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MEMORANDUM FOR THE RECORD

DATE: September 17, 2010
TO: Douglas Greenfeld, AICP, PP – Jersey City HEDC
COPY: GF: E6X71200
FROM: Scott Parker, PE
SUBJECT: **Components of the Boulevard in the Central Section
(Danforth Avenue to Communipaw Avenue)
232-ft, 198-ft and 166-ft Alternatives**

Following is an assessment of the 232-foot wide boulevard concept with respect to meeting the established objectives for the Route 440 / Routes 1&9T Multi-Use Urban Boulevard

I. JERSEY CITY TRANSPORTATION SYSTEM – SUMMARY AND FUTURE VISION

The linkage between transportation and land use is a critical component in the creation and maintenance of communities and economic centers. In years past, transportation infrastructure was viewed in a utilitarian manner as a means to an end...getting people and goods from one place to another...with minimal regard for the context within which that infrastructure existed. In the late 1990's and early 2000's, planning efforts began to seriously recognize the interaction and effect land use and transportation have upon each other. Sustainability became a key philosophy in the planning of transportation infrastructure. The current phase of this evolution centers upon using transportation to not only support the mobility needs of the surrounding and adjacent land uses, but as a cornerstone to the creation of livable communities.

A livable community is one in which all of the diverse mobility needs...both transportation and recreational... of the populations that reside in, work in or visit a community are met in a safe, attractive manner, offering a variety of options in modes of transportation. Today's livable communities are transit-rich, integrating pedestrian and bicycle facilities with roadway, bus and rail opportunities. The Route 440/Routes 1&9T Urban Boulevard is envisioned to be just such a corridor, supporting not only significant growth in the surrounding land uses, but an overall change in the type of land uses to be created, as well as how these uses and destinations are accessed.

As articulated in the Circulation Element of the Jersey City Master Plan, a variety of transportation modes will play a role in the future vision of Jersey City.

“...the City will be served by a multi-modal transportation system that is attractive, clean, safe, efficient, reliable, inclusive, affordable, accessible, and user-friendly. Jersey City’s comprehensive and seamless transportation network will provide options to its users and accommodate all types of trips - both local and regional in nature - to, from, and within all neighborhoods, throughout the day and night, and it will mitigate congestion and minimize the amount of single-occupancy vehicular traffic in Jersey City.”

“The City’s transportation network will benefit residents, workers, and visitors alike by giving people a choice in how they travel to, from, and within Jersey City. The principal features of Jersey City’s transportation network will be a highly-functioning and efficient multi-modal public transit system, a roadway network that will not only accommodate vehicular traffic but will also provide safe and efficient accommodation for bicyclists and pedestrians, and a network of off-road bicycle and pedestrian paths that complement the City’s parks and open spaces.”

The redevelopment vision for the western waterfront of Jersey City is based upon the following principles:

- ***Facilitate, support, and encourage mixed-use pedestrian friendly development*** with a blend of residential, retail, commercial and recreational uses.
- ***Create an interconnected network of streets*** that extends the local “grid” along and across Route 440/Routes 1&9T, and incorporates Route 440/Routes 1&9T as a walkable and bicycle friendly urban boulevard.
- ***Create a bicycle-friendly, walkable community*** by designing the interconnected network of streets as “complete streets” that accommodate the needs of all users with sidewalks, crosswalks, and bicycle lanes, as well as public amenities such as benches, lighting, and way-finding signs.
- ***Create a multi-modal, mass transit-rich environment*** through extension of the Hudson-Bergen Light Rail from its current terminus at the Westside Avenue station and expansion of local and regional bus service.
- ***Increase parks and open space*** within the western waterfront area of Jersey City, particularly along the riverfront, and provide enhanced accessibility to existing and new open space including a new riverfront walkway and pocket parks.

II. ANTICIPATED GROWTH THROUGH 2050

As set forth in the Circulation Element of the Jersey City Master Plan, significant growth and redevelopment is encouraged and anticipated throughout the city. By the year 2050, this long-range vision anticipates the creation of:

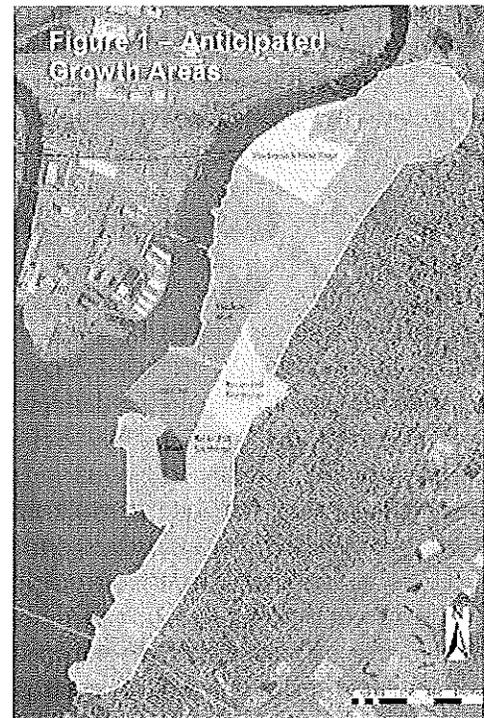
- 80,000± Residential Units
- 10± Million Square Feet Commercial
- Expand open space, bicycle and pedestrian facilities
- Expand mass transit infrastructure and services

A significant portion of this growth is anticipated to occur within the western waterfront of Jersey City along the section of Route 440 between Communipaw Avenue and Danforth Avenue (Figure 1). This western waterfront growth is envisioned to include:

- 19,000± residential Units
- 2± million square feet commercial/retail
- 900,000± square feet commercial warehouse
- Waterfront Walkway, Parks and Open Space
- HBLRT Network and Service Expansion

This section of the Route 440 / Routes 1&9T corridor, referred to in this study as the central section, will see the creation of significant development density, coupled with a new transit center and the integration of extensive public transit opportunities. The buildings that front the sidewalk along the boulevard will likely house active ground-floor retail and restaurant uses with office or residential space above. This level of development and economic growth can only be sustained if dependence on the single occupant vehicle (i.e.: automobiles) is reduced through the provision of public transit opportunities and facilities that encourage bicycle and walking as primary modes of travel for local circulation. In addition, creation of a wide boulevard incorporating all bike lanes, wide sidewalks and significant landscaping will serve to mitigate traffic noise for those who live/work in those spaces.

Designing the boulevard for a posted 30 mph speed limit will significantly alter the character of the corridor, aiding in its conversion from a traditional highway to an urban boulevard. This change will serve to make the corridor even more attractive and inviting to bicyclists and pedestrians, requiring the incorporation of spacious bike paths and sidewalks along and across the corridor. The boulevard cross-sections being advanced are described below, along with the rationale for each component of the boulevard design.



III. OBJECTIVES BY MODE FOR THE MULTI-MODAL BOULEVARD

As summarized above, the over-arching goal of the Jersey City growth vision is to stimulate and accommodate extensive growth while mitigating congestion and reducing the use of the single occupancy vehicles (SOV) in Jersey City. Achievement of this principle is to be advanced in the planning and design of the City's transportation infrastructure, including the development of the Route 440/Routes 1&9T Multi-Use Urban Boulevard. The Urban Boulevard will incorporate and integrate the following modes and objectives:

1. Through Roadways

- To serve through traffic, including trucks if necessary, traveling through the area with neither an origin nor destination within the western waterfront area.
- To maintain mobility and segregate them from local traffic to the extent possible
- To mitigate the adverse impacts of truck traffic (noise, vibration, emissions), on the quality of life within the community.

2. Land Service Roadways

- To provide low speed travel ways for local neighborhood access
- To provide on-street parking to serve short-term parking needs.

3. Frequent Cross Streets

- To ensure connectivity across the boulevard for pedestrians, bicycles and motorists.
- To ensure bicycle and pedestrian access to a future HBLR station on to the west of the boulevard.

4. Sidewalks and Pedestrian Pathways

- To reduce dependency on motor vehicles
- To provide pedestrian accommodation along and across the boulevard.
- To provide pedestrian access to building entrances along both sides of the boulevard.
- To provide pedestrian access to existing and future neighborhoods along both sides of the boulevard
- To provide a recreational amenity for pedestrians
- To provide pedestrian access to public spaces
- To provide space for pedestrian amenities such as sidewalk cafés, kiosks, benches, street trees, etc.
- To provide an attractive and safe environment for pedestrians.
- To provide pedestrian access to a new HBLR and bus station to the west of the boulevard.

5. Bicycle Lanes and Paths

- To reduce dependency on motor vehicles
- To provide bicycle accommodation along and across the boulevard.
- To provide many access points to a future city bike lane network.
- To provide bicycle access to building entrances along both sides of the boulevard.
- To provide bicycle access to existing and future neighborhoods along both sides of the boulevard.

- To provide a recreational amenity for bicyclists
- To provide bicycle access to public spaces.
- To provide bicycle access to a new HBLR and bus station to the west of the boulevard.

6. HBLR Extension and Access

- To reduce dependency on the automobile
- To provide a grade separated crossing of the boulevard by a HBLR extension that is identified in the Jersey City Master Plan.

7. Bus Rapid Transit (BRT) Service

- To reduce dependency on the automobile
- To provide a high capacity, lower cost, rapid public transit service that makes infrequent stops and that provides service between neighborhoods along the boulevard and the Journal Square transportation center.

8. Local Bus and Jitney Service

- To reduce dependency on the automobile
- To provide frequent, flexible, low cost local service connecting residential centers with retail, employment and regional transportation centers along and near the boulevard.

9. Through Roadways

- Significant volumes of through trips, including truck trips, are projected to utilize the corridor in the future. The total volume anticipated under full development (year 2050) required three travel lanes in each direction to accommodate through travel. The 2050 travel projections anticipate the creation of a new transit center within the Bayfront development west of Route 440, extension of the HBLR from its current terminus at West Side Avenue westward across Route 440 proximate to Culver Avenue, incorporation of Bus rapid Transit (BRT) service along the corridor, and expansion of local bus service. These public transit system expansions and additions will serve to reduce dependence on single occupant vehicles. Without these public transit improvements, additional travel lanes would be required to accommodate through and local travel demand along the corridor. Typical highway travel lanes are constructed to a 12-foot width. However, wider lanes encourage higher travel speeds. In the interest of encouraging slower travel speeds (posting at 30 mph), the lanes width was reduced to 11 feet, which is quite typical, especially in urban environments.
- To maintain mobility and segregate them from local traffic to the extent possible
- To mitigate the adverse impacts of truck traffic (noise, vibration, emissions), on the quality of life within the community.

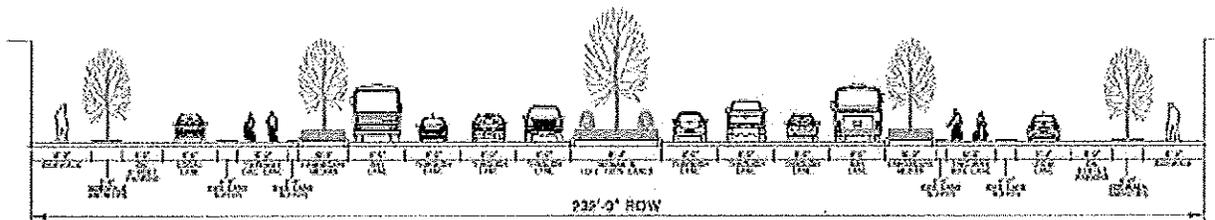
IV. 232-FOOT BOULEVARD ALTERNATIVE

A wide range of boulevard cross section concepts were considered as part of the study process. The boulevard cross section developed as part of the Bayside Visioning Plan incorporated all of the elements described above, with a total width between building faces of 272 feet. The concept development process in the current study took a fresh look at the question of defining the appropriate components and dimensions of the boulevard to meet the objectives articulated above and began with an assembly of all of the desired components at dimensions deemed appropriate based upon a combination of minimum design requirements (i.e.: width of travel lanes) as well as the desire to utilize these individual components for further purposes in support of sustainable, livable communities. Following is a description of the alternative that best meets the objectives of a multi-modal boulevard along the central section of the corridor (Route 440 between Danforth Avenue and Communipaw Avenue).

232-Foot Cross Section

The boulevard cross section that best meets the objectives of a multi-modal boulevard along the central section of the corridor totals 232-feet between the future building lines abutting the corridor (Figure 2). This alternative would be constructed centered along the existing Route 440 right of way, with mirror images on both sides of the center line.

Figure 2 – 232 Foot Boulevard Cross Section



Along the center, the boulevard would incorporate an 18-foot wide center median. This median would be landscaped along its length, and would incorporate dedicated left turn lanes at the signalized through cross-street locations. On each side of the center median, the boulevard would include four (4) 11 foot wide through travel lanes. Three of these lanes would accommodate through traffic with the outermost lane reserved for BRT use. Adjacent to the BRT lane would be a 10 foot wide landscaped median. Adjacent to the median, a 16 foot wide section would accommodate a two-directional bicycle path. The first 2 feet would be constructed as a buffer between the landscaped median and the 10 foot wide two-direction bicycle travel lane. The bicycle lane would be abutted on its outer edge by a four (4) foot wide buffer.

Adjacent to the 4 foot wide buffer, an 11 foot wide travel lane would be constructed to accommodate local traffic and provide access to the future land development along the corridor. An eight (8) foot wide on-street parking lane would provide short term parking

servicing the commercial retail uses anticipated to occupy the first floor of the future development.

Between the on-street parking and the building line, 18 feet would be dedicated to a public space serving and supporting the future development. The first 6 feet of this space would be constructed as a landscaped amenity strip, within which signing, street furniture, benches, lighting and artistic features would be placed. The remaining 12 feet would be dedicated to a pedestrian sidewalk.

Complete Streets and the Boulevard Components

As depicted in the cross sections above (Figure 2), the boulevard may be described as an assembly of all of the desired components necessary to create a "complete street" consistent with the NJDOT's recently adopted Complete Streets Policy. As stated in the NJDOT Mobility and Community Form Transect Flier, this policy is intended as framework within which to:

- Design complete streets and intersections that serve pedestrians, persons with disabilities, bicyclists, transit vehicles and trucks as well as motorists.
- Create interconnected street networks with frequently spaced intersections and networks of pedestrian paths and bicycle trails.
- Provide sufficient-multimodal capacity

The boulevard has been designed in keeping with this policy, with the boulevard centered along the existing NJDOT right of way, with the northbound and southbound sides as mirror images of each other. The individual components are described below.

Major Medians

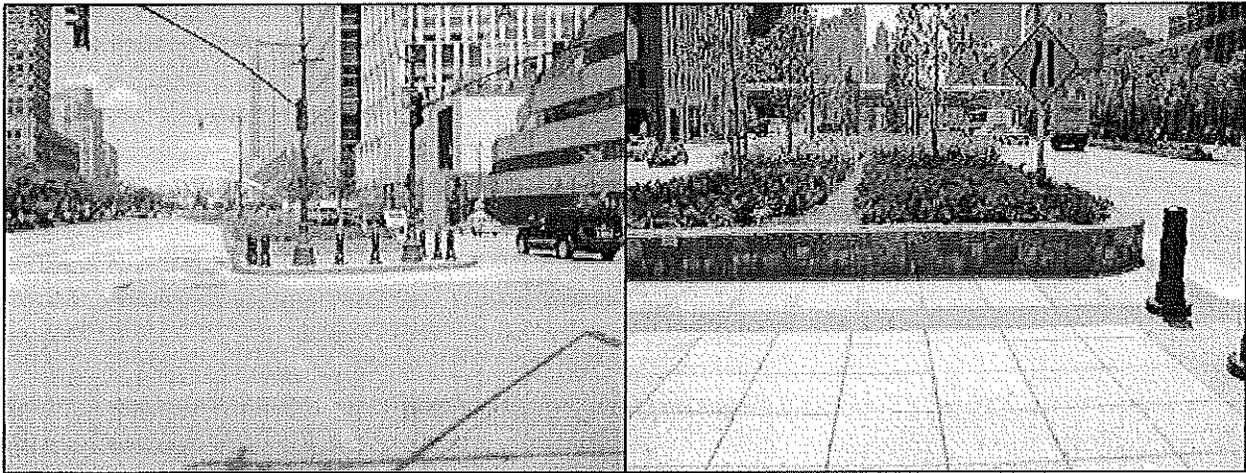
Centered along the existing right of way is an 18-foot wide landscaped median. The median serves several purposes including separation of the northbound and southbound through travel lanes, providing space for integration of periodic dedicated left turn lanes, providing space for pedestrians to stage safely when crossing the boulevard, and offering space for incorporation of significant landscaping.

As stated in the NJDOT Roadway Design Manual, *median widths of 20 feet to 25 feet or more are desirable at intersections with a single left-turn lane, but widths of 15 feet to 18 feet are acceptable.* A median width of 18 feet is considered the absolute minimum along the boulevard due to the significant pedestrian activity that is anticipated in the future, and the desire to encourage walking through provision of safe and attractive pedestrian facilities both along and across the corridor.

As stated above, dedicated left turn lanes will be integrated into the median at the signalized intersections, providing access to the existing and future local adjacent land uses. The NJDOT Roadway Design Manual states that within a median "*left-turn lanes*

with median curbing should be 11 feet wide and desirably 14 feet wide. The lane width is measured from the curb face to the edge of through lane. Left-turn lanes without median curbing should be at least 11 feet wide and preferably 12 feet wide. While minimum 11 foot turn lanes are desirable, in urban settings the use of 10 foot turn lanes is common. Since the cross-streets along the boulevard have significant width (unlike many typical roadways in established urban areas), use of a 10 foot wide left turn lane is felt to be acceptable and appropriate, and will safely and efficiently accommodate turning movements.

With the left turn lanes being 10-feet in width, the remaining 8-feet of median will be utilized as a pedestrian oasis for persons crossing the boulevard who do not make it all the way across in a single movement. This treatment is similar to the treatment within the median area along the West Side Highway as depicted below.



It is important to note in the width of the median in the image below is significantly wider than the width proposed under 232-foot boulevard alternative. The 8-foot wide median pedestrian refuge area along the Route 440 Boulevard would be adjusted to provide adequate pedestrian staging space by extending the area linearly along the median as opposed to widening the median area further than the anticipated 18 feet. Trees and other plant materials are to be planted along the length of the median, contributing to an aesthetically pleasing environment, while serving to buffer existing and future land uses and public spaces from the noise generated by through traffic.

Through Travel Lanes

The number of travel lanes required along the corridor was determined based upon the projection of future vehicle travel demand in the year 2050. Future travel demand was projected to the year 2050, including the development/redevelopment growth anticipated in the Jersey City Master Plan, anticipated growth in the maritime ports in the area (Global Marine terminal, Newark/Elizabeth Seaports, MOTBY), and growth plans being advanced by surrounding municipalities. The forecasts were developed assuming that the future boulevard would include extensive public transit opportunities in addition to the bicycle and pedestrian facilities including an extension of the HBRL westward across

Route 440 from its current terminus at West Side Avenue, integration of Bus Rapid Transit (BRT) along the length of the corridor, and expansion of local bus service. These public transit opportunities will serve to reduce dependence upon the single occupant vehicles in the future. These travel demand forecasts were integrated into a regional roadway network model, with the volume of traffic expected to utilize the Route 440 / Routes 1&9T corridor quantified.

A range of roadway configurations were evaluated to determine the number of travel lanes that would be required to efficiently accommodate this future travel demand along the corridor. Even with the extensive public transit opportunities anticipated in the future, in planning for a worst case condition (i.e.: anticipating that the corridor would continue to be utilized by a significant volume of through traffic including heavy trucks) it was determined that four travel lanes would be required in each direction (three through lanes and one local lane). Accordingly, adjacent to the major median, the 232-foot boulevard configuration incorporates four 11-foot wide travel lanes in each direction. Three of these lanes are for the use of through vehicles, both trucks and automobiles. The fourth and outermost lane is designated as a Bus Rapid Transit (BRT) lane.

As set forth in the NJDOT Roadway Design Manual: *"Lane widths have a great influence on driving safety and comfort. On freeways and land service highways, the predominant lane width is 12 feet. Although lane widths of 12 feet are desirable, there are circumstances on land service highways that necessitate the use of lanes less than 12 feet. In urban areas, the use of 11 foot wide lanes is acceptable. Ten foot wide lanes have been provided in the past at certain locations where right-of-way and existing development became stringent controls and where truck volumes were limited."*

Minor Median

Adjacent to the BRT lanes the 232-foot cross-section incorporates a multi-purpose median. Under both configurations, the median includes a 10-foot wide landscape strip. Along the majority of the corridor, this landscape strip is intended to provide space for significant plantings that will serve to create an attractive environment while buffering the outer portions of the boulevard and future land uses from traffic noise generated by through vehicles. At selected signalized intersection locations where local streets will cross the corridor, BRT stops will be incorporated in place of the planted landscaping. A width of 10-feet is necessary to provide space for a shelter for passengers waiting on a bus, as well as space for bicycle racks and circulation of people when passengers are boarding and departing a BRT vehicle at the curb.

In addition to the aesthetic noise buffering benefits and the provision of space for the placement of BRT station stops, this landscape strip is positioned to provide protection for existing underground utilities and space for the placement of bridge piers supporting the anticipated grade-separated crossing of the Hudson-Bergen Light Rail line across Route 440 in the vicinity of Culver Avenue. Of significant concern is a 36-inch diameter force main that traverses the Route 440 corridor within the area to be occupied by the minor median separating the northbound through and local travel lanes. Placing a

vehicle travel lane above the force main would require significant shielding to protect the utility from damage from vehicles driving over the utility placement.

Bike Paths

Adjacent to the landscape strip, both the 240-foot and the 248-foot cross sections include a 12-foot wide two-directional bike path. This dimension was identified as a minimum requirement to meet not only current design guidance but to adequately serve the objective of encouraging the use of walking and bicycling as part of a livable, sustainable community in keeping with the NJDOT Complete Streets policy.

The following is extracted from the 1999 AASHTO Guide for the Development of Bicycle Facilities.

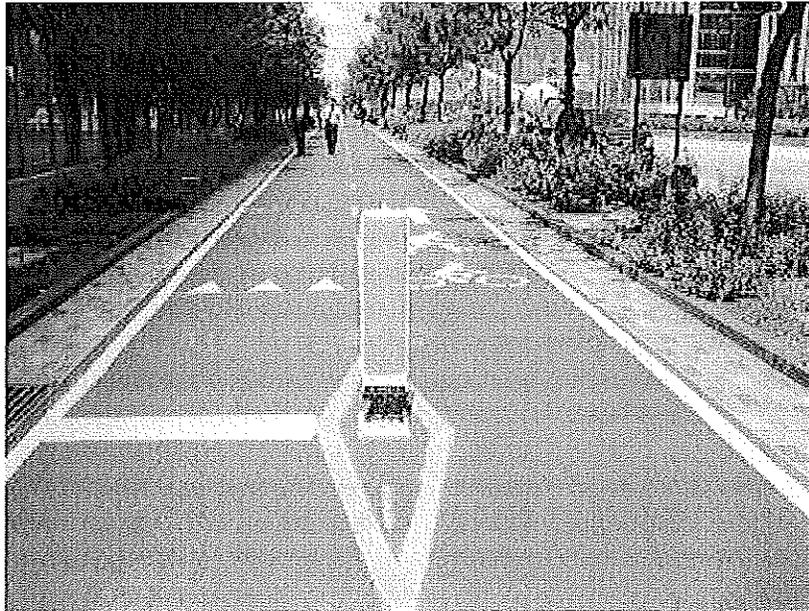
When two-way shared use paths are located immediately adjacent to a roadway, some operational problems are likely to occur. In some cases, paths along highways for short sections are permissible, given an appropriate level of separation between facilities. Some problems with paths located immediately adjacent to roadways are as follows:

1. Unless separated, they require one direction of bicycle traffic to ride against motor vehicle traffic, contrary to normal rules of the road.
2. When the path ends, bicyclists going against traffic will tend to continue to travel on the wrong side of the street. Likewise, bicyclists approaching a shared use path often travel on the wrong side of the street in getting to the path. Wrong-way travel by bicyclists is a major cause of bicycle/automobile crashes and should be discouraged at every opportunity.
3. At intersections, motorists entering or crossing the roadway often will not notice bicyclists approaching from their right, as they are not expecting contra-flow vehicles. Motorists turning to exit the roadway may likewise fail to notice the bicyclist. Even bicyclists coming from the left often go unnoticed, especially when sight distances are limited.
4. Signs posted for roadway users are backwards for contra-flow bike traffic; therefore these cyclists are unable to read the information without stopping and turning around.
5. When the available right-of-way is too narrow to accommodate all highway and shared use path features, it may be prudent to consider a reduction of the existing or proposed widths of the various highway (and bikeway) cross-sectional elements (i.e., lane and shoulder widths, etc.). However, any reduction to less than AASHTO Green Book 1 (or other applicable) design criteria must be supported by a documented engineering analysis.

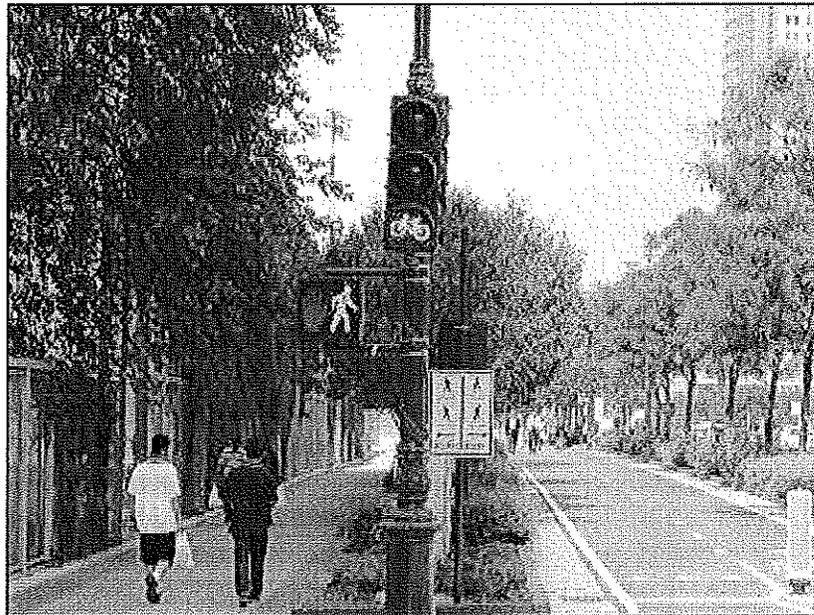
6. Many bicyclists will use the roadway instead of the shared use path because they have found the roadway to be more convenient, better maintained, or safer. Bicyclists using the roadway may be harassed by some motorists who feel that in all cases bicyclists should be on the adjacent path.
7. Although the shared use path should be given the same priority through intersections as the parallel highway, motorists falsely expect bicyclists to stop or yield at all cross-streets and driveways. Efforts to require or encourage bicyclists to yield or stop at each cross-street and driveway are inappropriate and frequently ignored by bicyclists.
8. Stopped cross-street motor vehicle traffic or vehicles exiting side streets or driveways may block the path crossing.
9. Because of the proximity of motor vehicle traffic to opposing bicycle traffic, barriers are often necessary to keep motor vehicles out of shared use paths and bicyclists out of traffic lanes. These barriers can represent an obstruction to bicyclists and motorists,

When two-way shared use paths are located adjacent to a roadway, wide separation between a shared use path and the adjacent highway is desirable to demonstrate to both the bicyclist and the motorist that the path functions as an independent facility for bicyclists and others. **When this is not possible and the distance between the edge of the shoulder and the shared use path is less than 1.5m (5 feet)**, a suitable physical barrier is recommended. Such barriers serve both to prevent path users from making unwanted movements between the path and the highway shoulder and to reinforce the concept that the path is an independent facility. Where used, the barrier should be a minimum of 1.1 m (42 inches) high, to prevent bicyclists from toppling over it. A barrier between a shared use path and adjacent highway should not impair sight distance at intersections, and should be designed to not be a hazard to errant motorists.

The paved width and the operating width required for a shared use path are primary design considerations. Figure 17 depicts a shared use path on a separated right of way. Under most conditions, a recommended paved width for a two-directional shared use path is 3.0 m (10 feet). In rare instances, a reduced width of 2.4m (8 feet) can be adequate. This reduced width should be used only where the following conditions prevail: (1) bicycle traffic is expected to be low, even on peak days or during peak hours, (2) pedestrian use of the facility is not expected to be more than occasional, (3) there will be good horizontal and vertical alignment providing safe and frequent passing opportunities, and (4) during normal maintenance activities the path will not be subjected to maintenance vehicle loading conditions that would cause pavement edge damage. **Under certain conditions it may be necessary or desirable to increase the width of a shared use path to 3.6 m (12 feet), or even 4.2 m (14 feet), due to**



West Side Highway – New York City. This two-directional bicycle facility incorporates 16-feet of paved area in total. The 12-foot wide riding surface is abutted by 2-feet of sloped edge buffer along either side.



Note how even with a sidewalk provided immediately adjacent to the bike path, pedestrians still utilize the bike path as a walking path, detracting from the "ride-able" area for bicyclists.

Local Travel Lane

Adjacent to the minor median/bike lane/buffer, the 232-foot alternative incorporates a single travel lane serving local vehicle circulation and access. As set forth in the NJDOT Roadway Design Manual, while a 12-foot travel lane is considered optimal, 11-foot wide lanes are considered acceptable, particularly in an urban environment. This narrow lane width will adequately accommodate local travel and circulation needs, while encouraging lower travel speeds in support of a friendlier pedestrian environment.

On-Street Parking

Both the 240-foot and the 248-foot alternatives incorporate an 8-foot wide on-street parking lane. Where on-street parking is provided, Jersey City ordinance requires a width of 8 feet. There are numerous benefits to the provision of on-street parking, particularly in light of the anticipated development of significant first-floor retail uses along the boulevard. On-street parking is critical to the urban boulevard for the following reasons:

Safety - On-street parking on low-speed streets (less than 35 mph) has been shown to reduce the severity of vehicular crashes. On-street parking calms traffic by narrowing the perceived width of a roadway, causing drivers to reduce speeds and drive more cautiously. Slower travel speeds allow drivers, pedestrians and bicyclists greater reaction time and reduce the severity of crashes. In fact, the draft concept for the Route 440/Routes 1&9T urban boulevard includes many elements that have been recognized to enhance safety, including a design speed and speed limit of 30 mph, on-street parking, a lack of shoulders, raised curbs, small building setbacks, sidewalks, and vegetated buffer strips.

Vibrant Streets - On-street parking serves as a buffer between moving vehicles and the sidewalk. A lane of on-street parking creates a pedestrian realm that is safer and more comfortable. Not only are sidewalks a space for pedestrians, sidewalks also make up a significant portion of public space in Jersey City. A sidewalk that is buffered by a lane of on-street parking is more attractive to those on foot, as well as to those who are relaxing at a sidewalk café or sitting on a bench located in a dedicated area of the sidewalk.

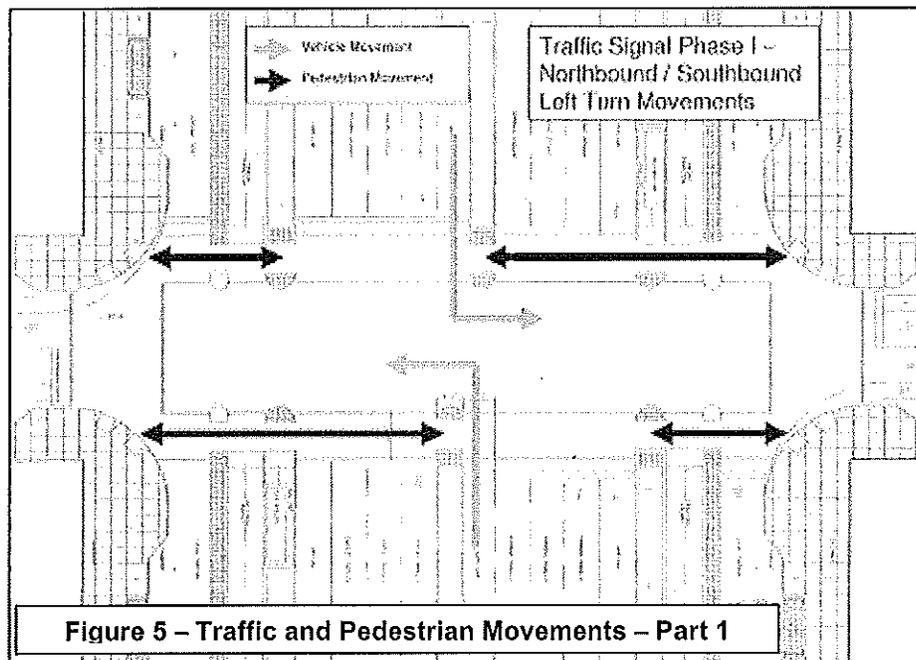
Noise Mitigation - On-street parking mitigates the impacts of the noise of vehicular traffic to pedestrians on the sidewalk and those who live and work adjacent to the corridor. As an urban boulevard, Route 440/Routes 1&9T will continue to be a critical roadway in our street network and will carry a high number of vehicles, including private automobiles, trucks, and buses. The eight-foot wide parking lane on both sides of the boulevard, along with the proposed medians and bicycle paths, will create distance between through traffic and the buildings that abut corridor, thereby reducing noise impacts to the residents and businesses who occupy those buildings. The physical mass of the parked vehicles aids in the noise mitigation by interfering with the sound waves.

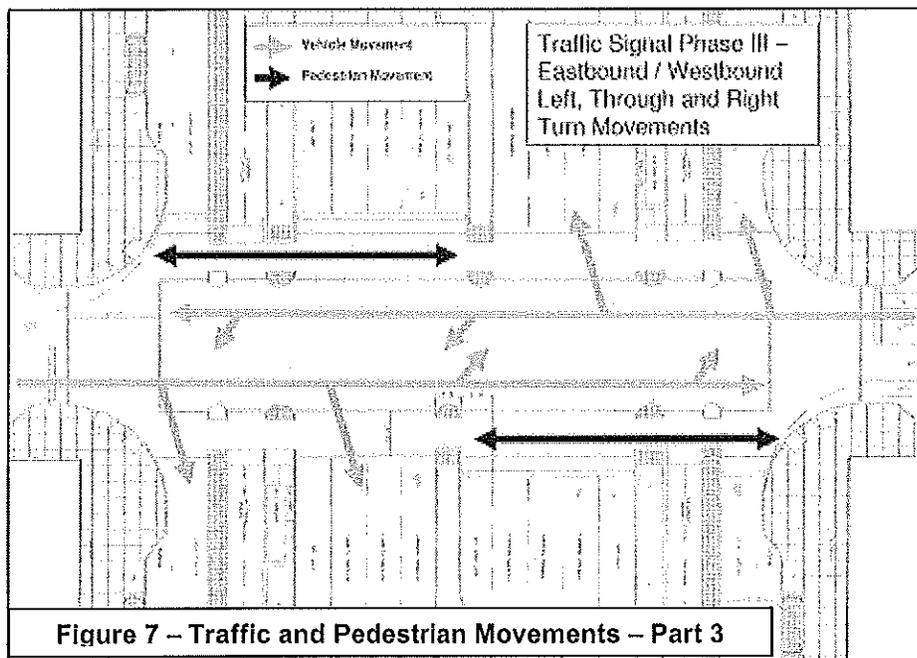
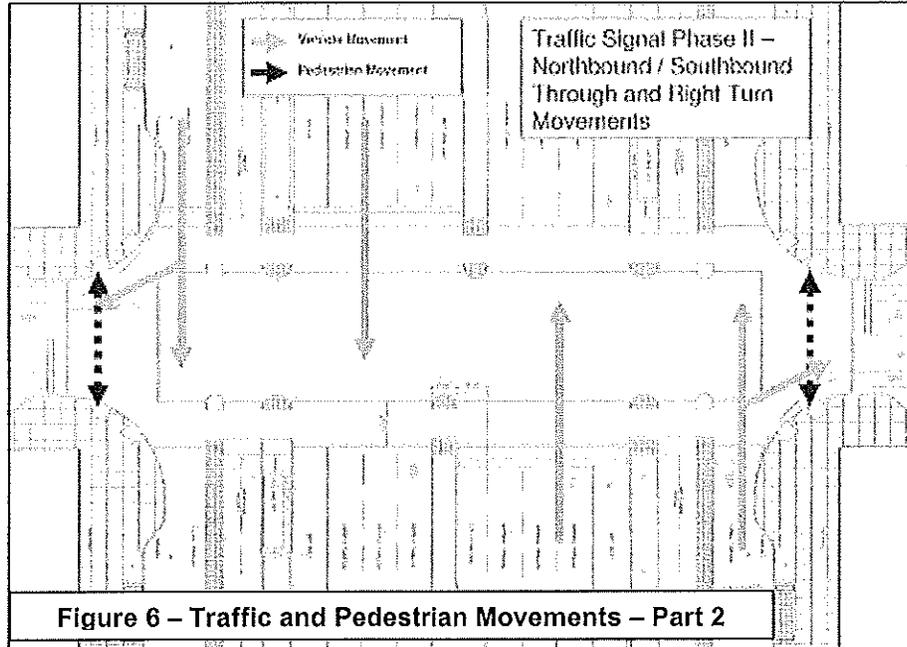
Critical Infrastructure - On-street parking is vital infrastructure for local businesses and residents. It is envisioned that ground-floor retail with frontages on the urban boulevard will be a requirement of the mixed-use redevelopment that will occur over the next 40 years, and the on-street parking will serve the clients of the ground-floor retail establishments.

Pedestrian Movement Across the Boulevard

Pedestrian crossings of the corridor will be restricted to the signal controlled intersections only. The landscaped medians are to be elevated to discourage mid-block pedestrian crossings. Due to the width of the corridor, integration of pedestrian only phases in the traffic signal timing would reduce the green time available for traffic movements to such a degree that traffic efficient traffic operations could not be maintained.

Through careful phasing of the traffic signal timing, pedestrians will have the ability to cross any leg of the intersection while traffic is moving. Figures 5 through 7 depict the phasing of the traffic signals and the movement of pedestrians during each phase of the traffic signal cycle.

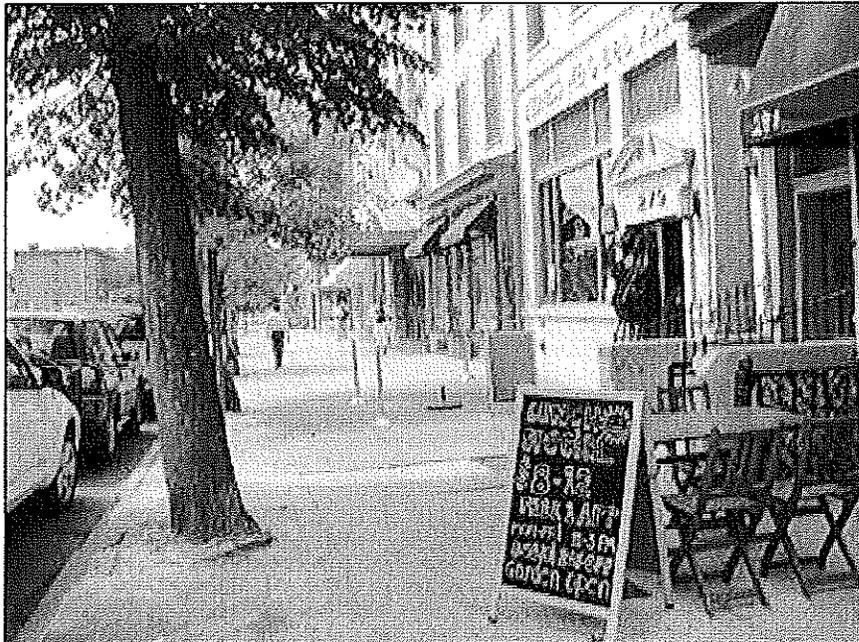




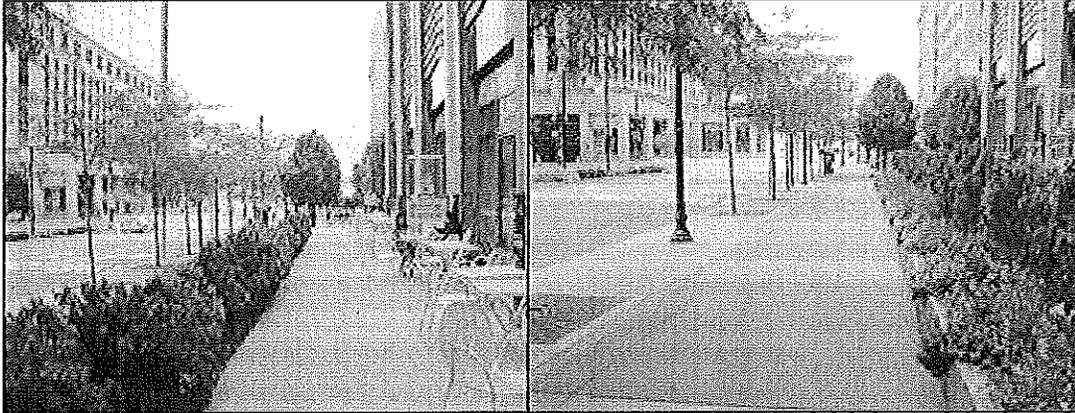
Sidewalks

Initial planning identified a minimum sidewalk width requirement of 20 feet. This width would allow for sufficient flexibility in the future uses within the sidewalk area. Of the 20 feet, 7 feet would be constructed as a sidewalk amenity strip, providing a space for

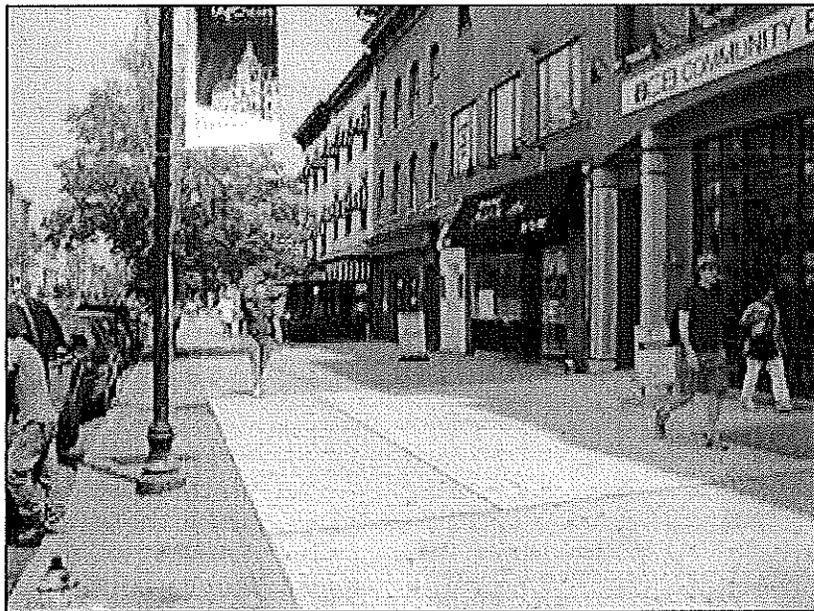
landscaping, benches and other street furniture, bicycle racks, lighting, signing, etc. The remaining 13 feet would serve pedestrian movements and access to the retail establishments to be developed on the first floor of adjacent buildings, while allowing space for the operation of sidewalk cafes and other activities that would serve to tie activities inside of the buildings into the public space fronting the buildings. The 232-foot boulevard concept incorporates a total of 18 feet of public space – 6 feet for the sidewalk amenity strip and 12 feet for the sidewalk area. This width is slightly less than desirable, but was made necessary due to physical constraints and conflicts with approved redevelopment plans in the area. Any further reductions in the width of the public space would eliminate the ability to create a flexible, attractive public realm, which was a guiding principle and primary intent of creating the urban boulevard in the first place. Following are a number of examples of sidewalk spaces in the surrounding areas.



Jersey City - Grove Street at Montgomery Street. Total of 20-feet, 4-inches from building face to edge of curb. The tree-pits are 4 feet by 4 feet, with the remaining 16 feet, 4 inches dedicated to walkway and sidewalk café seating space. As shown, the combination of the tree pits and the outdoor seating significantly restricts the walkable area of the sidewalk.



Jersey City - Montgomery Street at Hudson Street. Total of 36-feet, 8-inches from building face to edge of curb. This terraced configuration provides an elevated space 11 feet wide for outdoor seating, with an additional 4 feet, 4 inches of landscaping separating the upper seating area from the lower walking area. On the lower level, 5 foot by 5 foot tree pits separate the street from the 10 foot, six inch wide walking area.



Hoboken - Washington Street - Total of 25-feet, 3-inches from building face to edge of curb. The tree-pits are 4 feet by 4 feet, leaving 21 feet, 3 inches of clear walkable space.



Hoboken, NJ – Washington Street north of 1st Street. 24-feet, 6-inches from building to curb. 9-feet of outdoor café space, 11-feet of clear sidewalk, 4-feet 6-inch planting/amenities strip. Further down the block, this configuration continues with the addition of a bus shelter that encroaches into the sidewalk area by approximately 6-feet, leaving only 5 feet of clear walking area.



City of Hoboken – River Street north of Hudson Place – 20 feet from building face to edge of curb



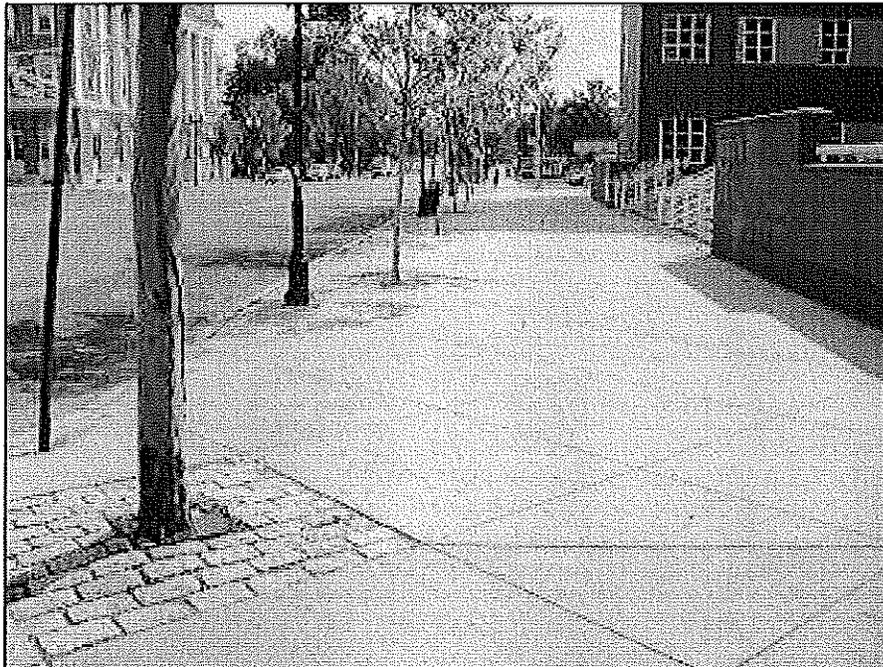
New York City – Battery Park City – North End Avenue north of Vesey Street. 20-feet, 6-inches from building to curb. 14-feet of clear space with 6-1/2 feet of amenity strip



New York City – Battery Park City – Vesey Street east of North End Avenue. 30-feet from building to curb. 14-feet of clear space, 10-feet of landscape/amenities, and 6-feet of clear space serving the M22 route bus stop.



Hoboken, NJ – Hudson Place east of River Street. 18-feet from building to curb. 9-feet, 6-inches of sidewalk with parking meters (clear zone of approximately 6-feet, 6-inches), and 8-feet 6-inches of outdoor café space.



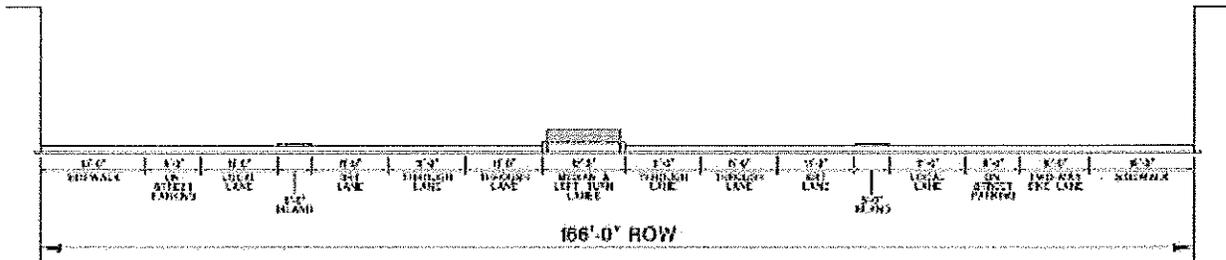
New Brunswick, NJ – Livingston Avenue in front of the Bloustein School of Planning and Public Policy. 22-feet from building to curb. 13-feet 6-inch clear sidewalk, 8-feet 6-inch planting and lighting strip.

In summary, the Route 440 / Routes 1&9T Urban Boulevard is being designed as a Main Street that will alter the character of the existing roadway, supporting and encouraging the creation of vibrant, sustainable, livable communities. Creation of a spacious, attractive, versatile and functional public realm is a critical element in successfully meeting the objectives the Jersey City Master Plan and the Bayside Vision. The above examples of sidewalks in similar settings demonstrate the need for wide sidewalks that not only provide a space for pedestrian movement, but serve as a focal point of an appealing public realm, allowing for the extension of the activities inside the buildings that will abut the corridor into the public space. This will serve to integrate the minor medians, bike paths, local travel lanes, and on-street parking lanes into the neighborhoods, creating an "environment" as opposed to just creating a transportation corridor.

V. 166-FOOT BOULEVARD ALTERNATIVE

Several options requiring a reduced width were investigated to determine the extent to which they would meet the objectives of the multi-use boulevard. One of these alternatives consisted of a 166-foot cross section between the building lines (Figure 3)

Figure 3 – 166 Foot Boulevard Cross Section



This alternative includes a 12-foot wide combination median / left turn island centered along the existing Route 440 Right of Way. Between intersections, the median would consist of landscaping in an elevated planter box. At the signalized intersections crossing Route 440, the landscaping would be replaced by dedicated left turn lanes. On each side of the center median, the boulevard would include 3 11-foot wide through travel lanes. The outermost lane in both the northbound and southbound directions would be reserved for the exclusive use of Bus Rapid Transit (BRT) vehicles. Adjacent to the BRT lanes would be a 5-foot wide median. Adjacent to the median would be an 11-foot wide local travel lane accommodating local traffic accessing the adjacent developments. Separating this local travel lane from the development areas would be an 8-foot wide on-street parking lane and a 15-foot wide sidewalk. Along one side of the roadway, a 10-foot wide two-direction bike lane would be inserted between the on-street parking lane and the sidewalk. This alternative is more utilitarian than the 232-foot alternative, and incorporates most of the travel components of the boulevard within the existing 112 foot wide Route 440 right of way. However, restricting the improvements to this narrow area prohibits this alternative from fully meeting the objectives for accommodating all travel modes along the corridor.

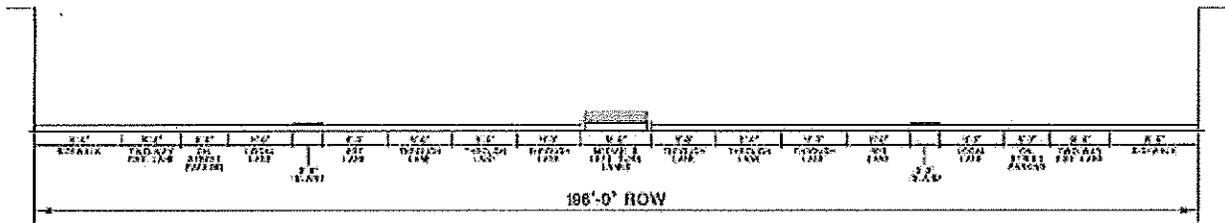
While this alternative fails to meet a number of the established objectives – mostly related to the creation of a walkable, bicycle friendly livable community - this alternative only provides 2 through travel lanes and 1 local travel lane in each direction. Future forecasts anticipate significant increases in travel demand associated with the planned and envisioned development growth along the western waterfront of Jersey City over the next 40 years. The number of travel lanes included in the 166-foot alternative would simply be insufficient to accommodate traffic flow to, from and through the area. Accordingly, this alternative is considered fatally flawed. In addition to this fatal flaw, this alternative has a number of other shortcomings including:

- The 12-foot wide center median does not allow for landscaping along the portions to be used for dedicated left turn lanes at the signalized cross-street intersections. This is likely to be a significant percentage of the length of the central section. Not only would continuous landscaping make the corridor more aesthetically appealing, it would serve to buffer the adjacent land uses from traffic noise emanating from the corridor.
- The 12-foot wide center median does not allow for the creation of pedestrian storage space within the median.
- This existing median is considerably wider than the 12-foot width included in this alternative. Significant utilities run along Route 440 within the median including a 42" diameter water line and a 48" diameter combined sewer line. Narrowing the median would result in vehicle travel lanes being constructed above the utility lines, requiring either relocation of these lines or significant structural shielding of the existing lines.
- If this alternative were to be constructed centered along the existing Route 440 right of way with the two-directional bike lane on the northbound side, the on-street parking lane on the north side of the boulevard would be constructed directly on top of a 36-inch diameter force main that runs along the corridor from Danforth Avenue to Culver Avenue. Extensive structural shielding would be required to protect the force main from the weight of vehicles traveling above it and from the vibrations that these vehicles would produce.
- The 5-foot wide minor medians are of insufficient width to accommodate bus shelters and associated amenities required for the effective operation of the BRT along the corridor.
- The 15-foot wide sidewalk does not provide adequate space for the incorporation of sidewalk amenities, furniture, landscaping, etc. while maintaining adequate space for pedestrian circulation. This would serve to minimize the value and vitality of the first floor retail establishments anticipated to occupy the first floors of the future development.
- Only one two-direction bike path is included in this alternative. In addition, 10 feet is an insufficient width to construct a two-directional bike path. For this type of facility, AASHTO guidance prescribes a minimum of a 10-foot wide riding surface, abutted on each side by a minimum of a 2-foot wide buffer space. A minimum of 14-foot of space is required.
- Placing the bike path between the on-street parking and the sidewalk would create unnecessary conflicts as drivers walk across the bike path to access their parked vehicles. Moving the bike path to the area between the on-street parking and the local travel lane would minimize this issue, but would create the need for an additional 3 feet to be added to the minimum 2 foot wide buffer strip between the bike lane and the roadway travel lane. A total of 17 feet would be required for the construction of this lane.

VI. 198-FOOT BOULEVARD ALTERNATIVE

A second utilitarian option requiring a reduced width was investigated to determine the extent to which it would meet the objectives of the multi-use boulevard. This option is similar to the 166-foot option as described previously, with a total width of 198-feet between the building lines (Figure 4).

Figure 4 – 198 Foot Boulevard Cross Section



This alternative includes a 12-foot wide combination median / left turn island centered along the existing Route 440 Right of Way. Between intersections, the median would consist of landscaping in an elevated planter box. At the signalized intersections crossing Route 440, the landscaping would be replaced by dedicated left turn lanes. On each side of the center median, the boulevard would include 4 11-foot wide through travel lanes. The outermost lane in both the northbound and southbound directions would be reserved for the exclusive use of Bus Rapid Transit (BRT) vehicles. Adjacent to the BRT lanes would be a 5-foot wide median. Adjacent to the median would be an 11-foot wide local travel lane accommodating local traffic accessing the adjacent developments. Separating this local travel lane from the development areas would be an 8-foot wide on-street parking lane, a 10-foot wide two-directional bike lane, and a 15-foot wide sidewalk. While this alternative seeks to incorporate all of the travel-way components of the 232-foot wide alternative, deficiencies remain with respect to meeting the objectives of the boulevard and creation of walkable, bicycle friendly livable communities.

As opposed to the 166-foot wide alternative, this alternative provides an adequate number of travel lanes to accommodate the future traffic demand. However, there remain a number of issues where this alternative fails to meet a number of the established objectives. Accordingly, this alternative is considered fatally flawed. The shortcomings that lead to this determination include:

- The 12-foot wide center median does not allow for landscaping along the portions to be used for dedicated left turn lanes at the signalized cross-street intersections. This is likely to be a significant percentage of the length of the central section. Not only would continuous landscaping make the corridor more aesthetically appealing, it would serve to buffer the adjacent land uses from traffic noise emanating from the corridor.

- The 12-foot wide center median does not allow for the creation of pedestrian storage space within the median.
- This existing median is considerably wider than the 12-foot width included in this alternative. Significant utilities run along Route 440 within the median including a 42" diameter water line and a 48" diameter combined sewer line. Narrowing the median would result in vehicle travel lanes being constructed above the utility lines, requiring either relocation of these lines or significant structural shielding of the existing lines.
- If this alternative were to be constructed centered along the existing Route 440 right of way, the local lane on the northbound side of the roadway would be constructed directly on top of a 36-inch diameter force main that runs along the corridor from Danforth Avenue to Culver Avenue. Extensive structural shielding would be required to protect the force main from the weight of vehicles traveling above it and from the vibrations that these vehicles would produce.
- The 5-foot wide minor medians are of insufficient width to accommodate bus shelters and associated amenities required for the effective operation of the BRT along the corridor.
- The 15-foot wide sidewalk does not provide adequate space for the incorporation of sidewalk amenities, furniture, landscaping, etc. while maintaining adequate space for pedestrian circulation. This would serve to minimize the value and vitality of the first floor retail establishments anticipated to occupy the first floors of the future development.
- Only one two-direction bike path is included in this alternative. In addition, 10 feet is an insufficient width to construct a two-directional bike path. For this type of facility, AASHTO guidance prescribes a minimum of a 10-foot wide riding surface, abutted on each side by a minimum of a 2-foot wide buffer space. A minimum of 14-foot of space is required.
- Placing the bike path between the on-street parking and the sidewalk would create unnecessary conflicts as drivers walk across the bike path to access their parked vehicles. Moving the bike path to the area between the on-street parking and the local travel lane would minimize this issue, but would create the need for an additional 3 feet to be added to the minimum 2 foot wide buffer strip between the bike lane and the roadway travel lane. A total of 17 feet would be required for the construction of this lane.

VII. SUMMARY

Extensive research and analysis has been undertaken to identify the mix of boulevard components that best meets the goals and objectives that the boulevard is intended to achieve. This analysis determined that the 232-foot wide alternative provides the optimum mix of desired boulevard component to serve all modes of transportation and create a walkable, bicycle friendly environment in support of livable communities while maximizing future development potential and minimizing adverse impacts to the existing properties and land uses along the corridor and within the surrounding area.