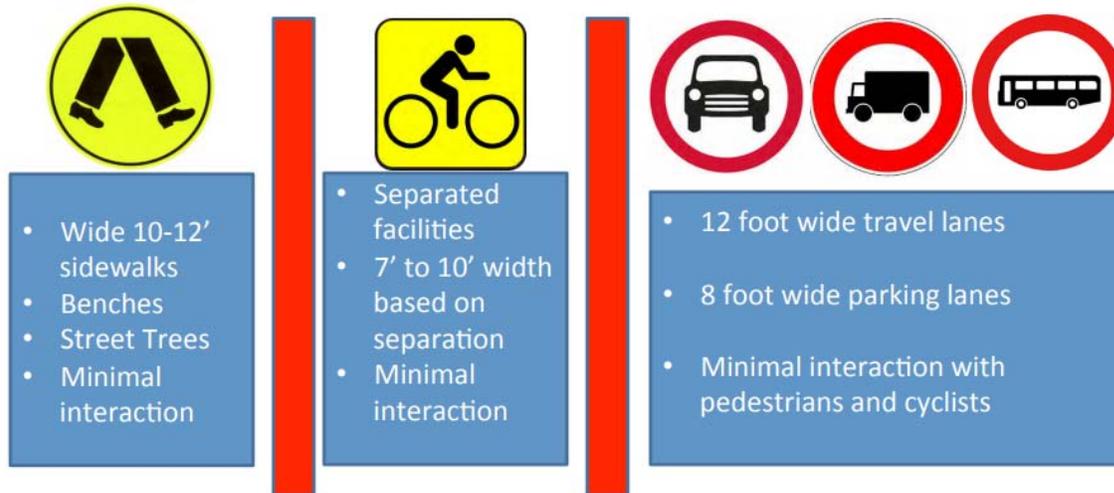
DATE: March 9, 2018

SUBJECT: March 12, 2018 Meeting of the Select Board

In March 2015 the Bicycle Advisory Committee hosted the *"Bicycling in Brookline: Where Are We? Where Should We Go?"* community discussion with staff from the Transportation Division, Police Department, Transportation Board Chair Safer, Bicycle Advisory Committee Chair Cynthia Snow, and community members. In my presentation I tried to demonstrate the problems that staff has in retrofitting our current streets into complete streets by showing the two slides below. They show that in an ideal world we would have adequate space for all roadway users including pedestrians, cyclists, and motorists plus additional space for tree lawns, ornamental lighting, benches, etc. No street or project to date in Brookline has best resembled the right of way constraints with the push/pull on providing safe and adequate accommodations for all roadway users than Babcock Street. Staff has attempted to find solutions that satisfy the ideals of as many users as possible, but at 30 feet curb to curb with existing mature trees there is no design in which we can satisfy the demands of all roadway users. Therefore all of the options that were left on the table for the Transportation Board to choose from on January 22, 2018 would result to less than ideal conditions for one, or more, roadway users.

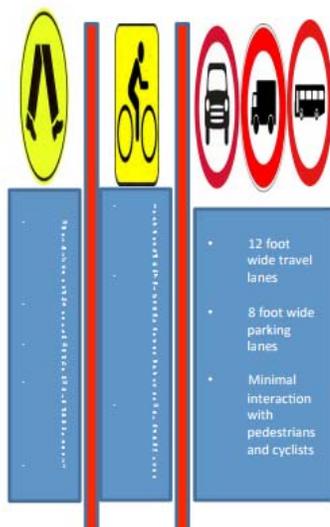
An Ideal World.....

In all roadway designs would allow for the maximum possible space to meet the goals of the various roadway users



Real World Constraints.....

In all roadway designs we must strike a balance between the many users including pedestrians, cyclists, motorists, trucks, buses, etc.



- Reducing the number of and width of travel lane widths to allowable minimums under state and federal guidelines
- Reducing parking lanes to 7' minimums allowable under state and federal guidelines
- Use of at grade bicycle lanes or sharrows
- Narrower sidewalks

TRANSPORTATION BOARD MEETING AND FINAL DECISION ON JANUARY 22, 2018

Following your 5 to 0 vote to remand the Babcock Street project back to the Transportation Board for a second planning process staff developed the 4 initial 2017 plans which were reviewed at the Bicycle Advisory Committee, the Pedestrian Advisory Committee, the Babcock Street Public Hearing, and the Transportation Board meeting on November 27th. Staff provided the plans to the Brookline Police Department and Department of Public Works and asked them to provide letters to the Board for the Transportation Board's November 27th meeting. Additionally staff met with the Brookline Fire Department to review the plans, the impacts on their apparatus at intersections, and requested a letter to the Transportation Board for the November 27th meeting. The summary for the 4 initial 2017 plans are:

1-2017 Babcock Improvements Shared Lane featuring Two way Motor Vehicle, Shared Lane Bike Travel with Pedestrian Refuge Islands and Parking

- Motor vehicle travel lanes are 10.5 feet in each direction and the two way directionality of Babcock Street is maintain
- North of the Fire Station Bicycle travel is a shared lane conditions with Sharrow pavement markings
- Parking is maintained, but alternates sides to create a chicane movement to reduce motor vehicle travel speeds. Parking count is 24 metered parking spaces, 42 2-hour parking spaces, and 2 HP spaces in their current locations
- Pedestrian Refuge islands or curb extensions are used at each existing or new crosswalk north of the Fire Station to reduce motor vehicle travel speeds and increase pedestrian safety at the crossing locations
- Pedestrian actuated Rapid Rectangular Flash Beacons (RRFB) are used at the existing crosswalk between Devotion and Dwight Streets to further protect pedestrians in the crosswalk
- Sidewalks are maintained on both sides of the street

2-2017 Babcock Improvements Two-Way Cycle Track featuring Two way Motor Vehicle, Street Level Cycle Track with Delineator Posts and No Parking

- Motor vehicle travel lanes are 10 feet in each direction and the two way directionality of Babcock Street is maintain (minimum per MassDOT)
- North of the Fire Station Bicycle travel is a street level 8 foot cycle track with a 2 foot painted buffer with seasonal (April to November) delineator posts installed every 40 feet to provide additional separation between the cyclists and motor vehicle traffic
- Parking is largely removed in the non-metered areas, except for the 2 existing HP spaces which are maintain in their current locations with cut-ins. Parking count is 19 metered parking spaces, 0 2-hour parking spaces, and 2 HP spaces
- Pedestrian crosswalks are provided at all cross street locations and the crossing distance when the pedestrian is in conflict with motor vehicles is reduced from 30 feet today to 20 feet
- Pedestrian actuated Rapid Rectangular Flash Beacons (RRFB) are used at the existing crosswalk between Devotion and Dwight Streets to further protect pedestrians in the crosswalk
- Sidewalks are maintained on both sides of the street

3-2017 Babcock Improvements One Way Cycle Track featuring One way Motor Vehicle with two way connections, Raised Two-way Cycle Track and Parking

- One way northbound motor vehicle travel lane in the one way section north of the Fire Station is 11 feet wide.
- Motor vehicle connections for the neighborhoods east and west of Babcock Street are maintained with two way 10 foot wide motor vehicle lanes between Manchester and Freeman and Winslow and Osbourne. Parking is removed in these areas.
- North of the Fire Station Bicycle travel is a raised 3 inch 8 foot cycle track with a 2 foot buffer to provide separation between the cyclists and motor vehicle traffic
- Parking is maintained, except in the two way portions of the roadway. Parking count is 24 metered parking spaces, 33 2-hour parking spaces, and 2 HP spaces in their current locations
- Pedestrian crosswalks are provided at all cross street locations and the crossing distance when the pedestrian is in conflict with motor vehicles is reduced from 30 feet today to 20 feet
- Pedestrian actuated Rapid Rectangular Flash Beacons (RRFB) are used at the existing crosswalk between Devotion and Dwight Streets to further protect pedestrians in the crosswalk
- Sidewalks are maintained on both sides of the street

4-2017 Babcock Improvements Bike Lane featuring Two way Motor Vehicle, Street Level Bike Lanes and No Parking

- Motor vehicle travel lanes are 10 feet in each direction and the two way directionality of Babcock Street is maintain (minimum per MassDOT)
- North of the Fire Station Bicycle travel is a street level 5 foot bike lanes (minimum per MassDOT)
- Parking is largely removed in the non-metered areas, except for the 2 existing HP spaces which are maintain in their current locations with cut-ins. Parking count is 19 metered parking spaces, 0 2-hour parking spaces, and 2 HP spaces
- Pedestrian crosswalks are provided at all cross street locations
- Pedestrian actuated Rapid Rectangular Flash Beacons (RRFB) are used at the existing crosswalk between Devotion and Dwight Streets to further protect pedestrians in the crosswalk
- Sidewalks are maintained on both sides of the street

Based on all of the feedback provided, the Transportation Board requested the following revisions of staff at the November 27th meeting:

1. Contact MassDOT about waivers for minimums
2. Look at raised element at Fire Station driveway since the driveway is already a grade drop experienced by the truck to set the tone for a slower Babcock Street coming out of Coolidge Corner
3. Revise Option Plan # 1:
 - a. Try to use additional techniques to slow down traffic
 - b. Make chicanes using hard curb and not paint
 - c. See about altering traffic patterns around the two parks
4. Revise Plan # 2:
 - a. Show 2A - Extend protected bike lane to John Street & 2B - Extend protected bike lane to Harvard Street
 - b. Add back as much parking as possible with cut-ins on Babcock, both sides of John Street, etc

- c. Look to protect pedestrians as they cross between motor vehicle lane and protected bike lane
 - d. Look to add signage telling Peds & motorists on side streets to look for both ways before crossing protected bike lane
 - e. Look at the spacing and show locations of delineator posts
 - f. Look into year round delineator posts and impact on DPW operations
5. Revise Plan # 3:
- a. Show 3A - Extend protected bike lane to John Street & 3B - Extend protected bike lane to Harvard Street
 - b. Show option with Cycle track raised as you cross side streets
 - c. Look to add signage telling Peds & motorists on side streets to look for both ways before crossing protected bike lane
 - d. Add back as much parking as possible with cut-ins, both sides of John Street, etc
 - e. Look to protect pedestrians as they cross between motor vehicle lane and protected bike lane
 - f. Inquire with BTM to see if this option is viable to one way to Babcock, if not look at alternatives
 - g. Make chicanes using hard curb and not paint
6. Remove Option # 4. Reason is street level bike lanes on both sides with no protection AND a lack of a parking lane would cause them to be blocked and, if unavailable, do not add any degree of safety over existing conditions. Plus no individual, group, or Town Department supported this plan.
7. Create a 5th plan which has 1 way cycle track on Babcock toward Harvard and 1 way cycle track on Naples toward Commonwealth Ave

Based on this, and additional guidance from MassDOT related to design minimums, the City of Boston Transportation Department, and the Town's Tree Warden and Arborist, the Transportation Board had 6 plans before them:

Revised 1-2017 Babcock Improvements Shared Lane featuring Two way Motor Vehicle, Shared Lane Bike Travel with Pedestrian Refuge Islands and Parking

- Motor vehicle travel lanes are 10 feet in each direction and the two way directionality of Babcock Street is maintained
- North of the Fire Station Bicycle travel is a shared lane condition with Sharrow pavement markings with a 2' buffer area between the parked vehicle and the motor vehicle travel lane
- Parking is maintained, but alternates sides to create a chicane movement to reduce motor vehicle travel speeds. Parking count is 24 metered parking spaces, 42 2-hour parking spaces, and 2 HP spaces in their current locations
- Created 18 new metered parking spaces on John Street
- Pedestrian Refuge islands or curb extensions are used at each existing or new crosswalk to reduce motor vehicle travel speeds and increase pedestrian safety at the crossing locations. Chicanes are hard curb instead of paint, where feasible
- Pedestrian actuated Beacons are used at the existing crosswalk between Devotion and Dwight Streets to further protect pedestrians in the crosswalk
- Existing Sidewalk and Tree lawns are maintained on both sides of the street

Assessment of the plan from a complete streets perspective:

- Meets the needs of
 - Motorists with travel lanes in both directions and large number of parking spaces
 - Pedestrians with existing sidewalks and enhanced pedestrian crossings with refuge islands, pedestrian beacons, curb extensions, etc.
 - Includes tree lawns, room for benches, etc.
 - Has traffic calming elements to alter motorist behavior
 - Previously expressed as the preferred alternative for the Brookline Police Department
 - Meets the operational needs of the Department of Public Works and Fire Department as expressed to staff
- Does not meet the needs of
 - Cyclists with the lowest possible type of accommodation of sharrows only which forced them to share the road with motorists in both directions. This will not lead to a travel mode shift and will likely result in some cyclists using the sidewalk.

Option 1-2017 Babcock Street CS Freeman and Dwight Alternate Traffic Pattern

- Based on sketches from the proponent, Jacob Munier, staff created a plan which disrupts the flow of southbound traffic by making a mandatory left turn onto Freeman/Dwight and then a right turn around the park, and then a left turn back onto Babcock Street

Staff made the recommendation on Plan 1 that should the Transportation Board vote to install option 1, staff did not recommend the optional Freeman and Dwight traffic pattern because it was confusing, required additional turns and conflict points between through vehicles with pedestrians and cyclists.

Revised 2-2017 Babcock Improvements Two-Way Cycle Track featuring Two way Motor Vehicle, Sidewalk Level Cycle Track and Minimal On-street Parking (attachment # 1)

- Motor vehicle travel lanes are 9.5 feet in each direction and the two way directionality of Babcock Street is maintain
- North of the John Street Bicycle travel is a 3 inch raised 8 foot cycle track with a 3 foot buffer to provide additional separation between the cyclists and motor vehicle traffic
 - 3 foot buffer will also meet the need of residents to place the barrels for trash pickup since DPW has disclosed that their arms for automated pickup cannot reach further than 9 feet
- Parking is largely removed in the non-metered areas, except for the 2 existing HP spaces which are maintain in their current locations and 3 additional spaces with cut-ins. Parking count is 19 metered parking spaces, 3 2-hour parking spaces, and 2 HP spaces.
- Created 18 new metered parking spaces on John Street
- Pedestrian crosswalks are provided at all cross street locations and the crossing distance when the pedestrian is in conflict with motor vehicles is reduced from 30 feet today to 19 feet. Plus there is a 3 foot buffer area for pedestrians to use to make a 2 stage crossing
- Pedestrian actuated Beacons are used at the existing crosswalk between Devotion and Dwight Streets to further protect pedestrians in the crosswalk
- Existing Sidewalk and Tree lawns are maintained on both sides of the street

Assessment of the plan from a complete streets perspective:

- Meets the needs of
 - Pedestrians with existing sidewalks and enhanced pedestrian crossings with refuge islands and pedestrian beacons
 - Cyclists with a separated 3inch raised cycle track to John Street
 - Includes tree lawns, room for benches, etc.
 - Meets the operational needs of the Department of Public Works and Fire Department as expressed to staff
- Partially meets the needs of
 - Motorists with travel lanes in both directions BUT eliminates almost all of the on-street 2 hour parking.
 - Staff was unable to add more than 3 parking space cut ins based on a walk of the roadway with Tom Brady, Brookline's Tree Warden and Town Arborist, due to the vital root zone of the mature street trees.
- Does not meet the needs of
 - Brookline Police Department which expressed concerns to the Transportation Board in their letter (attachment # 2) about the relocation of parked vehicles on residential side streets and the conflicts this will cause within the neighborhood

Option 2-2017 Babcock Street CS Alternative Two Way Cycle Track to Harvard Street(attachment # 3)

- Continues the sidewalk level cycle track to Harvard Street by removing 8 on-street metered parking spaces.

Staff made the recommendation on Plan 2 that should the Transportation Board vote to install option 2, staff recommended the optional plan because the loss of 8 on-street metered parking spaces on Babcock Street were offset by the creation of 18 new metered parking spaces on John Street.

Revised 3-2017 Babcock Improvements One Way Cycle Track featuring One way Motor Vehicle with two way connections, Raised Two-way Cycle Track and Parking

- One way northbound motor vehicle travel lane in the one way section north of the Fire Station is 11 feet wide.
- Motor vehicle connections for the neighborhoods east and west of Babcock Street are maintained with two way 9 feet wide motor vehicle lanes between Manchester and Freeman and Winslow and Osbourne. Parking is removed in these areas.
- North of the Fire Station Bicycle travel is a raised 3 inch 8 foot cycle track with a 4 foot buffer to provide separation between the cyclists and motor vehicle traffic
- Parking is maintained, except in the two way portions of the roadway. Parking count is 24 metered parking spaces, 34 2-hour parking spaces with one new cut-in, and 2 HP spaces in their current locations
- Created 18 new metered parking spaces on John Street
- Pedestrian crosswalks are provided at all cross street locations and the crossing distance when the pedestrian is in conflict with motor vehicles is reduced from 30 feet today to 11 feet. Plus there is a 3 foot buffer area for pedestrians to use to make a 2 stage crossing
- Pedestrian actuated Beacons are used at the existing crosswalk between Devotion and Dwight Streets to further protect pedestrians in the crosswalk
- Sidewalks are maintained on both sides of the street

Assessment of the plan from a complete streets perspective:

- Meets the needs of
 - Pedestrians with existing sidewalks and enhanced pedestrian crossings with refuge islands and pedestrian beacons
 - Cyclists with a separated 3inch raised cycle track to John Street
 - Includes tree lawns, room for benches, etc.
 - Meets the operational needs of the Department of Public Works and Fire Department as expressed to staff
- Partially meets the needs of
 - Motorists with travel lanes in both directions BUT eliminates almost half of the on-street 2 hour parking.
 - Staff was unable to add more than 3 parking space cut-ins based on a walk of the roadway with Tom Brady, Brookline's Tree Warden and Town Arborist, due to the vital root zone of the mature street trees.
- Does not meet the needs of
 - Brookline Police Department which expressed concerns to the Transportation Board in their letter about the relocation of parked vehicles on residential side streets and the conflicts this will cause within the neighborhood as well as the added delay in emergency response time caused by the one way directionality
 - Boston Transportation Department raised concerns about the effect of the one-way on the operations of the intersection of Commonwealth Avenue at Babcock Street now that Commonwealth Avenue Phase 2A eliminates the left turn at Pleasant Street.

Staff notified the Transportation Board that should they vote to install option 3, it would trigger Massachusetts General Law Chapter 82, Section 1 which would require the positive vote of the Select Board and the approval of Mayor Walsh since the plan eliminates access to the roadway within 500 yards of the municipal border. Given that the Boston Transportation Department voiced concerns over this, staff doubted that Mayor Walsh would grant permission and therefore the Town would need to appeal his objection to the Secretary of Transportation which was also unlikely to be granted.

New 5-2017 Babcock Improvements featuring Two-way Motor Vehicle, One Way Street Level Bike Lane and On-street Parking

- Motor vehicle travel lanes are 9 feet in each direction and the two way directionality of Babcock Street is maintained
- North of the Fire Station Bicycle travel is a street level 5 foot southbound bike lane and northbound sharrows
- Parking is largely maintained, including the 2 existing HP spaces, in the current locations. Parking count is 19 metered parking spaces, 54 2-hour parking spaces, and 2 HP spaces.
- Created 18 new metered parking spaces on John Street
- Pedestrian crosswalks are provided at all cross street locations and the crossing distance when the pedestrian is in conflict with motor vehicles is reduced from 30 feet today to 18 feet.
- Pedestrian actuated Beacons are used at the existing crosswalk between Devotion and Dwight Streets to further protect pedestrians in the crosswalk
- Existing Sidewalk and Tree lawns are maintained on both sides of the street

Assessment of the plan from a complete streets perspective:

- Meets the needs of
 - Motorists with travel lanes in both directions and parking.
 - Pedestrians with existing sidewalks and pedestrian crossings
 - Includes tree lawns, room for benches, etc.
 - Meets the operational needs of the Brookline Police Department, Department of Public Works and Fire Department as expressed to staff
- Partially meets the needs of
 - Southbound cyclists with dedicated spaces in the form of a 5 foot street level dedicated bicycle lane like many in Town, however safer because it is not next to parked cars or the dangerous door zone
- Does not meet the needs of
 - Northbound cyclists with only a sharrow condition

Option Naples Road Alternate Bicycle Improvement Plan

- Alters the approved Naples Road plan by shifting parking along the even side of the road allowing for a dedicated space in the form of a 5 foot street level northbound bicycle lane to correspond with the southbound bicycle lane on Babcock Street

Staff made the recommendation on Plan 5 that should the Transportation Board vote to install option 5, staff recommended the optional plan because combined they provide the cyclists with a dedicated street level continuous bike lane connecting Harvard Street and Commonwealth Avenue in both directions

New 6-2017 Babcock Improvements featuring Two-way Motor Vehicle, One Way Sidewalk Level Cycle Track and On-street Parking

- Motor vehicle travel lanes are 10 feet in each direction and the two way directionality of Babcock Street is maintained
- North of the Fire Station Bike travel is a sidewalk level cycle track southbound in the existing sidewalk location and northbound sharrow
- Pedestrians on the southbound side are along a new 4 foot sidewalk constructed between the motor vehicle travel lane and existing tree lawn
- Parking is largely maintained, including the 2 existing HP spaces, in the current locations. Parking count is 19 metered parking spaces, 54 2-hour parking spaces, and 2 HP spaces.
- Created 18 new metered parking spaces on John Street
- Pedestrian crosswalks are provided at all cross street locations and the crossing distance when the pedestrian is in conflict with motor vehicles is reduced from 30 feet today to 20 feet.
- Pedestrian actuated Beacons are used at the existing crosswalk between Devotion and Dwight Streets to further protect pedestrians in the crosswalk
- Tree lawns are maintained on both sides of the street, but the southbound side loses 1.5 feet to make the new pedestrian sidewalk

Assessment of the plan from a complete streets perspective:

- Meets the needs of
 - Motorists with travel lanes in both directions and parking.
 - Southbound cyclists with a sidewalk level cycle track
 - Includes tree lawns, room for benches, etc.

- Meets the operational needs of the Brookline Police Department, Department of Public Works and Fire Department as expressed to staff
- Partially meets the needs of
 - Pedestrians with a new 4 foot sidewalk
- Does not meet the needs of
 - Northbound cyclists with only a sharrow condition

Option Naples Road Alternate Bicycle Improvement Plan

- Alters the approved Naples Road plan by shifting parking along the even side of the road allowing for a dedicated space for cyclists in the form of a 5 foot street level northbound bicycle lane to correspond with the southbound cycle track on Babcock Street.

Staff made the recommendation on Plan 6 that should the Transportation Board vote to install option 6, staff recommended the optional plan because combined they provide the cyclists with a dedicated street level continuous bike lane and raised cycle track connecting Harvard Street and Commonwealth Avenue

****An important note about option # 6 was that the Tree Warden expressed concern that the relocation of the curb and the trenching to construct the new sidewalk would compromise the tree roots, causing them to fall within a year, and therefore he would require staff to undergo the public process to remove the public shade trees. This was based on his past experience that mature trees rely on the existence of the granite curb for stability as they grow and when that is altered the pressure is released and there is nothing holding them up in that location. Below is a picture of the result of removal and relocation of a curb with a mature tree from nearby Watertown, MA.**





With everything taken into account staff recommended that the Transportation Board adopt Option # 5 with the Naples Rd Alternative as the compromise plan that best meets the needs of all roadway users. Following a discussion of the Transportation Board a motion was made to adopt the Option # 5 with the Naples Road alternative with the amendment that staff attempt to slow motor vehicle traffic and further protect pedestrians at crossing locations through the installation of curb extensions. The motion passed by a vote of 4 to 2 (Safer, Zelnick, Kapust, Tali in favor and Dempsey, Englander opposed).

The final adopted plan can be seen in attachment # 4 and includes:

Final Approved Babcock Improvements featuring Two-way Motor Vehicle, One Way Street Level Bike Lane and On-street Parking

- Babcock Street South of the Fire Station:
 - Motor vehicle travel lanes are 10 feet in each direction and the two way directionality of Babcock Street is maintained
 - Bicycle travel is a street level buffered bicycle 5 foot southbound bike lane and northbound sharrows
 - Parking is largely including commercial loading zone and 16 metered parking spaces
 - New pedestrian crosswalks at John Street
 - Curb extensions at John Street to increase pedestrian safety and slow motor vehicle traffic as it makes turning movements
 - Existing Sidewalk and Tree lawns are maintained on both sides of the street
- Babcock Street South of the Fire Station:
 - Motor vehicle travel lanes are 9 feet in each direction and the two way directionality of Babcock Street is maintained
 - Bicycle travel is a dedicated street level 5 foot southbound bike lane (toward Harvard) and northbound sharrows
 - Parking is largely maintained, including the 2 existing HP spaces, in the current locations. Parking count is a Commercial Loading Zone, 8 metered parking spaces, 54 2-hour parking spaces, and 2 HP spaces.

- Pedestrian crosswalks are provided at all cross street locations and the crossing distance when the pedestrian is in conflict with motor vehicles is reduced from 30 feet today to 18 feet.
- Pedestrian actuated Beacons are used at the existing crosswalk between Devotion and Dwight Streets to further protect pedestrians in the crosswalk
- Curb extensions to increase pedestrian safety and slow motor vehicle traffic as it makes turning movements
- Existing Sidewalk and Tree lawns are maintained on both sides of the street
- Naples Road:
 - Motor Vehicle travel lanes are 10 feet in each direction and the two way directionality of Naples Road is maintained
 - Bicycle travel is a dedicated street level 5 foot northbound bike lane (toward Commonwealth Ave) and southbound sharrows
 - Parking is maintained, but moved to the even side of the street to allow the dedicated bike lane to be against a curb and not a motor vehicle door zone
 - Intersection of Gibbs and Naples is altered to reduce pavement width, install ADA compliant wheel chair ramps, crosswalks, and an all way STOP control

Assessment of the plan from a complete streets perspective:

- Meets the needs of
 - Motorists with travel lanes in both directions and parking
 - Pedestrians with existing sidewalks and pedestrian crossings
 - Includes curb extensions, all way STOP controls, and pedestrian beacons for increased safety
 - Includes tree lawns, room for benches, etc.
 - Meets the operational needs of the Brookline Police Department, Department of Public Works and Fire Department as expressed to staff
- Partially meets the needs of
 - Cyclists with dedicated space in the form of a 5 foot street level, like many in Town, in both directions connecting Harvard Street and Commonwealth Avenue. While not a raised cycle track, the dedicated space is safer than existing conditions.
 - Design is safer than most on-street bicycle lanes within the Town and Greater Boston region because they are next to the curb and not next to a parked motor vehicle with the dangerous door zone

USE OF NAPLES ROAD

As directed by the Select Board, staff and the Transportation Board ultimately decided to use Naples Road as part of the solution to provide a direct and dedicated bicycle lane accommodation between Harvard Street and Commonwealth Avenue in the form of a 5 foot on-street bicycle lane. This usage was based on the determination of the January 2017 report that demonstrated that based on vehicle speed, vehicle volumes, and a lack of accident history bicycles could travel safely on Naples Road. However, in order to further ensure the safety of the cyclist using this dedicated northbound lane staff recommended, and the Transportation Board voted, to shift the parking supply from the odd side of the street to the even side of the street. This shift allows the cyclist to ride next to the curb instead of next to the parked cars where they are at risk of being 'doored'. 'Car dooring', when a cyclist is struck by the opening of a parked car door is one of the leading causes of injuries for cyclists and has resulted in the death of several cyclists in the Greater Boston area. The shift of this parking supply is needed to

ensure the safety of the northbound cyclist and is being achieved without any impact on the supply for the residents of Naples Road.

Additionally, my April 25, 2017 memo to you for the first appeal I stated that

“Following the study and presentation of the Naples Road alternative designs the Bicycle Advisory Committee, bicycle advocates, and the Transportation Board concluded that Naples Road was not a reasonable alternative for cyclists because it would put them 3 blocks out of their way from their desired path of travel, could not provide separate facilities and included shared lane markings in at least one direction, required an uphill movement to travel south/westbound, and lacked a safe transition onto Harvard Street. All parties believed that the Naples Road design should be advanced on its own merit, but not as a reasonable alternative to safe and accessible bicycle accommodations on Babcock Street.”

Some of the appellants are attempting to argue that this conclusion equals staff's view that Naples Road should not be part of the solution of this project; however that is an incorrect conclusion.

The intent of this paragraph was to inform you that, at the time, staff had examined if Naples Road could not be used as a substitute to providing any bicycle accommodations on Babcock Street. Because there is no direct connection from Commonwealth Avenue westbound to Naples Road and the previously outlined concerns about bicycle access to Harvard Street southbound via Naples Road, we concluded that it was not a substitute. However, Option # 5 does use Naples Road as part of a complete solution to provide dedicated bicycle lanes between Harvard Street to Commonwealth Avenue. Babcock Street, which has a direct connection from Commonwealth Avenue westbound, provides a southbound bicycle lane to Harvard Street and Naples Road provides a northbound bicycle lane to Commonwealth Avenue. By using a 2 street solution we are able to better provide access for all mode users and reduce the negative impacts that a one street solution would have on other travel mode users.

WHY NOT OPTION # 2?

I will allow the Transportation Board members to voice their collective reasons on why they chose Option # 5 over option # 2, but I will provide you with the reasoning why staff made that recommendation. Trust me when I say that no one in the Town wanted to be able to advance a separated, two way cycle track on Babcock Street more than staff. However, in the end, we had to abandon our support for the plan because of the loss of almost all on-street, residential parking north of the Fire Station.

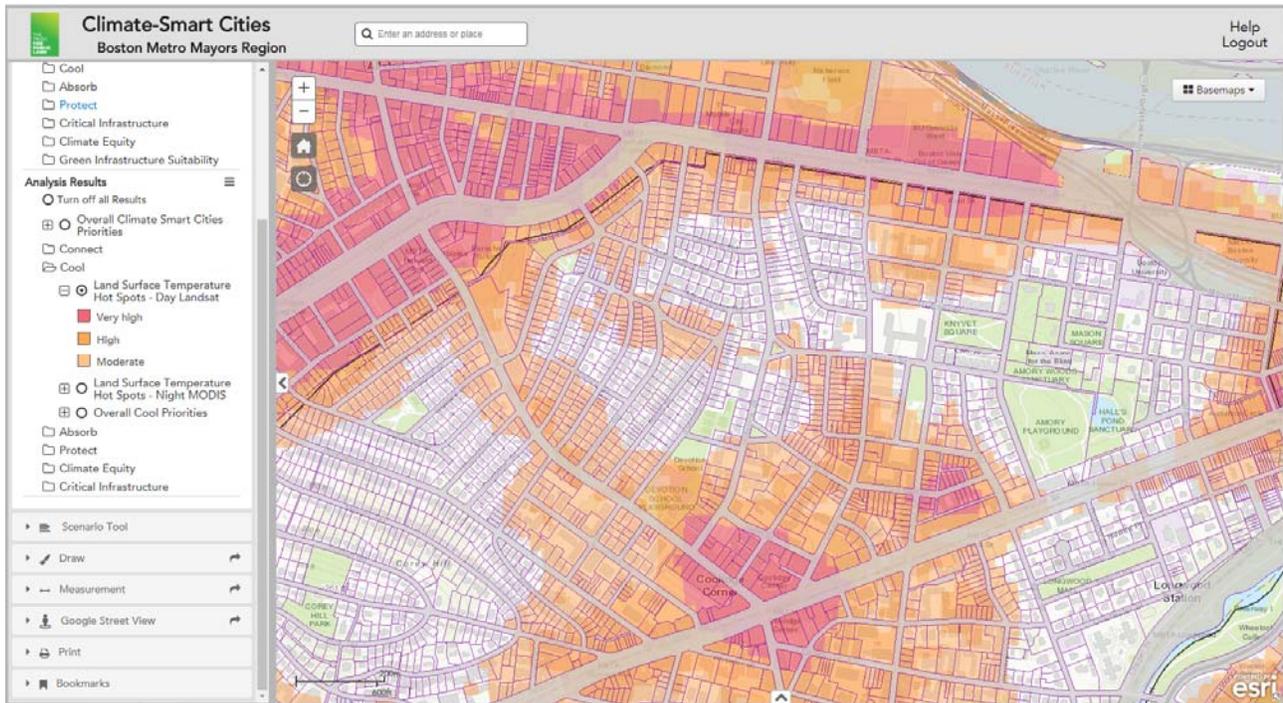
Early on in the process it is was evident to staff that any plan that called for the wholesale or a large proportion of removal of parking spaces on Babcock Street, regardless of the ability of the adjacent side streets to meet the demand, was a non-starter. This was based on the vast majority of comments received in the first public hearing in June 2015, comments received during the Staff Appointed Working Group meetings, initial meetings between staff and some Town Meeting members, comments received during the first Transportation Board process, comments expressed at the Select Board Appeal meeting, the Select Board decision, comments made at the November public meetings, and finally the many emails staff and the Transportation Board received. Therefore any final plan, in order to withstand an appeal to the Select Board, was seen as needing to retain adequate on-street parking on Babcock Street north of the Fire Station.

As stated above, following the November 27, 2017 meeting of the Transportation Board, the strong desire by the Board and staff was to advance Option # 2 by creating additional cut-ins, similar to the 2 created for the existing handicap parking spaces, to provide an adequate number of on-street parking in each block to meet the parking needs of the users of the public parking

supply. However, because of the legal protections of the public shade trees and the importance of mature trees to our environment, the direction was to only consider spaces which did not require their removal. Cut in parking spaces require 20 feet with an additional 12 feet of transitional curb (6 feet in the beginning and 6 feet in the end). Therefore the minimum required length is 32 feet for 1 space, 52 feet for 2 spaces, 72 feet for 3 spaces, etc. Based on the locations of the streets trees on our survey data staff created an initial plan that would have allowed for the creation of 20 additional parking spaces.

However, since Transportation Division staff is not experts on trees, we consulted with Tom Brady, the Town's Arborist and Tree Warden to review the plan in the field. As we explained to the Transportation Board during the January 22nd meeting, what we learned was that because of the 'critical route zone', which spreads further than the trunk of the tree, we were unable to add many of the cut-ins and in the end we could only add 3 additional parking spaces. In general, the critical root zone of a tree is equal to the diameter of the tree's trunk but made into feet. Therefore if the tree has a trunk diameter of 20 inches, the critical root zone is a diameter of 20 feet. In order for the tree not to be structurally compromised at least 50% of the critical root zone must not be cut or dug into. Now it should be noted that Mother Nature does not always follow the standard path so the directionality of the roots, especially those in public shade trees against a curb, spread in other directions and this can be determined by the tree canopy. Attachment # 5 is a map of Babcock Street which shows the critical root zone of each tree and the location of allowable parking cut-ins, as observed during the field walk by the Town's Tree Arborist and Transportation Division engineers. As the Board can see, based on a combination of critical root zones and driveways we are unable to achieve an adequate on-street parking supply.

Of course, the discussion did not stop there. Some people have inquired into whether or not we could remove the larger, mature trees and replace them with parking cut-ins and new street trees which have a smaller tree trunk and critical root zone. While this may be possible, it would come at a cost to the Town's on-going ability to combat climate change. For the past several years staff from all departments have been part of a joint effort to implement strategies to combat climate change and improve the sustainability of the Town. While the creation of bicycle facilities, like cycle tracks, which promote mode shift away from single vehicle occupancy over time, is one important part of this strategy so is the maintenance and growth of our urban forest. As the Board is aware trees in urban areas provide a number of important benefits. They help to clean the air, curb storm water runoff, raise property values, sequester carbon, and reduce energy costs. The more mature the tree, the greater the benefit. As the below Climate Smart Cities map for Land Surface temperatures shows, because of the mature public shade trees on the majority of the portion of Babcock street that we are looking at, the street does not experience any land temperature hot spots. Those areas experiencing High or Moderate hot spots are locations where the smaller diameter street trees are.



Based on this the removal of the mature streets trees were not considered by staff and the failure to create adequate parking for Option # 2 by creating enough cut-ins meant that staff did not believe Option # 2 could be advanced and withstand an appeal to the Select Board. I can only assume that the Transportation Board had the same opinion and that is why they voted to approve Option # 5.

OPTION # 5 RELATIVE TO THE COMPLETE STREETS POLICY

Some have argued that because Option # 5 does not provide a raised, separated cycle track it does not meet the requirements of the Select Board's adopted Complete Streets Policy. The written comments that I have seen on this issue tend to grab one or two lines from the 7 page policy to attempt to show non-compliance. However if one reviews the policy as a whole staff believes that Option # 5 and the process leading to it has met the requirements of the Complete Streets Policy and there was no need for an exemption vote by the Transportation Board.

Section 1 of the Policy, titled "Complete Streets Objectives" is largely seen as the mission statement and end goal. The first paragraph reads:

"The Town of Brookline shall plan, construct, and maintain its public ways to enhance safety, access, inclusion, convenience, and comfort for all users, thereby creating "complete streets." The Town will create a comprehensive transportation network that sufficiently accommodates people of all ages and abilities, whether traveling by foot, bicycle, wheelchair, mass transit, or motor vehicle. Achieving these objectives will require context-sensitive treatments and operational strategies to balance the needs of all users."

This mission statement and goal envisions a network of streets, not a single street or all streets, throughout the Town that provides improved safety and access for all modes while maintaining context sensitive designs and a balance of all users. As stated in our above summary Option # 5 strikes a balance for all users by improving the safety of pedestrians and cyclists on Babcock Street and Naples Road as compared to existing conditions without negatively impacting (to a

large extent) the access of motor vehicles (including their need for on-street parking). Furthermore the design is context sensitive in that it looked at the street as whole, including the effect on the street trees, parking, curbs, etc. and examined it from a network perspective, including Babcock Street and Naples Road, as part of one solution.

The second paragraph of the Policy states that:

".....the Town's transportation projects shall be designed and implemented to provide safe and comfortable access for healthful transportation choices such as walking, bicycling, and mass transit. The needs and safety of the town's most vulnerable users shall be given special consideration during project planning. Users may be considered vulnerable by virtue of their mode of transportation, such as bicycling or walking, or because of their age or ability, such as small children, senior citizens, and people with disabilities."

In staff's opinion Option # 5 clearly improves the "healthful transportation choices" of pedestrians and cyclists as compared to the existing conditions on Babcock Street and Naples Road. Furthermore the 3 year public process for a redesign of Babcock Street has provided consideration for the "needs and safety of the town's most vulnerable users".

The last part of the first section of the Complete Streets Policy states that:

"Brookline's transportation network will maintain or enhance the town's core strengths and values:

- *Convenient, inclusive and safe access by people of all ages and abilities, to all community destinations and activities, via all forms of transportation;*
- *Walkable neighborhoods, commercial districts, and neighborhood school districts;*
- *A network of open spaces, beautiful public spaces, and streets that incorporate trees, vegetation, and art, encourage social engagement, are pleasant to move about and be in, and contribute to a healthy environment;*
- *Economic vitality of local businesses;*
- *Environmental sustainability and transportation choices that reduce carbon emissions and other adverse environmental and public health impacts;*
- *Active, healthy lifestyles; and*
- *Social equity."*

Although Option # 5 does not provide the preferred treatment in every case for all roadway users, it does provide safer access for all modes (pedestrians, cyclists, motorists), it encourages walkable community with new crosswalks, preserves the mature street trees, retains the metered parking supply which has been identified as necessary by the Chamber of Commerce, provides dedicated space in both northbound and southbound directions for cyclists, and enhanced pedestrian accommodations.

The 2nd section of the Complete Streets Policy is titled "Projects and Phases" and the first paragraph, most relevant to this situation, states:

"To provide appropriate accommodation and promote safe travel for users of all ages and abilities, including those who walk, use a wheelchair, bicycle, and use public transit, the Town shall incorporate Complete Streets elements into planning, transportation projects, and other projects affecting the public rights of way and, where feasible, when modifying existing streets, including repaving, painting new pavement markings, refinishing, resetting curbs, and reconstructing sidewalks. Complete Streets

elements are design features that facilitate achievement of the Complete Streets objectives. Safe accommodation for all users should be provided within comprehensive, connected, direct, and low-stress networks in a manner supportive of the surrounding community and in accordance with Brookline's public space constraints, and core strengths and values listed above."

Option # 5, and the public process leading up to it does provide "appropriate accommodation and safe travel for users" of the public way and includes complete street design elements including bike lanes, curb extensions, crosswalks, pedestrian actuated beacons, narrowed travel lanes, pavement markings, street trees, etc. to achieve the values listed in section # 1. While some would argue that failing to provide accommodations on every street does not meet the policy, time and time again the policy talks about the creation of a transportation network of many streets to meet these needs and option # 5 utilizes both Babcock Street and Naples Road to provide safer connections between Harvard Street and Commonwealth Avenue. While there may be gaps in the connections today, staff does not believe that the Policy was ever intended or envisioned that all gaps would be addressed and fixed all at once. The Town has neither the budget nor the manpower necessary to create complete streets throughout the entire Town in one fell swoop. Instead staff believes that the Policy envisioned a deliberative, project by project process to build the network over time. That being said option # 5 is still an improvement compared to existing conditions.

Section # 3, titled "Design Guidance, Flexibility, and Context Sensitivity" is probably the most relevant to the design of Complete Street projects because it includes specific design elements and goals to achieve with projects. Option # 5, and the process leading to it, meets these relevant goals including:

"B. The safety, comfort, and convenience of vulnerable users must be fully considered.

C. Continuous sidewalks shall be provided on both sides of a roadway where possible.

D. New and reconstructed sidewalks shall be accessible to and usable by people with disabilities in accordance with the Americans with Disabilities Act, Massachusetts Architectural Access Board Rules and Regulations (521 CMR), and other applicable accessibility standards. For new and reconstructed sidewalks, obstacles that limit or preclude compliance with said standards, including utility poles, mailboxes, and landscaping, shall be modified, relocated, removed, or worked around to achieve compliance wherever feasible.

E. Sidewalks and crosswalks should be adequately lit.

F. The safety, comfort, and convenience of people crossing streets must be addressed through design considerations such as appropriate location and spacing of crossings, visibility, crossing distances, wait times, conflict reduction, and features that increase the awareness of people traveling through a pedestrian crossing.

G. The safety, comfort, and convenience of people bicycling or walking must be considered and, where appropriate and possible, provided for through separation of disparate types of users. Separated bicycle facilities include, for example, physically-separated bicycle lanes ("cycle tracks"), buffered and conventional bicycle lanes, contraflow travel, bicycle boxes, and dedicated signals. Pedestrian facilities can be separated from bicycles and motor vehicles using tree lawns, street furniture, planters, crosswalk stanchions, bollards, crossing islands, and changes in elevation. The volume and speed of traffic must be considered in determining the needed degree of separation, if any.

M. For transportation and other projects affecting the public way, the Town shall strive to incorporate green infrastructure such as trees, bio-swales, rain gardens, other landscaping and permeable surfaces, wherever applicable and practical, to naturally manage storm water, improve watershed health, reduce heat island effects, and beautify Brookline's streets and public spaces".

Finally the last paragraph of section # 3 states that

"In planning and implementing street projects, all departments and agencies of the Town of Brookline will maintain sensitivity to local conditions in both residential and business districts. They will seek to work with residents, shopkeepers, institutions, and other stakeholders to solicit input on project design, ensure that a strong sense of place is maintained, cultivate a sense of inclusion, and maximize benefit to the community. It will be important to the success of the Complete Streets Policy to ensure that the project development process includes early consideration of land use and transportation context and connectivity, identifies gaps or deficiencies in the network for various user groups, and assesses the trade-offs required to balance the needs of all users."

Once again Option # 5 and the planning process leading to it was a 3 year process that included 5 Transportation Board meetings, 2 Transportation Board public hearings, 3 Staff Appointed Working Group meetings, 2 Select Board meetings (including this one), 3+ Bicycle and Pedestrian Advisory Committee meetings, over 700 pages of emails submitted, and numerous staff letters and advisory memos all of which was done with the goal of meeting the above criteria.

OPTION # 5 RELATIVE TO THE MOTION OF THE SELECT BOARD

As the Board is aware the Transportation Board's enabling legislation provides it the authority to "...adopt, alter or repeal rules and regulations, not inconsistent with general law as modified by this act, relative to pedestrian movement, vehicular and bicycle traffic in the streets and in the town-controlled public off-street parking areas in the town.." but it requires that it do so in a manner that is "...generally consistent with the transportation policies of the Select Board.." Your motion in overturning the decision of the Transportation Board and remanding the Babcock Street redesign back to the Board during the first appeal provided specific "policy direction" to the Transportation Board to follow. Both staff and the Transportation Board took careful steps to ensure compliance with this decision especially the following:

- Consider the implications to fire and emergency medical services and to the impacts on fire department apparatus and personnel, whose location on Babcock Street subject it to continual travel over the area.
- Consider the Town's Complete Streets Policy, but also whether exceptions to some aspects of the policy are appropriate under the circumstances.
- Consider the impacts on existing parking, but do not take the loss of some parking spaces off the table in order to help facilitate an improved plan.
- Protect existing handicap parking along Babcock Street.
- Consider bicycle and pedestrian accommodations including possible alternative bicycle routes adjacent to Babcock Street (e.g. Naples Road).

This "policy direction" is on par with the Complete Streets Policy, adopted by a vote of the Select Board, with one not being any more important from a legal standpoint than the other. Even if the viewpoint of the appellants carried weight in that the Transportation Board did not follow the Complete Streets Policy because it used a 2 street, networked solution; by incorporating the use of both Babcock Street and Naples Road staff and the Transportation Board

were following the direct policy directions of the Select Board when it came to this specific project and based on this fact alone should have the approved plan upheld.

CONCLUSION

Since June 2015 the Transportation Board has engaged Town staff, residents, merchants, advocates, Town Meeting Members, and other interested parties in the very public process to develop a new design for Babcock Street. Half way through that process the Select Board adopted a Complete Streets Policy and the Transportation Board and staff have utilized that policy, as well as other guiding documents, to develop a plan that provides safer accommodations for all users of the public way. In accordance with both the Complete Streets policy and the 2017 policy directive from the Select Board, the Transportation Board approved Option # 5 as the best alternative design which improves pedestrian accommodations on Babcock Street and Naples Road, maintains two way directionality and parking on Babcock Street and Naples Road, and provides for safer and direct bicycle access between Harvard Street and Commonwealth Avenue utilizing a 2 street approach. While this process has been going on the roadway condition of Babcock Street has continued to deteriorate at a fast pace and the roadway is severely in need of reconstruction as the current condition is posing it's own safety concern for roadway users. Based on all of these factors staff requests that you uphold the Transportation Board decision so that we can begin to reconstruct the roadway this construction season.

*Attachments: 1) Revised 2-2017 Babcock Improvements Two-Way Cycle Track
2) Brookline Police Department Letter
3) Option 2-2017 Babcock Street CS Alternative Two Way Cycle Track to Harvard St
4) Approved Option # 5 with Naples Road
5) Critical Root Zone*