# 6. DEVELOPMENT OF CONCEPT ALTERNATIVES

## 6.1 Transportation Vision and Goals

The integration of land use and transportation planning is a key component of "smart growth" and sustainable development. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which became federal law in August 2005, defines the need to consider land use in the federally-supported surface transportation planning program. Within the planning factors set forth in 23 USC 134 (h) (1), the transportation planning should seek to *“improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development.”*

The coordination of land use and transportation planning requires consideration of how land use and transportation decisions affect each other, and how the integration of options for people to access opportunities, goods, services, and other resources improves the quality of life for people who live and work in the community. In keeping with this principle, the development of concept alternatives for the Route 440/Routes 1&9T study sought to support the mobility needs of the Western Waterfront with respect to movement of both goods and people. It also sought to support quality of life for existing neighborhoods within the Western Waterfront, as well as the creation of new livable communities by removing or minimizing the impacts of through trucks, and by providing complete streets that accommodate goods delivery, motorists, mass transit, bicyclists and pedestrians.

Three sets of concept alternatives were developed, as follows:

- Diversion of Through Trucks
- Route 440/Routes 1&9T Corridor
- Gateway Intersection

Alternatives for the Route 440/Routes 1&9T corridor and for the gateway Intersection were developed with significant detail. Aerial base mapping with topography at 1-foot contours was developed upon which the alternative layouts were prepared. The physical configuration of the alternatives was at a level sufficient to identify potential conflicts with existing and proposed buildings and historic and cultural resources within the study area. The geometric configurations of each alternative were developed following the standards set forth in:

- New Jersey Department of Transportation - Roadway Design Manual
- New Jersey Department of Transportation and Pennsylvania Department of Transportation - Smart Transportation Guidebook, March 2008
- American Association of State Highway and Transportation Officials - Policy on Geometric Design of Highways and Streets, 5th Edition
- American Association of State Highway and Transportation Officials - Guide for the Development of Bicycle Facilities, 3rd Edition

Through truck diversion alternatives were developed and evaluated at a more macroscopic level. The alternatives that incorporated the creation of new or the expansion of existing roadway and bridge infrastructure were prepared on aerial photography as opposed to detailed base mapping. The operational benefits of these alternatives were evaluated through application of the regional roadway network model only, with no detailed traffic operations and simulation modeling conducted. Since the corridor and gateway intersection alternatives were developed and evaluated with the assumption that no through truck diversion alternatives are constructed, advancement of these alternatives is to be undertaken as separate studies not directly tied to the advancement of improvements to the Route 440/Routes 1&9T corridor.

## 6.2 Transportation Objectives by Mode for Creation of a Multi-Modal Corridor

Development of alternatives for the corridor sought to address the following objectives:

### 6.2.1 Auto and Truck

#### 6.2.1.1 To provide through roadways

a. To serve through traffic, including trucks if necessary, traveling through the area with neither an origin nor a destination within the Western Waterfront.
b. To maintain mobility and segregate truck through traffic volumes from local traffic to the greatest extent possible.
c. To minimize the adverse impacts of truck traffic (noise, vibration, emissions) on the quality of life within the community.

**6.2.1.2 To provide land service roadways**

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

**6.2.1.3 To support an interconnected network of parallel local streets**

a. To reduce travel demand on the corridor through provision of alternative travel paths for vehicles and through provision of walking and biking alternatives to the automobile.
b. To provide local land access.

**6.2.1.4 To provide frequent cross streets**

a. To support the interconnectivity of a network of parallel local streets
b. To ensure east-west connectivity across the corridor for motorists.
c. To provide access from the corridor to the local street network.

### 6.2.2 Walking

**6.2.2.1 To provide frequent cross streets**

a. To ensure connectivity across the corridor for pedestrians
b. To provide access from the corridor to the local street network.
c. To ensure pedestrian access to a future HBLR station to the west of the corridor.

**6.2.2.2 To provide sidewalks and pedestrian pathways**

a. To provide pedestrian accommodation along and across the corridor.
b. To provide pedestrian access to building entrances along both sides of the corridor.
c. To provide pedestrian access to existing and future neighborhoods along both sides of the corridor.
d. To provide a recreational amenity for pedestrians.
e. To provide pedestrian access to public spaces.
f. To provide space for pedestrian amenities such as sidewalk cafés, kiosks, benches, street trees, etc.
g. To provide an attractive and safe environment for pedestrians.
h. To provide pedestrian access to a new HBLR station to the west of the corridor.

### 6.2.3 Bicycle

#### 6.2.3.1 To provide bicycle lanes and paths

a. To provide bicycle accommodation along and across the corridor.
b. To provide multiple and frequent access points to a future city bike lane network.
c. To provide bicycle access to building entrances along both sides of the corridor.
d. To provide bicycle access to existing and future neighborhoods along both sides of the corridor.
e. To provide a recreational amenity for bicyclists.
f. To provide bicycle access to public spaces.
g. To provide bicycle access to a new HBLR station to the west of the corridor.

### 6.2.4 Mass Transit

#### 6.2.4.1 To accommodate an HBLR Extension across the corridor and to provide access

To provide a grade-separated crossing of the corridor by an HBLR extension that is identified in the Circulation Element of the Jersey City Master Plan.

#### 6.2.4.2 To facilitate Bus Rapid Transit (BRT) service to Journal Square

To satisfy multiple goals and objectives of the Circulation Element of the Jersey City Master Plan through provision of a high-capacity, rapid public transit service that makes infrequent stops and that provides speedy service between existing and future neighborhoods along the corridor and the Journal Square Transportation Center.

#### 6.2.4.3 Local bus and jitney service

To provide frequent, flexible, affordable local service between residential, retail, employment, and other destinations, and to provide access other mass transit systems.

## 6.3 Local Cross-Street Network

### 6.3.1 Local Street Network

The project Purpose and Need Statement articulates the broad community goal of supporting mixed-use, walkable, and livable communities containing interconnected networks of streets that are planned along both sides of much of the length of the corridor. Creating a network of local streets will provide multiple alternative travel paths for vehicles, bicycles and pedestrians, providing enhanced access to existing and future neighborhoods, and expanded options and opportunities for local circulation within the neighborhoods. This local street network will also provide additional crossings of the Route 440 corridor, thereby enhancing access to the waterfront from neighborhoods on the east side of Route 440.

The expanded network of local streets, by enhancing walkability and encouraging bicycle use as a mode of travel will serve to reduce dependence on automobiles for local circulation within and between existing and future neighborhoods. The expanded network will also provide additional travel path choices, distributing traffic across the roadway system such that volume of traffic at individual locations will be reduced. Increases in walking and bicycling, as well as the reduced intensity of traffic at individual intersections throughout the network, will serve to mitigate congestion and improve the efficiency of the transportation network.

In the development of corridor alternatives, it was first necessary to anticipate the future land development in the Western Waterfront and develop a concept system, or network, of local streets that reduce travel demand on the corridor, connect with the corridor, and serve the access and circulation needs of the adjacent existing and future neighborhoods.

The concept grid, in part, incorporated the future local roadway networks that were previously defined as part of the Bayfront I Redevelopment Plan and NJCU West Campus Redevelopment Plan (shown in blue in Figure 6.1). Both of these plans delineate new roadways within their boundaries, create new intersections with Route 440, and modify existing intersections with Route 440. These local street networks are configured in a grid pattern creating individual block sizes that are small enough support a new walkable neighborhood and large enough to support private sector investment in redevelopment.

**Figure 6.1: Bayfront and NJCU Redevelopment Plan Local Street Network**

Building upon the street grids developed as part of the Bayfront and NJCU redevelopment plans, a concept grid of local streets for the central section of the Western Waterfront was developed. This local street network (Figure 6.2) was established in keeping with the NJDOT-PennDOT's Smart Transportation Guidebook, and was designed to provide internal connectivity, external connectivity and pedestrian route directness. Specifically, the following guiding principles were applied:

- Integrate new streets with the existing city street grid and the planned new street grids at Bayfront and the NJCU West Campus.
- Provide sufficient minimum block areas and block face lengths to support cost effective urban building design and private sector investment in redevelopment.
- Minimize block sizes and block lengths to maximize pedestrian route directness.
- Minimize the distances between crossings of the Route 440 and Route 1&9T corridor to maximize connectivity and pedestrian route directness between destinations on the two sides of the corridor.
- Provide pedestrian route directness to the existing HBLR station at Westside Avenue, a future HBLR station at the north edge of Bayfront, and future Bus Rapid Transit stations along the Route 440 corridor.
- Provide new parallel local street connections that avoid use of Westside Avenue, which is already overcapacity.
- Use a standard right-of-way width of 70 feet, with variations in a few locations, in order to make allowance for sufficient right-of-way width to accommodate two directional "complete streets", including on- street parking on both sides, minimum ten-foot sidewalks on both sides, and striped on-street bike lanes on both sides.

**Figure 6.2: Concept Local Street Grid – Western Waterfront**

Bayfront and NJCU West Campus streets in blue, Concept Grid in red

### 6.3.2 Bicycle / Pedestrian Crossings

As it exists today, the Route 440/Routes 1&9T corridor bifurcates the Western Waterfront, serving as a barrier to access between the neighborhoods on the east and west sides of the corridor, and inhibiting access to the waterfront. Integration of frequent safe bicycle and pedestrian crossings of the corridor is a key facet in the elimination of this barrier and the creation of a city-wide bicycle and pedestrian-friendly environment. In addition to facilitating integration of the existing and future neighborhoods on both sides of the corridor, frequent bicycle and pedestrian crossings will support and encourage utilization of public transit through enhanced access to HBLR and BRT stations and stops

In recognition of these benefits, this concept development study sought to integrate frequent and safe crossings of the corridor for bicycles and pedestrians in the development of concept alternatives. Providing frequent, safe and efficient crossings of the corridor for bicyclists and pedestrians will serve the overarching goal of reducing dependence on automobiles for local circulation and will assist in the mitigation of traffic congestion in the Western Waterfront.

## 6.4 HBLR Extension and BRT Service

A key element in the creation of livable communities is the integration of public transit services and facilities that are within easy walking distance of housing, businesses and recreational amenities within the community. New and expanded public transit service and opportunities will serve to reduce dependence on automobiles; enhance access to, from, and within all areas of Jersey City; and improve air quality.

### 6.4.1 HBLR Extension

In advancement of these goals and objectives, this concept development study sought to integrate expanded public transit opportunities to provide access to the study area's existing and future neighborhoods, as well as to provide connections to the regional public transit system. A significant element of the future public transit system to serve the Western Waterfront in an extension of the existing Hudson Bergen Light Rail to the west side of the Route 440 corridor as envisioned in the Circulation Element of the Jersey City Master Plan. NJ Transit has completed an Alternatives Analysis, which identified a preferred alignment and extension of the HBLR West Side Avenue line to the northern edge of the Bayfront Redevelopment Plan area (Figure 6.3).

**Figure 6.3: NJ Transit HBLR Extension Preferred Alternative[1]**


Extension of the HBLR to the west side of Route 440 will provide public transit access to downtown Jersey City, with connections to Manhattan, and to points north and south along the Hudson Riverfront via the regional public transit network operated by NJ Transit, Port Authority of New York and New Jersey, and various private operators. However, the HBLR extension will not provide access to the Journal Square Transportation Center, which is in the heart of Jersey City's Central Business District, and provides mass transit access to points west and north. A public transit link between the Western Waterfront and Journal Square is a key component in reducing reliance on automobile usage and supporting the creation of new livable communities within the Western Waterfront.

### 6.4.2 Bus Rapid Transit (BRT)

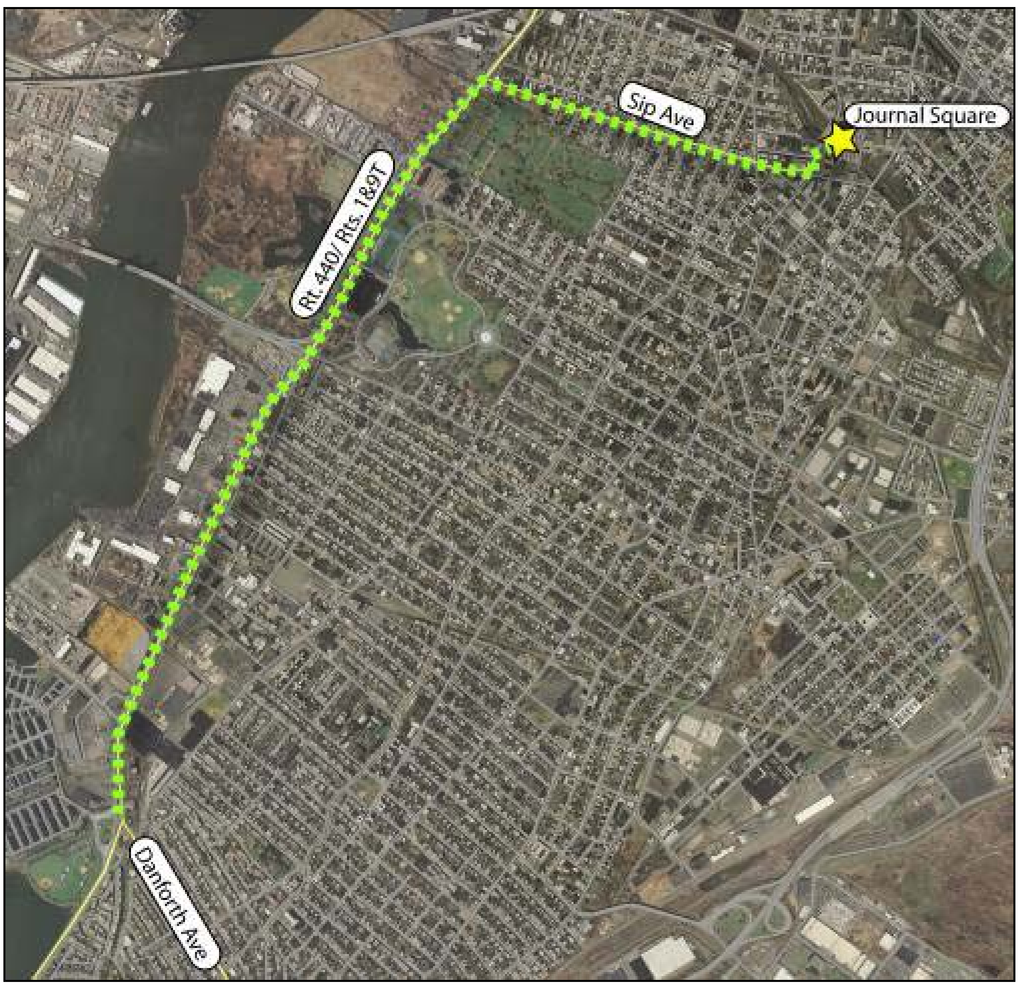
Development of corridor improvement alternatives considered the need for integration of Bus Rapid Transit (BRT) facilities into the corridor to provide the high capacity, frequent, rapid transit service to the Journal Square Transportation Center (Figure 6.4). BRT systems offer

[1] *Source: Hudson Bergen Light Rail Route 440 Extension Alternatives Analysis – Jan 28, 2011*

the high-capacity, high-speed service offered by light rail systems, but at a lower cost and without the physical operational constraints imposed by operation on a fixed guideway. BRT systems differ from traditional local and regional bus transportation systems by offering the following:

- Travel in bus priority Lanes
- Frequent service
- Infrequent stops
- Specialized buses and shelters to accommodate faster boarding and alighting
- Advance ticketing for faster boarding
- Branding to distinguish BRT from local bus service

**Figure 6.4: Proposed BRT Route – Western Waterfront to Journal Square**



## 6.5 Diversion of Through Trucks

Key to the creation of livable communities along the Western Waterfront of Jersey City is the minimization of impacts of heavy truck traffic. The most effective method to avert the impacts of heavy truck traffic along the corridor is to divert through trucks (those heavy truck trips without an origin or a destination internal to the Western Waterfront study area) away from the corridor altogether. While truck accessibility is required for local deliveries, diversion of through trucks would serve to enhance livability in the Western Waterfront by reducing the vibration, noise and emissions that are attributable to through trucks. Towards this end, the study sought to identify alternatives that divert heavy through trucks away from the study corridor.

### 6.5.1 Policy Considerations - Corridor Truck Prohibitions

While it may be physically possible to accommodate heavy trucks on alternate routes through Jersey City (notwithstanding the negative impacts of congestion, vibration, noise and emissions to neighborhoods along these alternate routes), the process to implement a prohibition of heavy through trucks from the Route 440/Routes 1&9T study corridor in Jersey City is complicated by legal precedents and policies.

### 6.5.2 Highway System Background and Definition of Route 440/Routes 1&9T

The *Dwight D. Eisenhower National System of Interstate and Defense Highways* consists of limited access facilities of the highest importance to the nation, built to uniform geometric standards. They connect, as directly as practicable, the principal metropolitan areas, cities and industrial centers and provide important routes to, through and around urban areas. They serve national defense purposes and connect at border points with Canada and Mexico along routes of continental importance.

When the system specifications for the *National System of Interstate and Defense Highways* were devised, a key consideration was the incompatibility of at-grade intersections, both with railways and other roadways, with the intended operational characteristics of the highways. Restricting access to interchanges with ramps and acceleration / deceleration lanes allows vehicles to enter and leave the highway with minimal effect on the through traffic stream. Interstate highways do not have direct driveway access to adjacent properties, grade-level intersections, transit stops, pedestrian facilities or railroad grade crossings, all of which interfere with the rapid and free flow of traffic. By virtue of this definition, the study corridor is not designated as part of the US Interstate Highway System.

Federal guidelines establish a hierarchy of other roadways. While the federal government establishes the classification system, the designation of roadways as one type of highway is a matter of state responsibility. The hierarchy is as follows:

1. National Highway System (NHS) Routes (Non-interstate Routes)
2. Non-Interstate Strategic Highway Network (STRAHNET) Routes
3. Major STRAHNET Connector
4. Intermodal Connector
5. Un-Built NHS Route
6. Other Roads (not on NHS)

The Route 440/Routes 1&9T corridor within Jersey City is designated as a National Highway System (NHS) route. NHS routes are typically urban and rural principal arterials. The portion of Route 440 within Bayonne, south of the southern boundary of the Route 440/Routes 1&9T study area, is designated a STRAHNET Connector; however, the Route 440/Routes 1&9T study does not propose any changes to this section of the highway. As the STRAHNET designation ends before the Route 440/Routes 1&9T study area corridor begins, STRAHNET restrictions are not applicable to this study.

### 6.5.3 Applicable Federal Regulations for Large Trucks

***<u>Federal Policies and Regulations Regarding Trucks</u>*** **-** As an NHS highway, Route 440/Routes 1&9T is subject to federal regulations, but the NHS designation itself is determined by the State of New Jersey. Additionally, Route 440/Routes 1&9T is designated as a National Network highway. The National Network of highways is a transportation network composed of NHS and non-NHS highways available to trucks as authorized by provisions of the Surface Transportation Assistance Act of 1982 (STAA), identified in Title 23 of the Code of Federal Regulations Part 658 (23 CFR 658) (Appendix 6.1). These regulations are more critical in regard to the potential for prohibition of trucks on Route 440/Routes 1&9T.

The STAA of 1982 made a major impact in the way freight is moved in the country by permitting larger dimensioned trucks, up to 102 inches in width and 65 feet in length (allowing for tandem trailers). Prior to 1982, trucks were limited to 96 inches in width and 48 feet in length (length assumes a trailer unit is attached to the cab). Double bottom tandem trailers were previously not allowed on NJ highways. As a result of the larger vehicles permitted by the STAA, the federal government required all states to develop a National Network for the larger vehicles that provided routes to be used for interstate and intrastate commerce. The systems that developed in NJ provided a National Network of major interstate and Primary State Highway (National Highway System (NHS)), as well as access routes for the larger trucks to use to gain access to state commerce.

The National Network designation of Route 440/Routes 1&9T occurred subsequent to the NHS designation and exists independently of the NHS designation. National Network status applies only to the highway's role in interstate and intrastate commerce as it concerns large trucks as defined by the STAA of 1982. The establishment of National Network highways was required by federal law; as a consequence, federal regulations apply to their management.

***Diverting Trucks Under Federal Guidelines*** - Diverting trucks from a National Network road requires two steps. The first step involves the removal of the highway from the National Network. Section 685.11(d) of Title 23 of the US Code (Appendix 6.1) requires that any deletion of any specific segment of the approved National Network be approved by the Federal Highway Administration (FWHA). This action can be initiated by the FWHA or by request from the governor or an authorized representative of the state. Justification for the request is to be based on the following:

- Analysis of safety problems
- Economic analysis on interstate commerce
- Analysis and recommendation of alternate routes
- Evidence of consultation with local governments

However, these justifications do not apply. Safety is not a documented concern along the Route 440/Routes 1&9T corridor. A NJDOT safety analysis has identified the crash rate along the subject corridor as being less than the statewide average for similar facilities. The current study does not address expressly the economic impact of prohibiting through trucks along the corridor on interstate commerce. Identification and analysis of a range of alternative routes for use by through trucks was undertaken in this study. These alternative routes for use by heavy trucks were presented to and municipal officials, representatives of adjoining municipalities, the New Jersey Turnpike Authority and the PANYNJ. In addition, these potential routes were presented at Technical Advisory Committee, Stakeholder Working Group and Public Information Center meetings.

The second step involves the identification of a viable alternate route for use by heavy trucks. The test for a viable alternate route was established by a recent Supreme Court opinion. On February 21, 2006, the U.S. Third Circuit Court of Appeals upheld a lower court's opinion (the Chesler Decision) that New Jersey's truck routing regulations adopted in 1999, which restricted interstate large trucks to the National Network, were unconstitutional, violating the Interstate Commerce clause of the U.S. Constitution. The challenged truck routing regulations required interstate trucks (those with no local stop in New Jersey) to use the National Network roadway, while trucks with local deliveries (deliveries in New Jersey) were permitted to use the Access Network to reach their destination. Access Network roads included a combination of state highways and local roads generally meeting the design capacities for heavy trucks, although the adjacent land uses and some road segments were not compatible with significant daily volumes of heavy truck traffic.

In some locations, traveling through New Jersey on the Access Network roadways provided a shortcut in total miles or avoided tolls found on the New Jersey's National Network roadways. As a consequence; restricting interstate truck trips to the National Network required a longer and more costly trip. Regardless of the fact that the National Network traveled through truck-compatible land uses, which was an issue for the public and NJDOT, the Court found that forcing interstate truck trips to a longer and more costly route represented discrimination against interstate commerce, which is prohibited by the U.S. Constitution.

In regard to Route 440/Routes 1&9T, the Court's opinion indicates that, as long as the diverted route is not more onerous or costly than the existing route, the diversion is acceptable on a Constitutional level. As such, if an equally efficient or more expedient route can be found to substitute for Route 440/Routes 1&9T, the diversion will comply with the goals of the Interstate Commerce clause. A route that is longer or otherwise complicated for truck drivers will likely be unacceptable, regardless of the compatibility of adjacent land uses or the intended public benefit of the diversion.

One additional caveat in seeking an alternate route is the effect of history and perception. Routes 1&9T was created because heavy trucks cannot use the Pulaski Skyway (Routes 1&9). The truck route designation (Routes 1&9T) is therefore significant. Deleting this long-established route may be viewed as an impediment to commerce simply because it has been used for so long by interstate trucks.

### 6.5.4 Applicable New Jersey State Regulations for Large Trucks

The New Jersey Administrative Code (NJAC) 16:32 speaks to the definition of the New Jersey Access Network Travel Routes (i.e., truck routes) available for the use of 102-inch wide and tandem trailer trucks. The subject corridor is currently included in the list of NJDOT-approved truck routes in New Jersey, with no restrictions on the use of this roadway by any vehicle.

Similar to the federal regulations, the NJAC incorporates procedures and criteria for requesting a change in the network designation (Appendix 6.2). It is important to note that, under the current large truck regulations, placing a restriction on the corridor would affect 102-inch wide and tandem trailers only and would not apply to 96-inch wide single trailers or smaller vehicles. This is due to the fact that the Access Network Travel Routes were established specifically in response to the 1982 Federal Surface Transportation Assistance Act, which, as described above, permitted larger trucks on the nation's highways. The NHS status of the highway enables the highway to be used by pre-1982 large trucks (those 96 inches in width or smaller).

Consequently, both the Access Network designation and the National Network designation would need to be removed and the highway declassified from its current NHS status to prohibit large trucks on Route 440/Routes 1&9T. Removing only the National Network designation has no effect on the truck traffic as the Chesler Decision found that restricting interstate trucks to the National Network when an equally viable route (the Access Network) is available is unconstitutional. As long as the highway continues to be listed as an Access Network roadway, all interstate trucks are permitted on the road. As long as the highway remains designated as a NHS roadway, trucks that are 96 inches in width or smaller are permitted by right.

Removal of the NHS designation requires modification of Route 440/Routes 1&9T such that the highway no longer meets the criteria of a NHS highway. The addition of pedestrian facilities and traffic calming measures (measures that affect the flow of traffic) could qualify as measures compromising the value of the highway as an NHS route, depending upon the severity of the effect on the ability of trucks to utilize the corridor. Since the corridor will need to accommodate local truck traffic, it is unlikely that an alternative would be developed and advanced as the preferred alternative in this study that could accommodate all local truck movements but not through truck movements. The NJDOT is responsible for approving the declassification; however, NJDOT, as the transportation authority, is charged with providing and maintaining roadway capacity for the purposes of transportation and commerce. Reducing the classification of Route 440/Routes 1&9T to a lesser-capacity roadway is an action contrary to NJDOT's mission. While NJDOT may approve the declassification, it is unlikely that state or federal funds could be applied to the improvements proposed to reduce the capacity of the highway. The burden of funding the improvements would likely lie with the local government, in this case, the City of Jersey City.

### 6.5.5 Potential for Successful Implementation of a Through Truck Prohibition

While the current governing regulations suggest that prohibition of through trucks along the corridor is possible, factors such as the relatively short length of the corridor and the onus of demonstrating that the alternative truck routes are truly equivalent, compounded by the lack of a physical constraint and historic crash rates that are below the statewide average for similar roadways, diminish the likelihood of successfully diverting trucks from Route 440/Routes 1&9T. Simply identifying an alternate route does not mean that it will be deemed equivalent. The alternate route ideally would be similar in length, have similar travel speeds (and therefore result in similar travel time for the truck) and not require payment of new or increased tolls. An equally ineffective strategy would be to physically alter Route 440/Routes 1&9T such that the existing truck route would become more onerous for truck drivers, thus lowering the bar on the required efficiency of alternate routes. This approach may work for new highway segments, but is unlikely to proceed without legal challenge on existing truck routes. Further, the corridor improvements alternatives were designed to accommodate large trucks making local deliveries and servicing the future land development. By accommodating local truck activity, the corridor would necessarily be capable of accommodating through truck activity as well.

By way of example, recently NJDOT approved a prohibition of trucks along Route 29 in Trenton as part of the reconstruction of the waterfront roadway. Similar to some alternatives proposed for Route 440/Routes 1&9T, this roadway system included a tunnel, which is subject to strict national safety and fire code standards. Typically, large trucks carrying hazardous materials are banned from use of tunnels longer than 800 feet, which require mechanical ventilation systems. It was determined that, since alternates were available, it was best to prohibit trucks on this small stretch of highway. Trucks are able to make local deliveries by using the local street system.

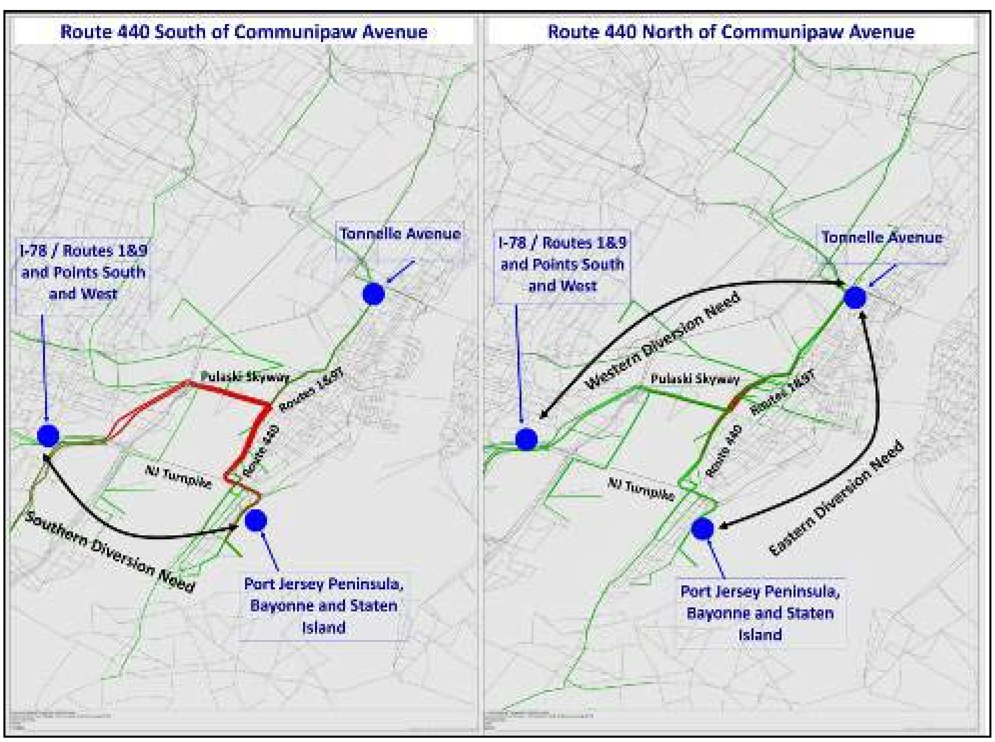
The Route 29 connector was a new highway that was added to the highway system. Unlike Route 29, Route 440/Routes 1&9T has been used for freight transportation for decades. "Game changing" improvements that alter the efficiency of the existing truck route, such as the incorporation of a tunnel that would preclude use by trucks, may be interpreted as unnecessary ploys to divert truck traffic, as other more cost-effective improvements may be made to Route 440/Routes 1&9T to achieve the same goals as truck-prohibitive improvements. Significant truck-averse improvement may be used in the process of declassifying the highway as an NHS highway (and by that eliminate truck traffic), but the cost for the improvements would likely be born completely by Jersey City, as it is highly uncommon for state and federal agencies to participate in capacity-reduction projects. Additionally, it is important that the National Network designation be removed along with the NHS designation, and it is not clear that Route 440/Routes 1&9T meet the four criteria for removal from the National Network.

The more viable option for separating through trucks from the proposed urban boulevard is the identification of an equal alternative route that separates through trucks from local traffic without diverting trucks from Route 440/Routes 1&9T, such as cut-and-cover roadways that limit enclosed areas to less than 800 feet. The equal diversion route option must be considered carefully with the understanding that the recent Court opinion indicates that traditional land-use based planning justifications, such as land use incompatibility or public opposition, are unlikely to be considered legitimate reasons for requiring trucks to utilize a longer or more costly alternative routing.

## 6.6 Through Truck Diversion Alternatives

With the understanding that an outright prohibition of through truck traffic on Route 440 and Routes 1&9T is not feasible, the through truck diversion alternatives seek to attract freight carriers to roadways or travel modes that are alternatives to the Route 440/Routes 1&9T in Jersey City, while providing or maintaining a level of access that permits service by trucks to various types of destinations internal to the Western Waterfront study area. Prior to identification of through truck diversion alternatives, it was necessary to understand how through trucks are currently utilizing the corridor. Utilizing the NJRTM-E, and the data set developed by this study, a select link analysis was conducted to determine the origins and destinations of heavy trucks utilizing the corridor. A select link analysis is a network modeling process that looks at a single point on a roadway network (the select link) and illustrates where the traffic on that link came from (the origin) and went to (the destination). The output of a select link analysis (Figure 6.5) is a plot of the model roadway network overlaid with lines of varying width. The width of the line is a representation of the proportion of the vehicles (in this case trucks) traveling on the select link that are traveling on all other roadways in the network.

**Figure 6.5: Select Link Analysis – Trucks Utilizing the Route 440 Corridor**



While numerous individual truck destination pairs are exhibited in the model, the origin-and destination of through-trucks traveling along the Route 440 / Routes 1&9T study corridor and through the study area may be characterized as traveling between two of three external origin and destination points. These points include:

- Northern Points – through trucks with origins or destinations north of the study area, which travel through the Tonnelle Circle.
- Western Points - through trucks with origins or destinations west of the study area, and points south of the study area to the west of Newark Bay, which travel on Routes 1&9T in Kearny and Newark.
- Southern Points - through trucks with origins or destinations on the Port Jersey Peninsula, the City of Bayonne and other points south of the study area, which travel through Route 440 at the southern border of Jersey City.

The identification of through truck diversion alternatives focused on identifying travel paths between these three points that would not require use of the Route 440/Routes 1&9T corridor (Figure 6.6).

**Figure 6.6: Through Truck Origin and Destination and Diversion Needs**

The regional roadway network in the future is expected to include a number of transportation infrastructure improvement projects being advanced by others (Table 6.1 and Figure 6.7). These projects represent the "no-build" scenario for this study, and are expected to expand regional roadway system capacity, reduce regional congestion, increase regional mobility and generate some degree of through truck diversions away from the Route 440/Routes 1&9T corridor in Jersey City. The anticipated diversion of through truck trips away from the Route 440 and Routes 1&9T corridor that are attributable to these existing projects under the "no-build" scenario are referred to in this study as "organic diversions". All of these infrastructure improvement projects are expected to be completed by 2035, and are included in the 2035 and 2050 roadway network models developed for this study. By the year 2020, all of these projects with the exception of the Goethals Bridge improvements and the Bayway Refinery Area Access Improvements (NB-11 and NB-12) are expected to be completed and are incorporated into the 2020 network model developed for this study.

**Table 6.1: Infrastructure Improvement Projects Being Advanced by Others**

| Project # | Project Title | Location | Lead Agency | Completion by… |
|---|---|---|---|---|
| NB-1 | NJ Turnpike Interchange 14-A | City of Jersey City | NJ Turnpike Authority | **2020** |
| NB-2 | Charlotte Circle Elimination | City of Jersey City | NJ Dept of Transportation | **2020** |
| NB-3 | Routes 1&9 T St. Paul's Avenue Viaduct Replacement | City of Jersey City | NJ Dept of Transportation | **2020** |
| NB-4 | "New" Road from St. Paul's Avenue to Secaucus Avenue | City of Jersey City / Town of Secaucus | NJ Dept of Transportation | **2020** |
| NB-5 | Route 7 / Wittpenn Bridge Improvement | City of Jersey City / Kearny | NJ Dept of Transportation | **2020** |
| NB-6 | Pennsylvania Avenue and Fish House Road Improvements | Kearny | NJ Dept of Transportation | **2020** |
| NB-7 | Central Avenue Interchange with Routes 1&9 T Improvements | Kearny | NJ Dept of Transportation | **2020** |
| NB-8 | Doremus Avenue Interchange with Routes 1&9 T Improvements | City of Newark | NJ Dept of Transportation | **2020** |
| NB-9 | NJ Turnpike Interchange 15-E | City of Newark | NJ Turnpike Authority | **2020** |
| NB-10 | Reopening of the Holland Tunnel to 2 and 3 axle truck traffic | City of Jersey City | Port Authority of NY/NJ | **2020** |
| NB-11 | Goethals Bridge Capacity and Operational Improvements | City of Elizabeth / Staten Island, NY | Port Authority of NY/NJ | **2035** |
| NB-12 | Bayway Refinery Area Access Improvements | City of Elizabeth | NJ Dept of Transportation | **2020** |
| NB-13 | On-Dock Rail at Global Marine Terminal | City of Jersey City | Port Authority of NY/NJ | **2020** |
| NB-14 | NYNJ Railroad Rail Float Bridge Expansion | City of Jersey City | Port Authority of NY/NJ | **2020** |

**Figure 6.7: Transportation Infrastructure Projects Being Advanced by Others**


While these transportation infrastructure projects are expected to significantly enhance regional freight mobility, eliminate port drayage trips from the Route 440 and Routes 1&9T corridor, and create more attractive alternative truck travel paths that will attract an additional portion of heavy through truck travel away from the Route 440/Routes 1&9T corridor, some volume of heavy through trucks will remain. For the purposes of this study, a range of transportation improvement alternatives was developed for investigation at a conceptual level to determine effectiveness in reducing the volume of heavy through trucks that would utilize the study corridor. These through truck diversion alternatives included alterations to area roadways, enhancement of the rail network serving the ports, and the potential for creation of freight ferry/barge systems.

### 6.6.1 Freight Rail Concepts

#### 6.6.1.1 Existing Port Volumes and Rail System Operations

On March 2, 2011, the PANYNJ announced that in 2010, nearly 5.3 million containers were moved through the ports, representing an increase of nearly 16 percent over 2010, exceeding the PANYNJ projections of a 5 to 6 percent increase for 2010. This total is just below the ports peak activity year of 2007. Approximately 12 percent, or over 635,000 of these containers, were transported to and from the ports by rail.

Rail service and capacity developments on a national level have significant implications on the capacity and efficiency of the overall transportation system in Northern Jersey. If freight rail traffic cannot get to and from the region due to constraints in the national system, then the freight that would otherwise have been moved by rail will need to be transported some other way, most likely by truck. It is therefore critical to the entire transportation system in Northern New Jersey that the capacity of the freight rail network be maintained and expanded in line with the anticipated growth in port-related freight being transported by rail. As detailed in Chapter 5, the volume of containers moved to and from the ports by rail has the potential to increase by approximately 650 percent by the year 2050. This potential growth is due to a combination of the potential tripling of the volume of freight moved through the ports by the year 2050, and a doubling of the proportion of this freight that is moved by rail.

Currently, constraints on the national rail network do not have a significant impact on the movement of freight in New Jersey. Figure 6.8 depicts the operating level of service on the major national network rail corridors. Figure 6.9 depicts the anticipated level of service on the national rail network if anticipated growth occurs without expansion in the capacity of the system. As defined in the Association of American Railroads *National Rail Freight Infrastructure Capacity and Investment Study, September 2007*, "rail corridors operating at LOS A, B, or C are operating below capacity; they carry train flows with sufficient unused capacity to accommodate maintenance work and recover quickly from incidents such as weather delays, equipment failures, and minor accidents. Corridors operating at LOS D are operating near capacity; they carry heavy train flows with only moderate capacity to accommodate maintenance and recover from incidents. Corridors operating at LOS E are operating at capacity; they carry very heavy train flows and have very limited capacity to accommodate maintenance and recover from incidents without substantial service delays. Corridors operating at LOS F are operating above capacity; train flows are unstable, and congestion and service delays are persistent and substantial. The LOS grades and descriptions correspond generally to the LOS grades used in highway system capacity and investment requirements studies".

**Figure 6.8: Level of Service – National Rail Network – Existing Condition**

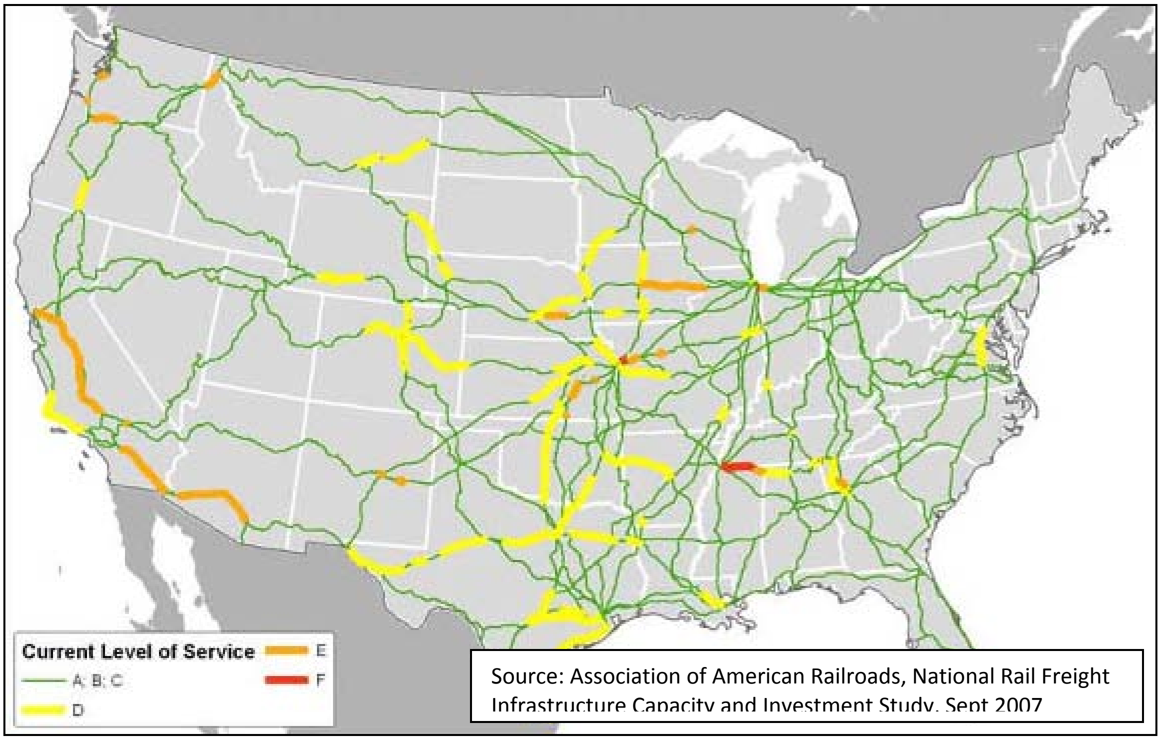
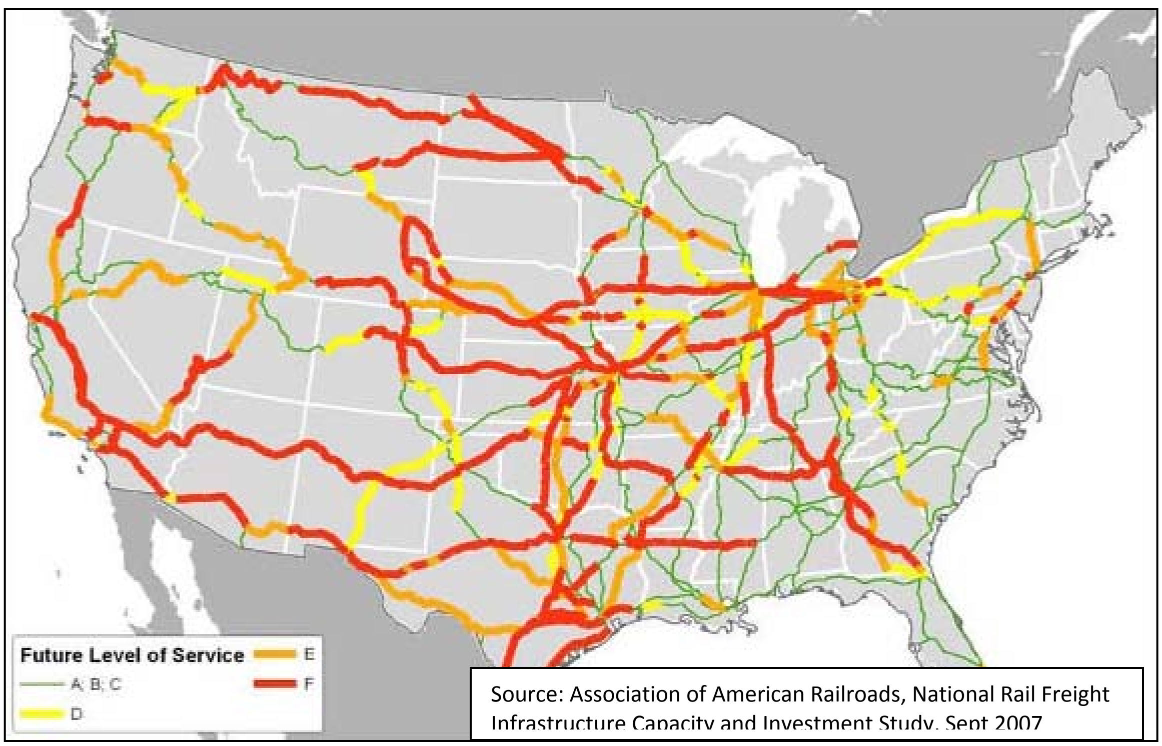
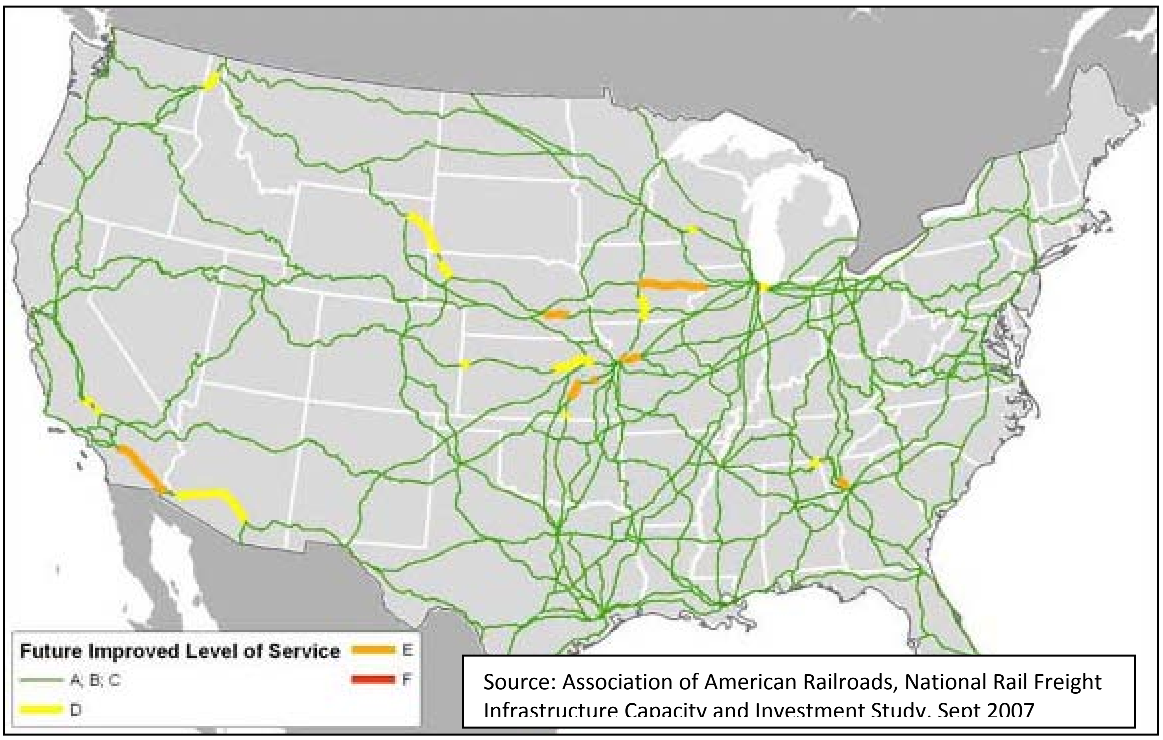



**Figure 6.9: Level of Service – National Rail Network – Future Unimproved Condition**



Fortunately, a number of improvement programs are in various stages of planning, design and construction that will ensure the national rail network has sufficient capacity to meet the future demand. Figure 6.10 depicts the anticipated level of service on the national rail network subsequent to completion of these improvements. As shown, portions of the system that would likely continue to operate close to capacity at levels of service D and E are located within the Midwestern portions of the United States, and are not expected to significantly affect rail operations in northern New Jersey.

**Figure 6.10: Level of Service – National Rail Network – Future Improved Condition**




#### 6.6.1.2 Freight Rail System Capacity in Northern New Jersey

The capacity of a roadway corridor is generally determined by the number of travel lanes, type of traffic control in place and the mix of vehicle types utilizing the roadway. In an analogous fashion, the capacity of a rail corridor may be viewed as a function of four primary variables:

- Single track versus multiple track corridors - With a few notable exceptions, most of the primary freight rail corridors in the NJTPA region are single track with sidings for the passing of trains. The use of sidings impedes the free flow of trains, often requiring a train to come to a stop within a siding and await the passing of another train.

- Shared passenger and freight operation – Freight trains often share trackage with passenger trains. On shared service lines owned by a railroad that provides passenger service, the time of day that freight trains are permitted to operate on the line are often highly restrictive, limiting the number of freight trains that can be operated on a daily basis.
- Variation in the type of control system affects the number of trains that can safely traverse a corridor on a daily basis. Control systems vary from No Signal (N/S) and Track Warrant Control (TWC) to Automatic Block Signaling (ABS) to Centralized Traffic Control (CTC). While TWC control may be appropriate and acceptable for current volumes, servicing of future demands may be highly constrained by maintaining the existing control systems, suggesting the need to upgrade to ABS or CTC systems.
- Variation in the types of trains operating along a corridor will affect the maximum speed and minimum spacing of trains on the corridor due to varying weights and braking capabilities. A uniform mix of train types can be operated with uniform speeds and spacing, increasing the effective utilization of the track. When variations in the types of trains utilizing a corridor exist, longer spacing between trains reduces the overall capacity of the corridor.

Estimates of daily train moves and capacity on the primary freight rail lines serving northern New Jersey were developed as part of the NJTPA's Freight System Performance Assessment Study. As part of the NJTPA Freight Rail Grade Crossing Assessment Study, observations of train activity on the primary lines serving northern New Jersey were conducted in the fall of 2007 when regional freight rail activity was at its peak. Based upon these two studies, Table 6.2 summarizes the capacity and typical daily activity levels on the primary freight rail lines serving northern New Jersey.

**Table 6.2: Northern New Jersey Freight Rail Capacity and Daily Activity**

| | NS Lehigh Line | CSX Trenton Line | NJSAA Lehigh Line | Northern Running Track | National Docks | Chemical Coast | Port Reading Secondary | CSX River Line |
|---|---|---|---|---|---|---|---|---|
| Average Daily Freight Trains | 18 | 13 | 32 | 23 | 16 | 17 | 3 | 22 |
| Average Daily Total Trains | 18 | 13 | 94 | 25 | 16 | 17 | 3 | 22 |
| Peak Day Trains | 23 | 16 | 100 | 29 | 20 | 21 | 4 | 28 |
| ** 2007 Field Observations | 23 | 23 | 100 | n/a | 12 | 12 | 3 | 21 |
| Existing Capacity | 30-40 | 30 | 81-100* | 42 | 36 | 21 | 15 | 30 |
| Unused Capacity | 7-17 | 14 | 0 | 13 | 16 | 0 | 12 | 2 |

*41 on single track segment; 81-100 on double track segment
** NJTPA Freight Rail Grade Crossing Assessment Study 24-hr observations
Source: R.L. Banks Associates, Inc., NJTPA Freight System Performance Assessment Study

A significant unused capacity for an increase in freight rail activity exists on the network service in the region. However, at the time of the NJTPA Freight System Performance Assessment Study, bottlenecks existed on individual lines that limited the potential for growth in the number of trains moving to and from the region on a daily basis. Since the completion of the study, several improvements have been completed that further enhanced the capacity of the northern New Jersey freight rail network. Two of these improvements provided significant enhancement in the operational efficiency of the rail network in the region.

As part of the National Docks clearance improvement project, the Bergen Tunnel was recently modified to increase the vertical clearance within the tunnel. This tunnel heightening allows double stack container trains to utilize this route, allowing a portion of the anticipated growth in volume of freight movement to be accommodated without an increase in the number of daily trains. This improvement does not increase capacity on the rail line by increasing the daily number of trains that can be moved through the tunnel. Rather, this improvement increases the daily number of containers that can be moved through the tunnel by virtue of being able to stack containers.

The second project was completion of the Corbin Street Yard in the City of Newark by the PANYNJ. Prior to completion of this yard, running track along the Chemical Coast line was periodically utilized for the positioning and assembly of train sets. This activity impeded the use of the running tracks for movement of trains to and from the area. Providing a yard facility to manage the assembly of train sets off-line significantly enhances the number of trains that may be moved along the Chemical Coast line on a daily basis.

Other potential improvements that would significantly enhance capacity on the northern New Jersey rail network are currently under investigation. The PANYNJ is investigating improvements necessary to accommodate the anticipated increase in rail activity associated with the expansion of the Greenville yard. These improvements, while not yet defined, are focused upon providing the capacity necessary to transport up to 250,000 containers annually from the expanded Global Marine terminal.

Other improvements such as the potential reactivation of the Raritan Industrial Track between Perth Amboy and Metuchen would provide a new route for the movement of freight by rail from Oak Island Yard to Metuchen Yard for local distribution. Addition of a third track on the NS Lehigh Line is being advanced to provide additional capacity to accommodate growth in demand along the corridor between the Oak Island Yard in Newark and the Manville Yard in Manville, Somerset County.

As rail intermodal traffic continues to grow, it will become more feasible and more beneficial to segregate traffic groups bound to the core of the region versus traffic bound to outlying locations. It is therefore vital to preserve and expand capacity at the rail facilities and terminals closer to the port for use in segregating traffic groups. The greater the capacity and the lower the costs of operating and accessing close-in terminals, the less need there is to focus activity at outlying terminals.

### 6.6.2 Freight Rail Concept Alternatives

Freight rail concepts provide new or expanded capacity and opportunities for transporting freight through the study area utilizing rail instead of trucks (Figure 6.11). These concepts focus primarily on moving freight to and from the area marine terminals.

**R-1**: Expand New York New Jersey Railroad operations for movement of intermodal traffic across the Hudson River. The Port Authority of NY/NJ is currently advancing improvements to the NYNJ Railroad including rehabilitation/expansion of the only remaining rail float bridge across the Hudson River, which connects Greenville Yards in

Jersey City to Brooklyn. These improvements will increase the capacity for movement of freight between New Jersey and New York by rail as opposed to truck. This is not a new concept developed as part of this study. This initiative was incorporated into the future demand forecasts developed for this study so that the potential for these improvements to divert through trucks from the study corridor is captured in the analysis of future conditions.

**R-2**: Create near-dock rail at the Global Marine Terminal (a.k.a. Express Rail) and expand local freight rail shuttle to move containers between the port and regional distribution terminals (terminals that support freight distribution throughout the region). The PANYNJ has recently completed expansions of the ExpressRail system serving the Newark/Elizabeth Seaport Complex, and is advancing plans for the creation of Express Rail service at the Global Marine Terminal on the Port Jersey Peninsula and expansion of the Greenville Yard. The Express Rail and yard expansion are anticipated to remove all of the current drayage trips between Port Jersey and other local rail terminals including Croxton Yards, North Bergen Yard and Little Ferry Yard from the Route 440 and Routes 1&9T corridor. This is not a new concept developed as part of this study. This initiative was incorporated into the future demand forecasts developed for this study so that the potential for these improvements to divert through trucks from the study corridor is captured in the analysis of future conditions.


Figure 6.**11: Rail Concepts for Diversion of Heavy Through- Trucks**

### 6.6.3 Freight Ferry Concepts

Similar to the freight railroads, the use of barges for transporting freight could potentially lessen the demand for large trucks, particularly along the Route 440/Routes 1&9T corridor (Figure 6.12).

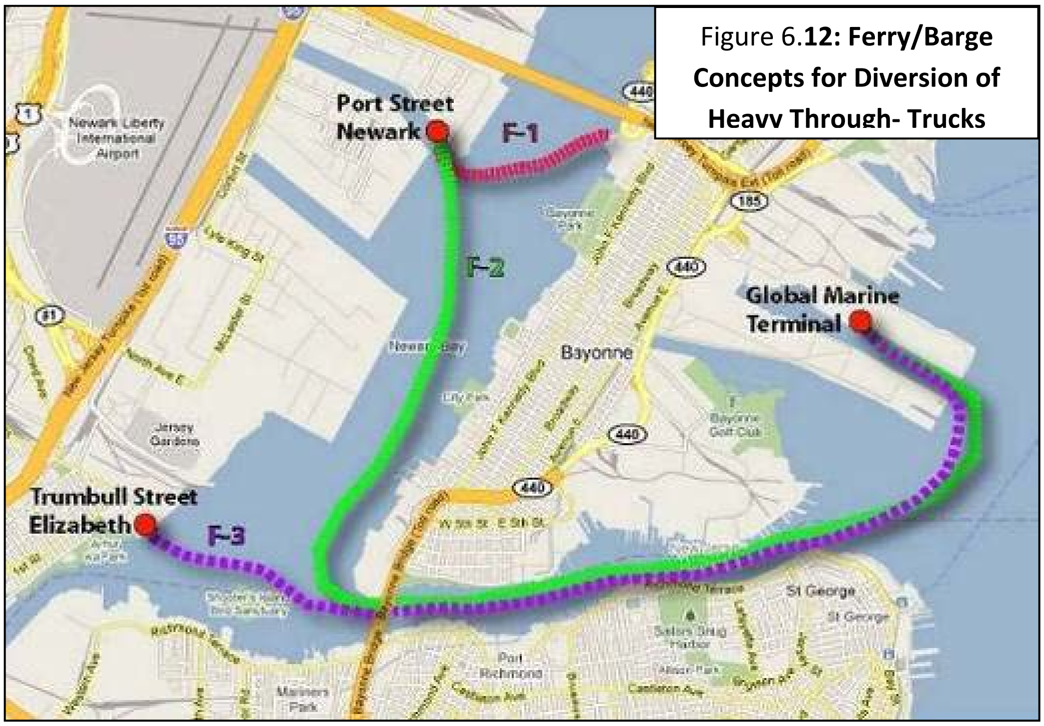



Figure 6.**12: Ferry/Barge Concepts for Diversion of Heavy Through- Trucks**

**F-1:** Create a freight ferry service across the Hackensack River from a location along Route 440 proximate to the City of Bayonne / Jersey City municipal border to Port Street in Newark. Port Street is the primary service roadway to the FAPS auto import and processing facility in Port Newark. Creation of this barge service would require creation of a wharf for the loading/unloading of barges along Newark Bay with access for trucks from Route 440 and landside facilities within Port Newark for the transfer of freight to trucks and railcars.

**F-2:** Create a freight ferry service between Global Marine Terminal/Port Jersey to Port Street in Newark. This would require creation of wharf space within the Global Marine Terminal to accommodate the loading/unloading of barges and landside facilities within Port Newark for the transfer of freight to trucks and railcars.

**F-3:** Create a freight ferry service from Global Marine Terminal/Port Jersey to Trumbull Street in Elizabeth. Norfolk-Southern Railroad operates an intermodal rail yard along Trumbull Street. This would require creation of wharf space within the Global Marine Terminal to accommodate the loading/unloading of barges for transport to Newark for transfer to rail at the Trumbull Street Yard.

**F-4:** Support advancement of the Port Authority of NY/NJ's inland distribution network, and their investigation of potential inland freight rail terminal locations. The PANYNJ recently completed a preliminary investigation of the feasibility of creating one or more inland rail shuttle terminals within 200 miles of the ports. The study resulted in the initiation of nightly rail shuttle service from the port to Harrisburg, PA. The intent would be to transport containers by rail from the ports to these inland locations for local service and delivery as opposed to transporting by truck.

### 6.6.4 Road and Bridge Infrastructure Concepts

Unlike the freight rail and ferry/barge concepts, road and bridge infrastructure concepts are aimed at providing new or enhanced roadway connections between the identified truck origin and destination points. These diversion concepts include operational modifications as well as physical modification. Physical modification concepts range from increasing capacity through expansion of existing infrastructure to the construction of new infrastructure creating routes where none currently exist.

**EASTERN DIVERSIONS –** This set of concepts would provide an alternative travel path for trucks moving between points south and points north (Figure 6.13). Within the corridor, "north" indicates trucks traveling to or from Tonnelle Ave and "south" indicates trucks traveling to or from Bayonne, although the final destination for these trucks may be farther north and south than Tonnelle Avenue and Bayonne.

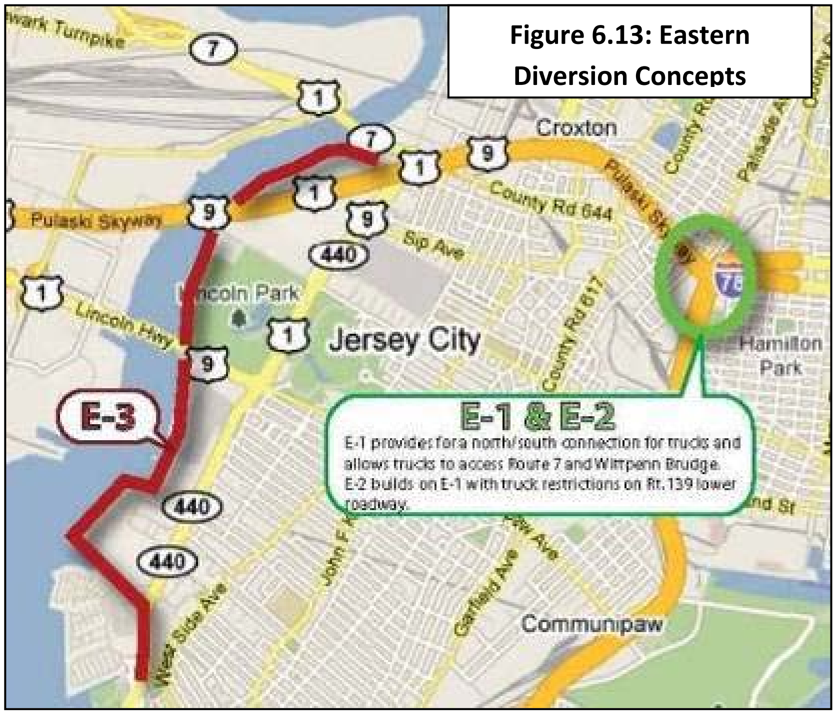



**Figure 6.13: Eastern Diversion Concepts**

**E-1**: Create a direct connection from northern end of the NJ Turnpike (NJTPK) Newark Bay Extension to the lower roadway of NJ Route 139. At the western end of NJ Route 139 connections would be created to Tonnelle Avenue, which is the local gateway to points further north. In addition to providing a north/south connection, this alternative would provide the ability for trucks to access NJ Route 7 and the planned new Wittpenn Bridge. On the western side of the Wittpenn Bridge, trucks would utilize Fish House Road to access Central Avenue and the existing Routes 1&9T in southern Kearny.

**E-2**: Expand alternative E-1, and incorporate an additional connection to the upper roadway for use by automobiles. Trucks would be restricted to the NJ Route 139 lower roadway.

**E-3**: Construct a through-truck diversion roadway along portions of the Hackensack River waterfront between Danforth Avenue and NJ Route 7. Through trucks would be restricted from utilizing the existing Route 440/Routes 1&9T corridor, and would be required to travel along the new roadway

<u>**WESTERN DIVERSION**</u> – This set of concepts would provide an alternative travel path for trucks traveling between points west and southwest (I-78, the Newark/Elizabeth Seaport complex and beyond) and points north (Tonnelle Avenue and beyond) (Figure 6.14). These

alternatives build upon the reconstruction of the Wittpenn Bridge, as well as the potential new crossing of the Passaic River being investigated by NJDOT.


**Figure 6.14: Western Diversion Concepts**

**W-1**: Modify Pulaski Skyway to eliminate safety considerations that led to prohibition of trucks utilizing the Skyway.

**W-2**: Expand upon the NJDOT's on-going rehabilitation of the Pulaski Skyway to include expansion/modification of the infrastructure to incorporate dedicated truck lanes or additional general purpose lanes that would also accommodate trucks.

**W-3**: Create a separate right-of-way or structure parallel to the Pulaski Skyway for use by trucks. The new infrastructure would connect Tonnelle Avenue in Jersey City with Doremus Avenue and the NJ Turnpike Interchange 15-E in the City of Newark.

**W-4**: Construct a new bridge parallel to the NJTPK mainline connecting Doremus Avenue from its northern terminus near NJTPK Interchange 15-E to Route 508/Harrison Avenue/Newark Turnpike. Improvements to Harrison Avenue would be required to better accommodate trucks and access to the Wittpenn Bridge and NJ Route 7. Improvements to Doremus Avenue would be required to eliminate flooding issues and to accommodate an increase in traffic volumes. The existing connections to Lincoln Highway from Doremus Avenue would be maintained. This alternative could build upon and compliment Alternative E-1 provide additional alternatives in regional travel paths.

**W-5**: Improve Interchange of Routes 1&9T with Central Avenue, increase capacity of Central Avenue, Pennsylvania Avenue, Fish House Road and create connection to Route 7. Elements of this concept are already under investigation by the NJDOT as part of the Portway program, and are currently included as one of the Liberty Corridor Phase I Improvements. The elements under consideration focus on reconstruction of Pennsylvania Avenue and Fish House Road to eliminate existing design deficiencies and drainage issues. Alternative W-5 envisions expansion of this alternative to construct additional travel lanes and interchange improvements creating additional capacity for trucks and general traffic along this route.

**SOUTHERN DIVERSION –** This set of concepts (Figure 6.15) would provide an alternative travel path for trucks traveling between points west and southwest (I-78, the Newark/Elizabeth Seaport complex and beyond) and points east and southeast (Bayonne and the Port Jersey Peninsula and beyond).

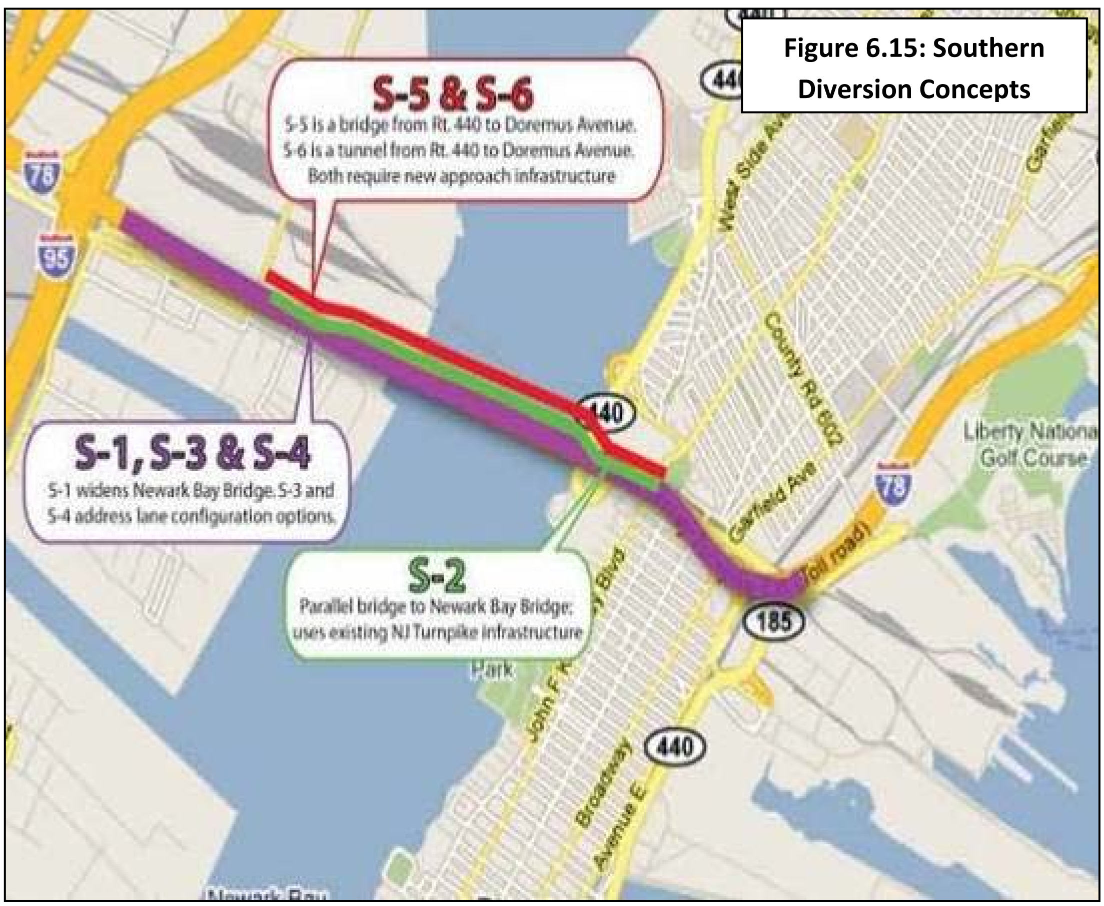



**Figure 6.15: Southern Diversion Concepts**

**S-1**: Widen the existing Casciano Bridge across Newark Bay from 4 to 6 lanes to increase capacity between exits 14 and 14A of the New Jersey Turnpike Hudson Extension.

**S-2**: Construct a second bridge parallel to the existing Casciano Bridge to increase capacity between exits 14 and 14A of the New Jersey Turnpike Hudson Extension. Each bridge would accommodate travel in one direction, with a minimum or three lanes per direction.

**S-3**: Convert the shoulders of existing Casciano Bridge to travel lanes, thereby providing three travel lanes in each direction, to increase capacity between exits 14 and 14A of the New Jersey Turnpike Extension.

**S-4**: Create a reversible center lane on the existing Casciano Bridge, providing three travel lanes in the peak direction depending on time of day (eastbound in the AM, westbound in the PM).

**S-5**: Construct a new bridge across Newark Bay to the north of the existing Casciano Bridge to connect Route 440 from a point in the vicinity of Avenue C in Bayonne to Doremus Avenue in Newark. Two travel lanes would be provided in each direction. Bridge access on the east side of the bay is from Route 440 northbound and to Route 440 southbound. Access from Route 440 southbound and to Route 440 northbound is not provided. Access to the New Jersey Turnpike Extension on the east side of Newark Bay is not provided. Improvements to Doremus Avenue in Newark would be required to eliminate flooding issues and to accommodate an increase in traffic volumes. Additional local roadway improvements in Newark may also be required.

**S-6**: Construct a tunnel under Newark Bay to the north of the Casciano Bridge to connect Route 440 from a point west of Avenue C in Bayonne to Doremus Avenue in Newark. Two travel lanes would be provided in each direction. Tunnel access on the east side of the bay is from Route 440 northbound and to Route 440 southbound. Access from Route 440 southbound and to Route 440 northbound is not provided. Access to the New Jersey Turnpike Extension on the east side of Newark Bay is not provided. Improvements to Doremus Avenue in Newark would be required to eliminate flooding issues and to accommodate an increase in traffic volumes. Additional local roadway improvements in Newark may also be required.

**THROUGH VEHICLE DETERRENTS –** This set of concepts focus on potential regulation and policy measures to discourage or prohibit the use of the Route 440/Routes 1&9T corridor by through trucks that do not have an origin or a destination within the Western Waterfront.

**D-1**: As part of the improvements to the Route 440/Routes 1&9T corridor, create segregated and dedicated through lanes and local lanes along the corridor. Tolling of vehicles utilizing the through lanes would be instituted.

**D-2**: Implement a full prohibition of all through trucks utilizing the Route 440/Routes 1&9T corridor in the Western Waterfront.

**D-3**: Restrict the Route 440/Routes 1&9T corridor for use by bicycles, pedestrians and buses only. All other motorized vehicles (automobiles and trucks) would be prohibited along the corridor.

## 6.7 Corridor Alternatives

The full study corridor extends from Route 7 in the north to the Bayonne border in the South. The central section of the corridor is defined as the portion between Danforth Avenue in the south and Communipaw Avenue in the north. As articulated in the Circulation Element of the Jersey City Master Plan, a majority of the redevelopment within the Western Waterfront of Jersey City is expected to occur adjacent to this section of roadway. Accordingly, this is the section of the corridor where the greatest level of vehicular, bicycle and pedestrian activity is anticipated to occur in the future.

**B-1:** **"No-Build" Alternative -** Under this alternative, no new improvements would be made to the existing roadway corridor. Transportation improvements in the Western Waterfront would be confined to those localized improvements being advanced as part of approved redevelopment plans, including the Bayfront I Redevelopment Plan and the NJCU West Campus Redevelopment Plan, and the potential extension of the HBLR.

**B-2:** **Traditional highway improvement -** Under this alternative, the Route 440/Routes 1&9T corridor would be widened along its existing right-of-way following geometric design criteria similar to the existing roadway. (Figure 6.16)


**Figure 6.16: Traditional Highway Improvement**

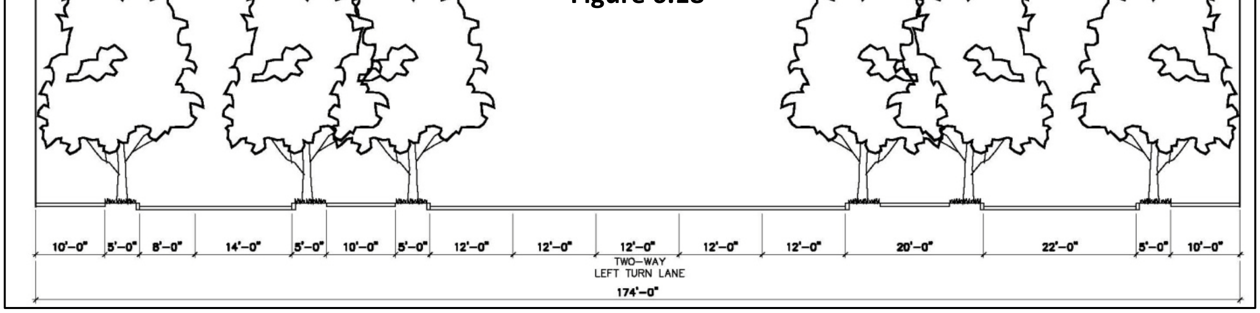
**B-3: New Waterfront Roadway -** Under this alternative, a new roadway would be constructed generally parallel to the existing corridor but along edge of the Hackensack River waterfront (Figure 6.17).


**Figure 6.17: New Waterfront Roadway**

**B-4: At-Grade, Median Divided Boulevard -** Each of these alternatives is applicable to the central section of the corridor from Society Hill Drive to Communipaw Avenue and contemplates creation of an at-grade median divided boulevard roughly paralleling the existing alignment with segregated lanes for through trips (including trucks), local land access trips, bicycle trips and sidewalks for pedestrian trips. A range of boulevard configurations were identified under this alternative with cross-section widths ranging from 174 feet to 276 feet between the set-back/build-to lines on both sides of the corridor. The width required is a function of numerous factors, including the number of travel lanes, number and width of medians, number and width of bicycle lanes, sidewalk width, on-street parking configuration, and whether or not dedicated lanes are to be provided for BRT service.

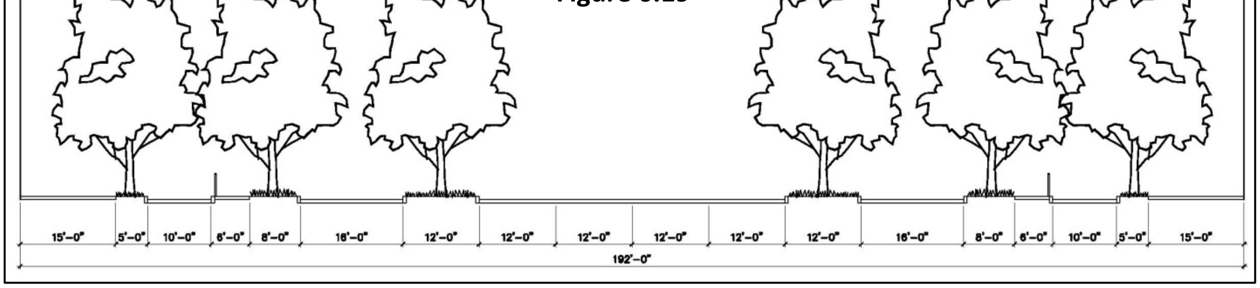
**B-4-1 174-foot wide corridor** - From the centerline, each side of the boulevard would include half of a 12-foot wide shared center left turn lane, two 12-foot wide through travel lanes, a 20-foot wide landscaped median with a 10-foot wide bike path and two 5-foot wide landscape strips, a 14-foot wide frontage road travel lane, an 8-foot wide on-street parking strip, a 5-foot wide landscape strip and a 10-foot sidewalk (Figure 6.18).

**Figure 6.18**




**B-4-2 192-foot wide corridor -** From the centerline, each side of the boulevard would include two 12-foot wide through travel lanes, a 12-foot wide landscaped median with slip lanes providing access to/from a 16-foot wide combination through/frontage road lane, an 8-foot wide on-street parking strip with intermittent landscaping, a 6-foot wide bike lane, a 10-foot wide local frontage road lane, a 5-foot wide landscape strip and a 15-foot wide sidewalk (Figure 6.19).

**Figure 6.19**



**B-4-3 212-foot wide corridor**. The 60-foot wide center median would include an elevated landscape swale, with a meandering bike path. On both sides of this median, the boulevard would include three 12-foot wide through travel lanes, a 2-foot wide offset buffering a 5-foot wide bike lane, an 8-foot wide on-street parking strip, a 10-foot wide landscape strip and a 15-foot sidewalk (Figure 6.20).

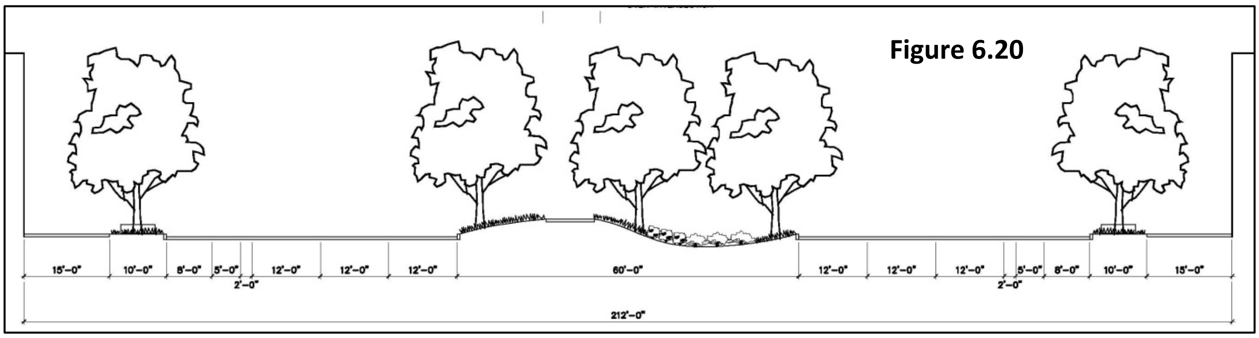
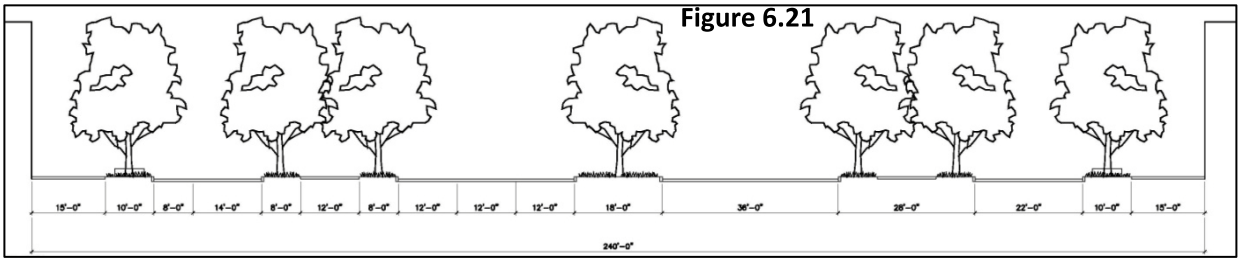



Figure 6.20

**B-4-4 240-foot wide corridor**. The 18-foot wide center median would include dedicated left turn lanes at the signalized through cross-street locations. On each side of the center median, the boulevard would include three 12-foot wide through travel lanes, a 28-foot wide landscaped median with a 12-foot wide bike path and two 8-foot wide landscape strips, a 14-foot wide frontage road travel lane, an 8-foot wide on-street parking strip, a 10-foot wide landscape strip and a 15-foot sidewalk (Figure 6.21).

Figure 6.21



**B-4-5 240-foot wide corridor**. The 64-foot wide center median would include an elevated landscape swale, with a meandering bike path. On both sides of this median, the boulevard would include a 12-foot wide grass shoulder that could potentially be converted to a BRT lane in the future, three 12-foot wide through travel lanes, a 2-foot wide offset buffering a 5-foot wide bike lane, an 8-foot wide on-street parking strip, a 10-foot wide landscape strip and a 15-foot sidewalk (Figure 6.22).

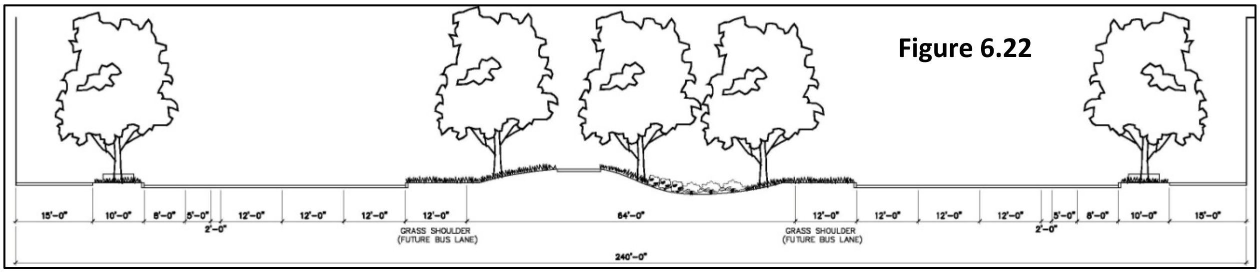



**Figure 6.22**

**B-4-6 240-foot wide corridor**. The 44-foot wide center median/transit area would include a 20-foot wide landscaped area incorporating bus shelters to be served by two adjacent 12-foor wide dedicated bus lanes (one in each direction). On each side of the center median, the boulevard would include three 12-foot wide through travel lanes, a 20-foot wide landscaped median with a 10-foot wide bike path and two 5-foot wide landscape strips, a 12-foot wide frontage road travel lane, an 8-foot wide on-street parking strip, a 10-foot wide landscape strip and a 12-foot sidewalk (Figure 6.23).

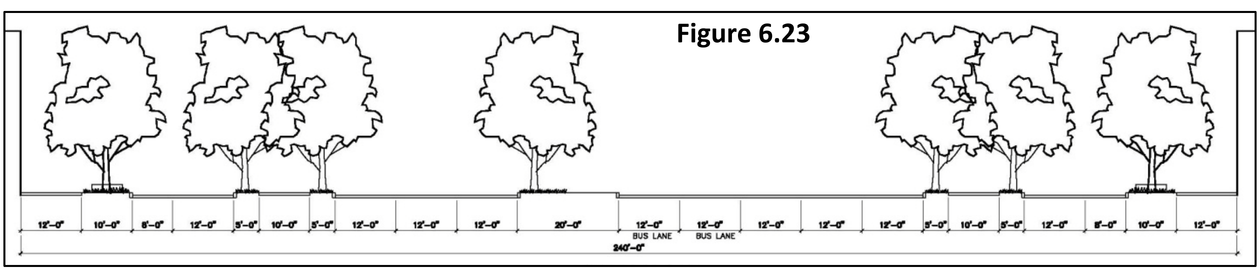



**Figure 6.23**

**B-4-7 240-foot wide corridor**. The 8-foot wide center median would separate northbound and southbound travel lanes. On each side of the center median, the boulevard would include two 12-foot wide through travel lanes, a 24-foot wide landscaped median with bus shelters and periodic slip lanes providing access between the through lanes and two 12-foot wide frontage road lanes, an 8-foot wide on-street parking lane with intermittent landscaping and a 6-foot wide sidewalk, a 10-foot wide bike lane, a 5-foot wide landscape strip and a 15-foot sidewalk (Figure 6.24).

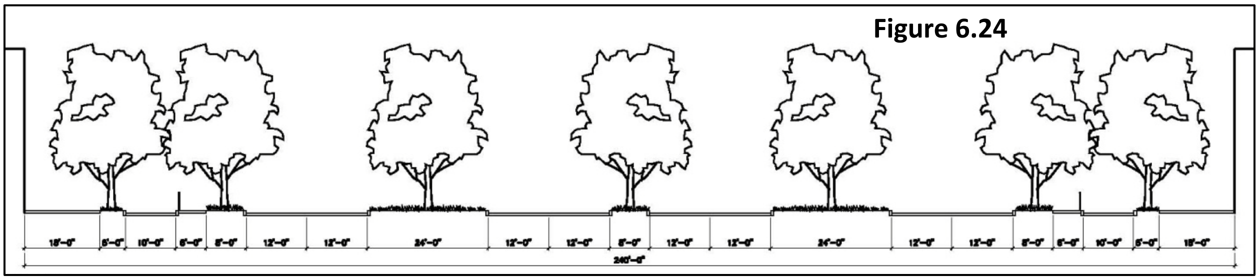


**Figure 6.24**

**B-4-8 240-foot wide corridor**. The 12-foot wide center median would separate northbound and southbound travel lanes, with the median area utilized for left turn lanes at major signalized cross streets. Each side of the boulevard would include two 12-foot wide through travel lanes, followed by a mixed use median area of 30 feet in one direction and 26 feet in the opposite direction. The 30-foot wide median area would house landscaping bus shelters and bus layby areas. Adjacent to this median would be an 8-foot wide on-street parking lane. The 26-foot wide median would house landscaping, and angled on-street parking spaces accessed from the frontage road through lanes. Each frontage road would include two 12-foot wide local travel lanes, an 8-foot wide mezzanine style bike lane, a 5-foot wide landscape strip and a 15-foot wide sidewalk (Figure 6.25).

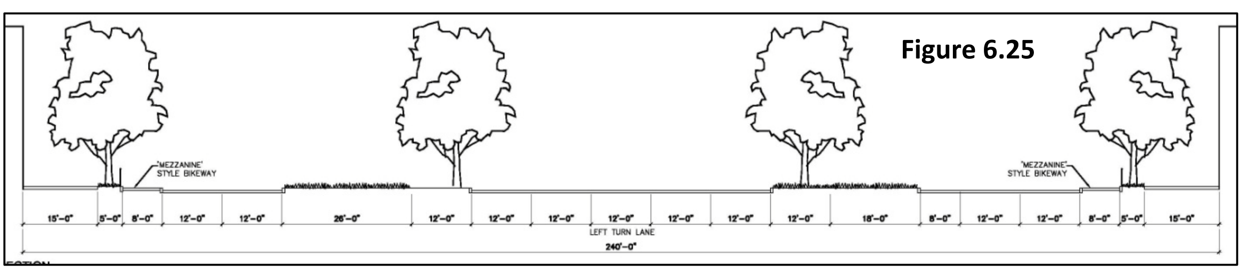
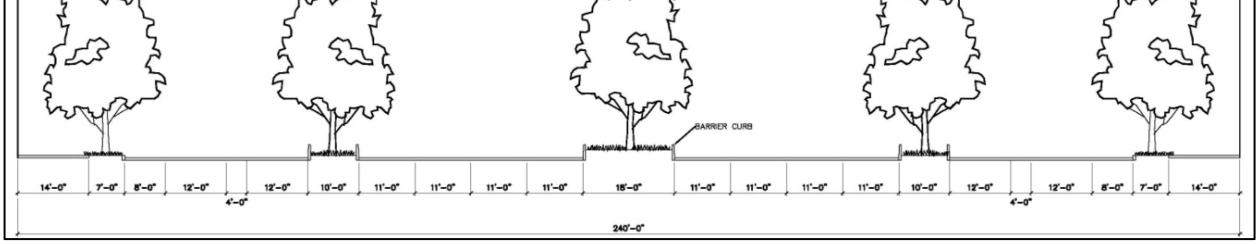



**Figure 6.25**

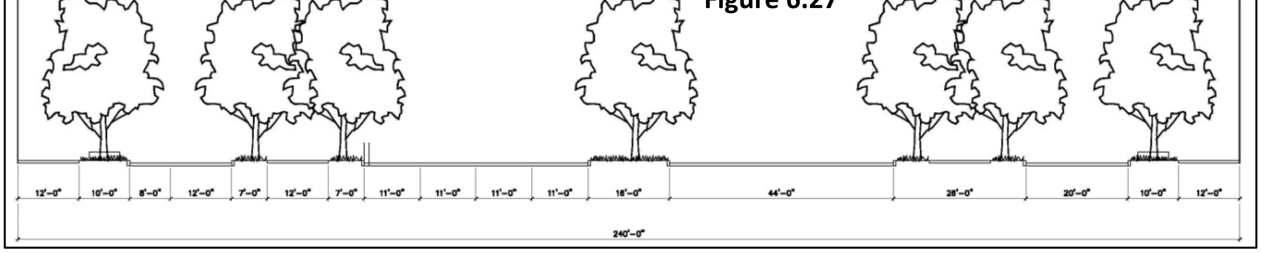
**B-4-9 240-foot wide corridor**. The 18-foot wide center median would include dedicated left turn lanes at the signalized through cross-street locations. On each side of the center median, the boulevard would include three 11-foot wide through travel lanes, one 11-foot wide BRT lane, a 10-foot wide landscaped median, a 12-foot wide two-directional mezzanine bike path, a 5-foot buffer strip, an 11-foot wide frontage road travel lane, an 8-foot wide on-street parking strip, a 7-foot wide landscape/amenities strip and a 14-foot sidewalk. (Figure 6.26).

**Figure 6.26**




**B-4-10 240-foot wide corridor**. The 16-foot wide center median would include dedicated left turn lanes at the signalized through cross-street locations. On each side of the center median, the boulevard would include four 11-foot wide through travel lanes, a 26-foot wide landscaped median with a 12-foot wide bike path and two 7-foot wide landscape strips, a 12-foot wide frontage road travel lane, an 8-foot wide on-street parking strip, a 10-foot wide landscape strip and a 12-foot sidewalk. (Figure 6.27).

**Figure 6.27**



**B-4-11 240-foot wide corridor**. The 58-foot wide center median would include an elevated landscape swale, with a meandering bike path. On both sides of this median, the boulevard would include a 12-foot wide grass shoulder, four 11-foot wide through travel lanes, a 2-foot wide offset buffering a 5-foot wide bike lane, an 8-foot wide on-street parking strip, a 5-foot wide landscape strip and a 15-foot sidewalk (Figure 6.28).

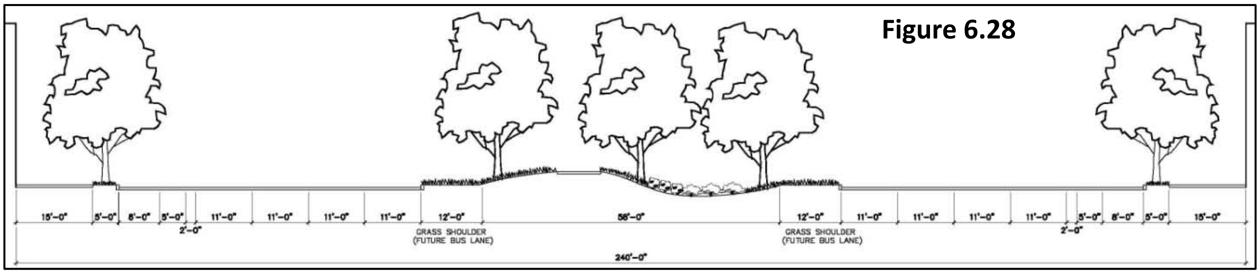


**Figure 6.28**

**B-4-12 240-foot wide corridor**. The 44-foot wide center median/transit area would include an 18-foot wide landscaped area incorporating bus shelters to be served by two adjacent 11-foor wide dedicated bus lanes (one in each direction). On each side of the center median, the boulevard would include three 11-foot wide through travel lanes, a 20-foot wide landscaped median comprised of a 10-foot wide bike path and two 5-foot wide landscape strips, two 11-foot wide frontage road travel lane, an 8-foot wide on-street parking strip, a 5-foot wide landscape strip and a 12-foot sidewalk (Figure 6.29).

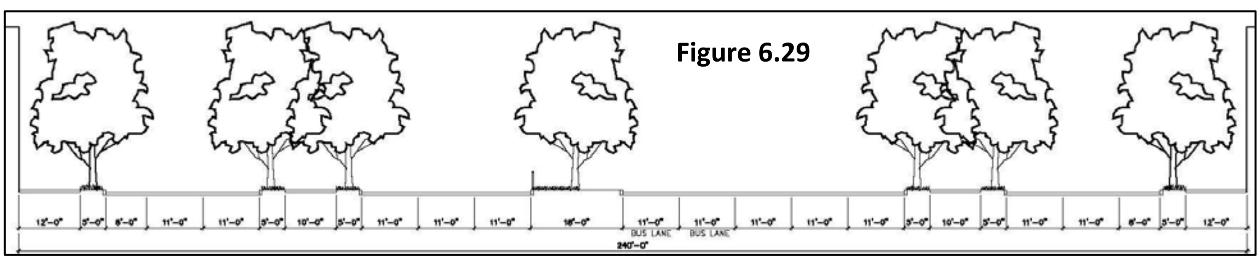
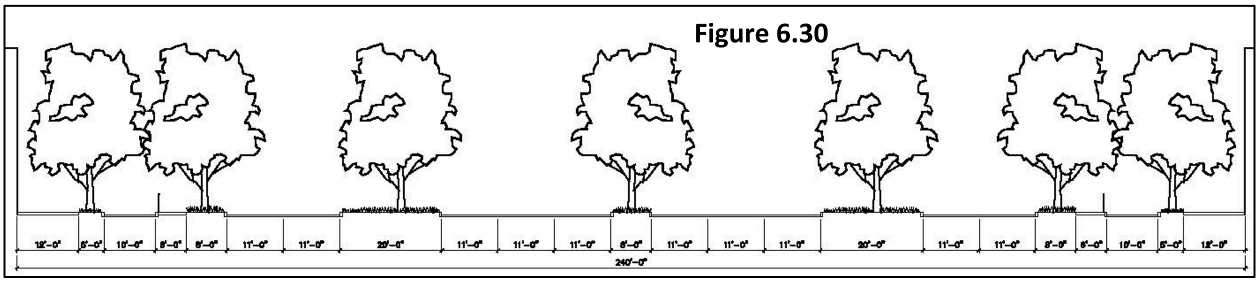


**Figure 6.29**

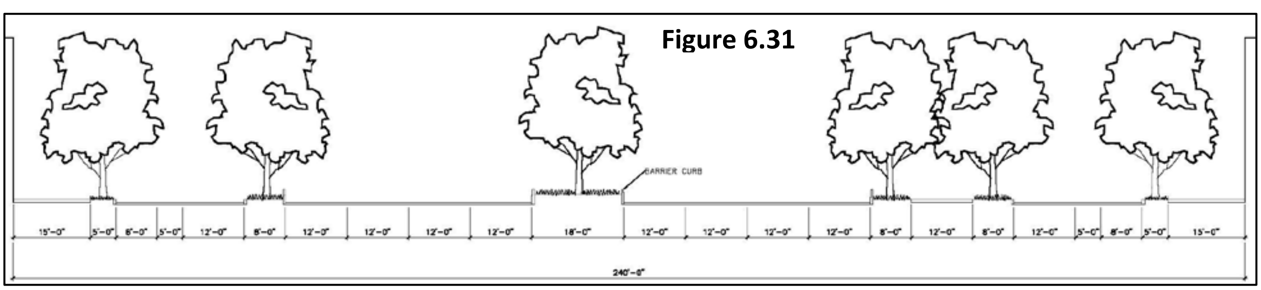
**B-4-13 240-foot wide corridor**. The 8-foot wide center median would separate northbound and southbound travel lanes. On each side of the center median, the boulevard would include three 11-foot wide through travel lanes, a 20-foot wide landscaped median with bus shelters and periodic slip lanes providing access between the through lanes and two 11-foot wide frontage road lanes, an 8-foot wide on-street parking lane with intermittent landscaping and a 5-foot wide sidewalk, a 10-foot wide bike lane, a 5-foot wide landscape strip and a 12-foot sidewalk (Figure 6.30).

Figure 6.30



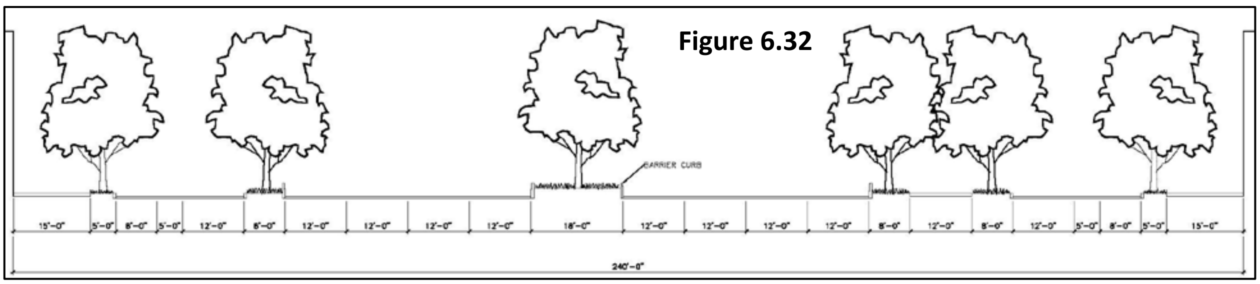

**B-4-14 240-foot wide corridor**. The 18-foot wide center median would separate northbound and southbound travel lanes and accommodate left turn lanes at major signalized cross streets. On each side of the center median, the boulevard would include four 12-foot wide through travel lanes. On the northbound side, the through lanes would be abutted by a 28-foot wide landscaped median with a "canal bikeway" located on top of the former Morris Canal footprint, followed by a 12-foot local travel lane, a 5-foot wide in-street bike lane, an 8-foot wide on-street parking lane, a 5-foot wide landscape strip and a 15-foot wide sidewalk. On the southbound side, the through lanes would be abutted by an 8-foot wide landscaped median, a 12-foot local travel lane, a 5-foot wide in-street bike lane, an 8-foot wide on-street parking lane, a 5-foot wide landscape strip and a 15-foot wide sidewalk (Figure 6.31).

Figure 6.31



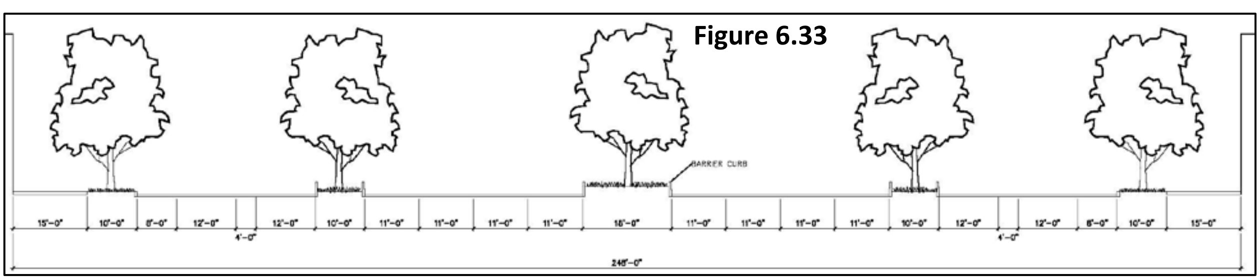
**B-4-15 240-foot wide corridor**. The 20-foot wide center median would separate northbound and southbound travel lanes and accommodate left turn lanes at major signalized cross streets. On each side of the center median, the boulevard would include four 11-foot wide through travel lanes. On the northbound side, the through lanes would be abutted by a 12-foot wide two-directional bike lane and a 12-foot wide "canal walk" located on top of the former Morris Canal footprint, followed by a 11-foot local travel lane, an 8-foot wide on-street parking lane, a 10-foot wide landscape strip and a 19-foot wide sidewalk. On the southbound side, the through lanes would be abutted by a 12-foot wide two-directional bike lane, an 11-foot local travel lane, an 8-foot wide on-street parking lane, a 10-foot wide landscape strip and a 19-foot wide sidewalk (Figure 6.32).

**Figure 6.32**




**B-4-16 248-foot wide corridor**. The 18-foot wide center median would include dedicated left turn lanes at the signalized through cross-street locations. On each side of the center median, the boulevard would include four 11-foot wide through travel lanes, a 10-foot wide landscaped median, a 12-foot wide bike path, a 4-foot wide painted buffer, a 12-foot wide frontage road travel lane, an 8-foot wide on-street parking strip, a 10-foot wide landscape strip and a 15-foot sidewalk. (Figure 6.33)

**Figure 6.33**



**B-4-17 232-foot wide corridor.** The 18-foot wide center median would include dedicated left turn lanes at the signalized through cross-street locations. On each side of the center median, the boulevard would include three 11-foot wide through travel lanes, one 11-foot wide BRT lane, a 10-foot wide landscaped median, a 12-foot wide two-directional mezzanine bike path, a 4-foot buffer strip, an 11-foot wide frontage road travel lane, an 8-foot wide on-street parking strip, a 6-foot wide landscape/amenities strip and a 12-foot sidewalk (Figure 6.34).

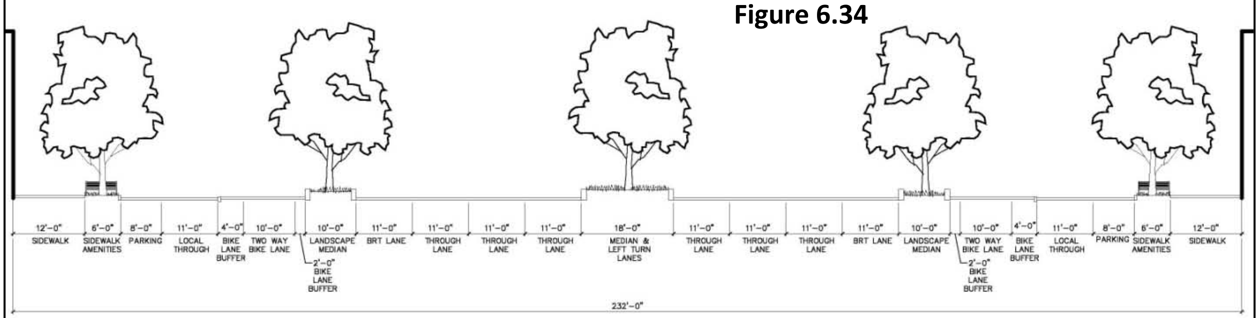


**Figure 6.34**

**B-5**: Create separate rights-of-way for northbound and southbound traffic separated by development blocks (Figure 6.35). The roadway that accommodates northbound travel would be constructed roughly along the existing corridor alignment, and the southbound travel roadway would be constructed in a location west of the current corridor alignment. The two one-way roadways would be physically separated by a distance suitable for the creation of development parcels between the roadway segments, similar to the configuration of the north/south avenues and numbered cross streets in midtown Manhattan, New York.

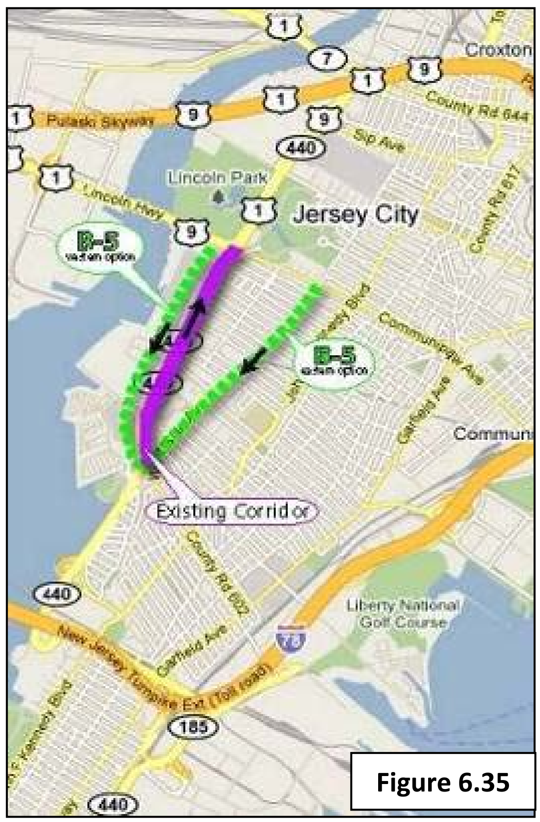


**Figure 6.35**

**B-6:** Reconstruct the existing highway as a through roadway with limited local access and intersections connecting with the local street network in the Western Waterfront. Local access and circulation would be accommodated through construction of a waterfront roadway. Selected east/west streets would intersect with Route 440/Routes 1&9T at-grade, or could be elevated to provide grade-separated crossing of Route 440/Routes 1&9T without connections to the north/south through lanes. (Figure 6.36)


**Figure 6.36**

**B-7:** As opposed to an at-grade boulevard, reconstruct the existing roadbed and travel lanes at their current location and elevation, and create elevated frontage roads to accommodate local circulation and access to neighborhoods and development adjacent to the corridor. It is envisioned that the elevation of the land adjacent to the corridor would be elevated so that future development would integrate with the elevated frontage roads and sidewalks. East/west crossings of the corridor would be provided via bridges over the center through lanes (Figure 6.37).

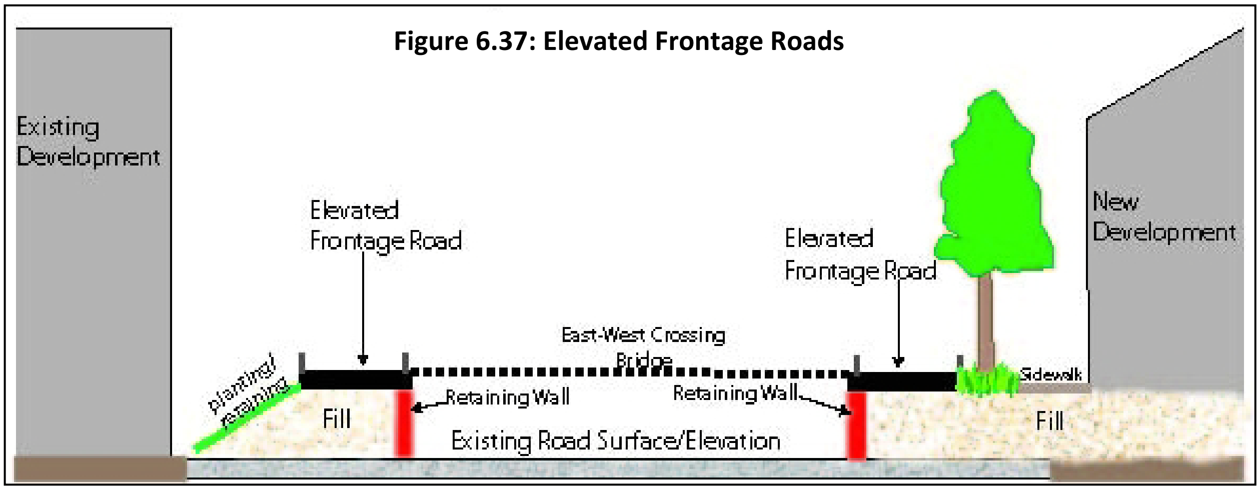



**Figure 6.37: Elevated Frontage Roads**

**B-8:** As an alternative to creating elevated frontage roads, create a depressed corridor of travel lanes to segregate and accommodate through traffic, with frontage roads constructed at the existing roadway elevation to accommodate local circulation and neighborhood access. East/west crossings of the corridor would be provided via bridges over the center through lanes (Figure 6.38).

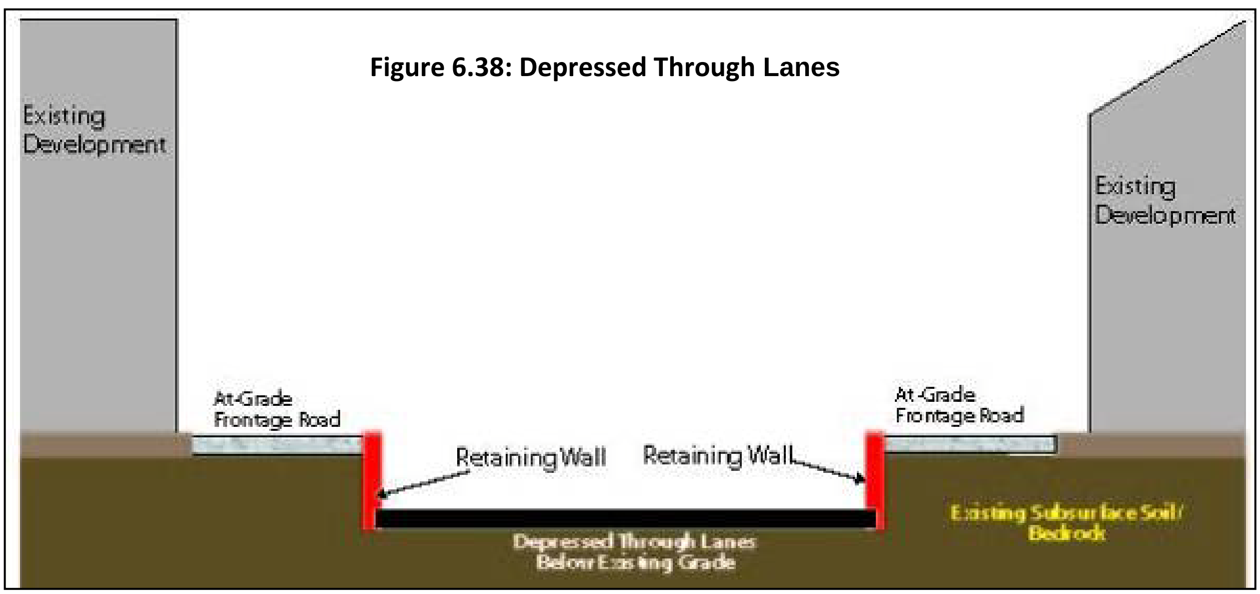
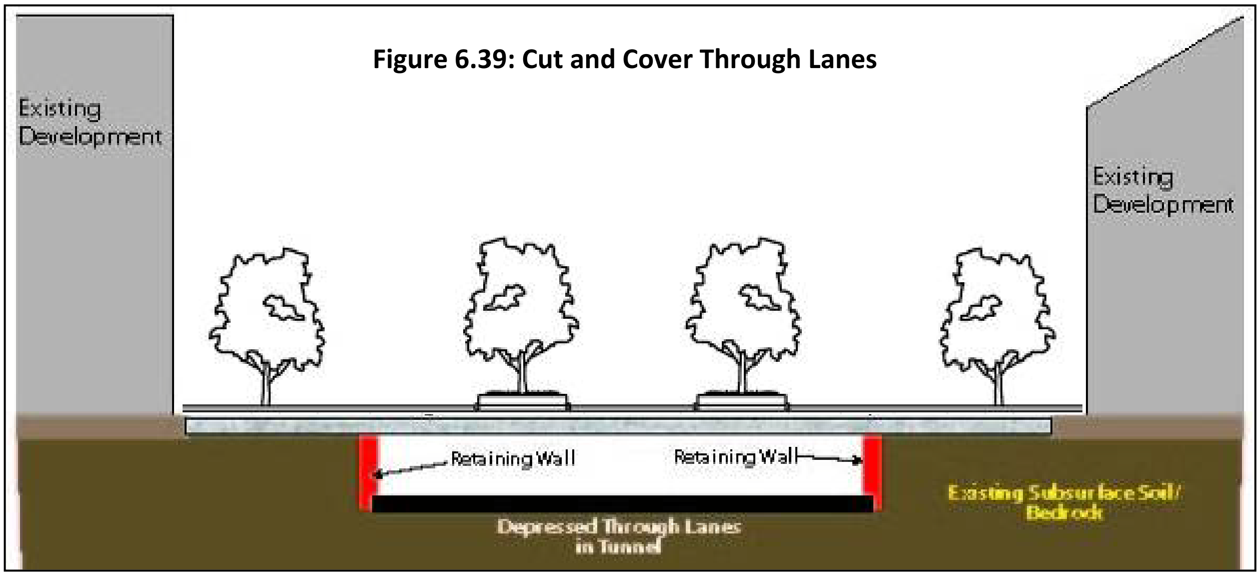



**Figure 6.38: Depressed Through Lanes**

**B-9**: This alternative builds upon Alternative B-8. The depressed through travel lanes would be capped creating a "Cut and Cover" tunnel for through vehicles along the corridor alignment (Figure 6.39). The space above the tunnel would be developed for local traffic only, incorporating pedestrian and bicycle paths, bus lanes and extensive landscaping.

**Figure 6.39: Cut and Cover Through Lanes**

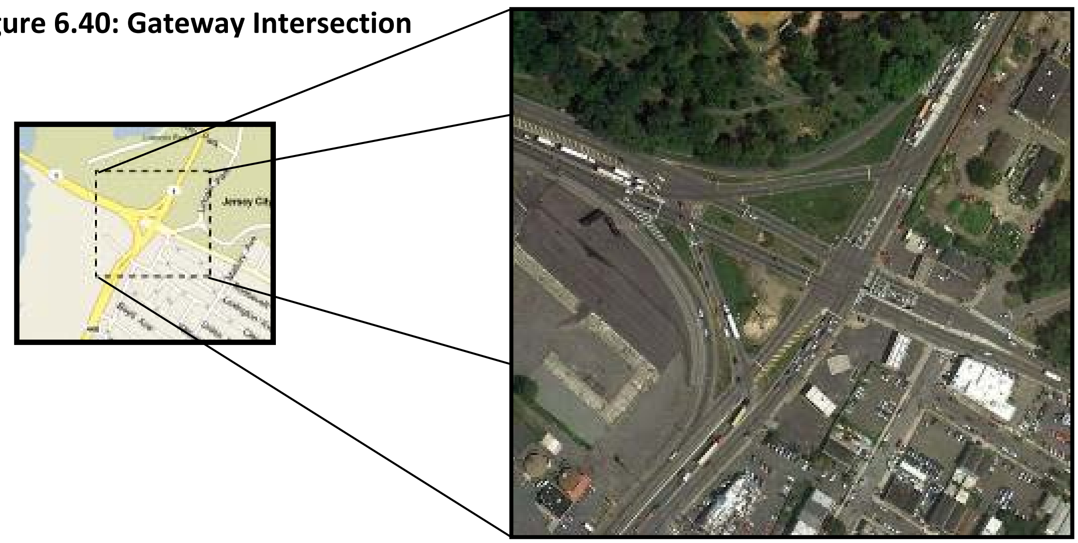



The surface elements of this alternative are constructed within a 188 foot wide cross section and include a 18-foot wide two-way bike path running along the center of the roadway. This bike path is abutted on both sides by a 12-foot wide landscape buffer strip which provides space for BRT stations servicing the 11-foot wide dedicated BRT lanes in both directions along the corridor. The BRT lanes are separated from two 11-foot wide local travel lanes in each direction by an eight foot wide paved amenity strip. The outer edges of the corridor include an eight foot wide on-street parking lane, an eight foot wide sidewalk amenity strip with ornamental trees and a 16-foot wide sidewalk.

## 6.8 Gateway Intersection Alternatives

The intersection of Route 440 / Routes 1&9T / Lincoln Highway and Communipaw Avenue represents a gateway to the Western Waterfront and is a critical focal point of the study area roadway network. Treatment of this intersection and the efficiency of the resulting traffic operations, as well as walkability and bicycle accessibility to, from and through this intersection will have a significant effect on overall study area traffic operations. A range of improvement concepts were developed and evaluated to determine the extent to which they would meet the goals and objectives established for this study.

**Figure 6.40: Gateway Intersection**



**C-1:** Consolidate the existing intersection into a single traffic signal controlled intersection. This alternative seeks to minimize the space required for roadway improvements, freeing up land adjacent to the intersection for future development. This alternative may be viewed as a consolidation of the current intersection configuration and multiple traffic signals into a single signalized intersection accommodating all through, left and right turn movements (Figure 6.41).

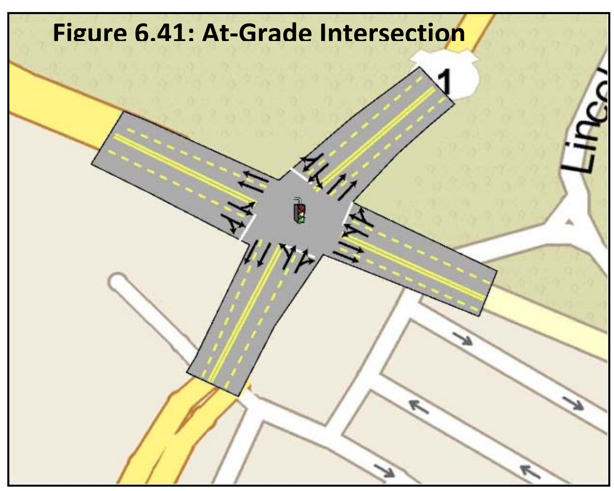
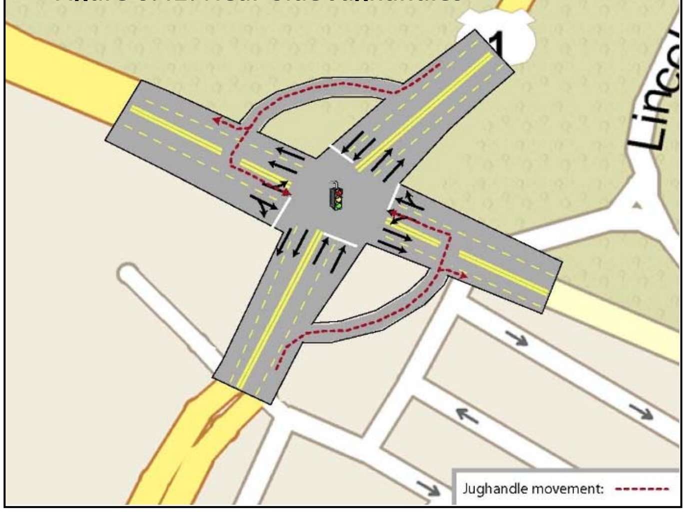


**Figure 6.41: At-Grade Intersection**

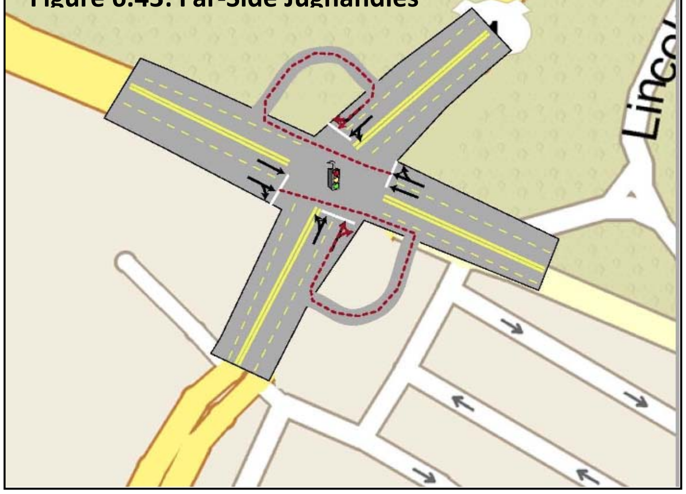
**C-2:** Consolidate the current intersection configuration and multiple traffic signals into a single signalized intersection. This alternative is a modification of Alternative C-1 in that the northbound and southbound left turn movements would be accommodated by near-side jughandles as opposed to dedicated left turn lanes at the traffic signal. This option would require three (3) separate traffic signals operating from a single controller (Figure 6.42).

**Figure 6.42: Near-Side Jughandles**




**C-3:** As a modification of Alternative C-2, construct a single traffic signal controlled intersection, with the eastbound and westbound left turn movements be accommodated by far-side jughandles. This modification would eliminate the need for separate traffic signals to control the left turning movements (Figure 6.43).

**Figure 6.43: Far-Side Jughandles**



**C-4:** Construct a traditional Single Point Urban Interchange (SPUI). The SPUI incorporates a grade-separated bridge to accommodate northbound and southbound through movements. All eastbound and westbound movements and the northbound and southbound left and right turn movements would be accommodated at a single intersection beneath the bridge. Right turns would be accommodated by channelized right turn lanes merging with the main roadways at a merge condition. Left turns would be accommodated in channelized lanes controlled by the traffic signal beneath the bridge (Figure 6.44).

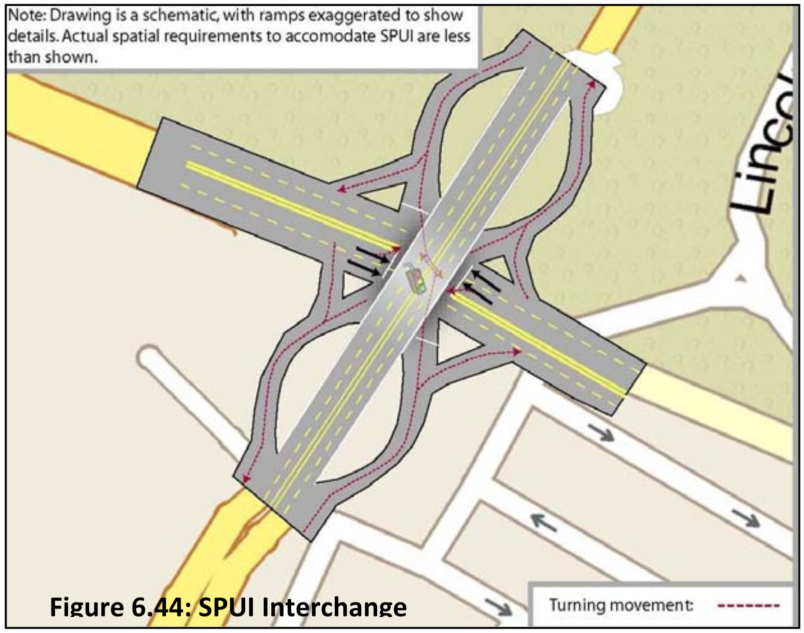


**Figure 6.44: SPUI Interchange**

**C-5:** As a modification of Alternative C-4, as opposed to a bridge accommodating the northbound and southbound through movements, a tunnel would be constructed. Turning movements would be configured the same as described above for Alternative C-4 (Figure 6.45).

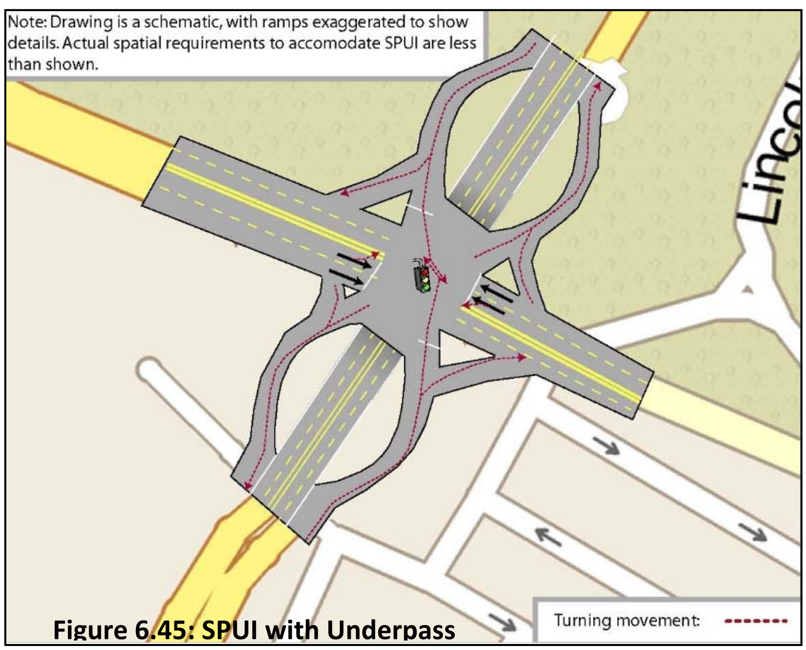


**Figure 6.45: SPUI with Underpass**

**C-6:** Construction of an at-grade Traffic Circle[2]. Under this alternative, all movements through the intersection would be accommodated by a multi-lane at-grade traffic circle. The central space created within the traffic circle would be utilized for the creation of a public space (Figure 6.46).

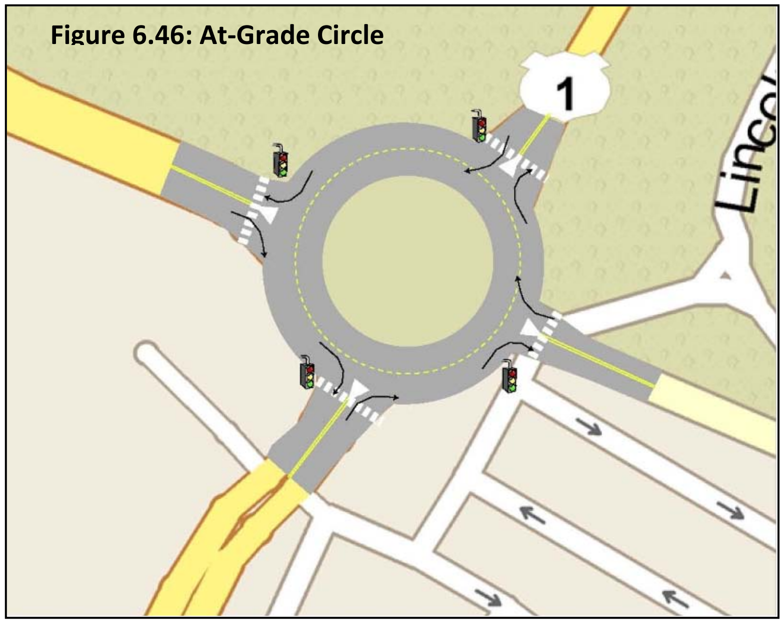



Figure 6.46: At-Grade Circle

**C-7:** As a modification of Alternative C-6, this concept envisions construction of an at-grade traffic circle with the addition of a tunnel accommodating both the northbound and the southbound through movements. The at-grade traffic circle would accommodate all eastbound and westbound movements as well as northbound and southbound turning movements. The central space of the traffic circle would be utilized for the creation of a public space (Figure 6.47).

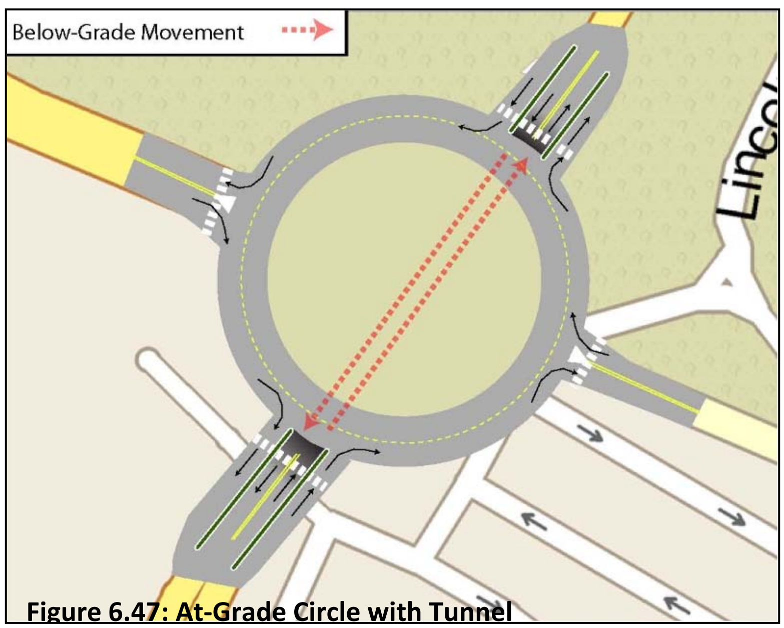



Figure 6.47: At-Grade Circle with Tunnel

[2] Traffic Circle is used for these alternatives because at least one traffic signal is proposed. Round-abouts do not use traffic signals.

**C-8**: As a modification of alternative C-7, instead of a tunnel beneath the traffic circle, northbound and southbound movements would be accommodated by a flyover passing over the circle. Aside from this modification of northbound and southbound movement accommodation, all other aspects of the concept would be identical to Alternative C-7 (Figure 6.48).

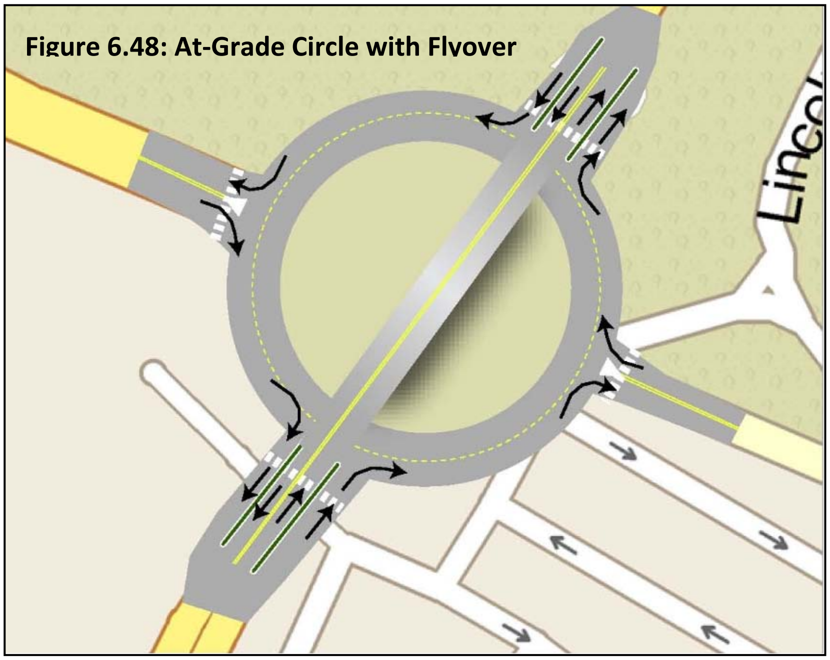



**Figure 6.48: At-Grade Circle with Flyover**

**C-9:** This alternative is a further modification of alternative C-7, with both the East/West and North/South through movements accommodated in tunnels constructed beneath the at-grade circle. The through movements would be controlled by a traffic signal. All left turn movements would be accommodated within the at-grade circle. Channelized right turn lanes would be constructed provided at-grade, but segregated from the circle (Figure 6.49).

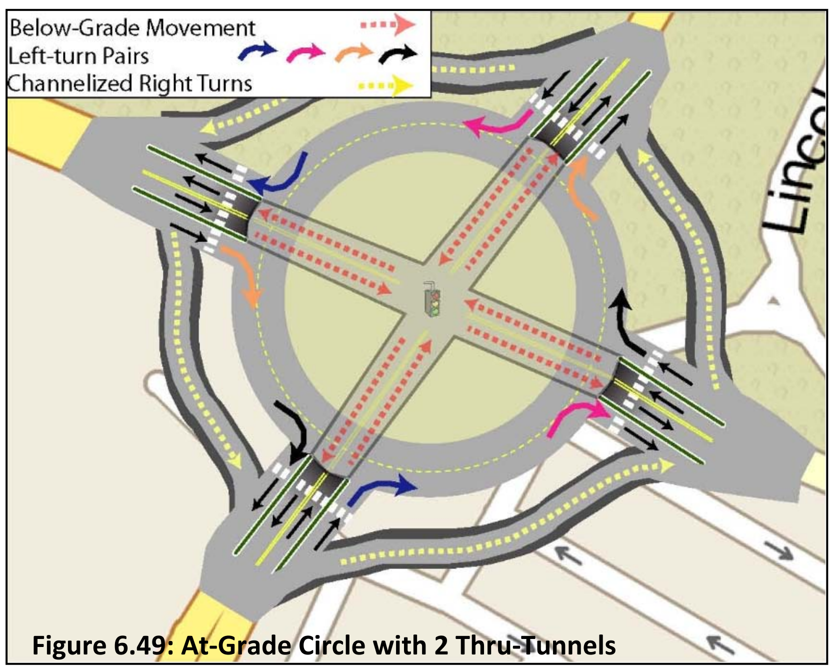



**Figure 6.49: At-Grade Circle with 2 Thru-Tunnels**

**C-9-A:** As a further refinement to Alternative C-9, this alternative would accommodate the right turn movements at the signalized intersection of the north/south and east/west tunnels. The at-grade circle would accommodate all left turn movements, with the interior of the circle reserved for the creation of a public space. (Figure 6.50).

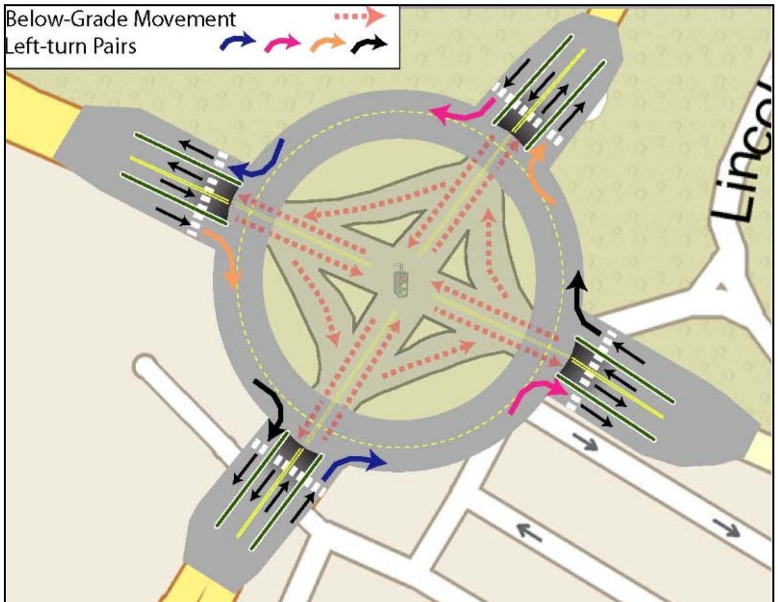



Figure 6.50: At-Grade Circle with Thru and Right Turn

**C-9-B:** This option is a modification of Alternative C-9-A in that the intersection for through and right turning movements is constructed at-grade, with the circle constructed on an elevated platform above the intersection to accommodate left turn movements. Adjoining land developments would meet the public right of way at the elevated platform level (Figure 6.51).

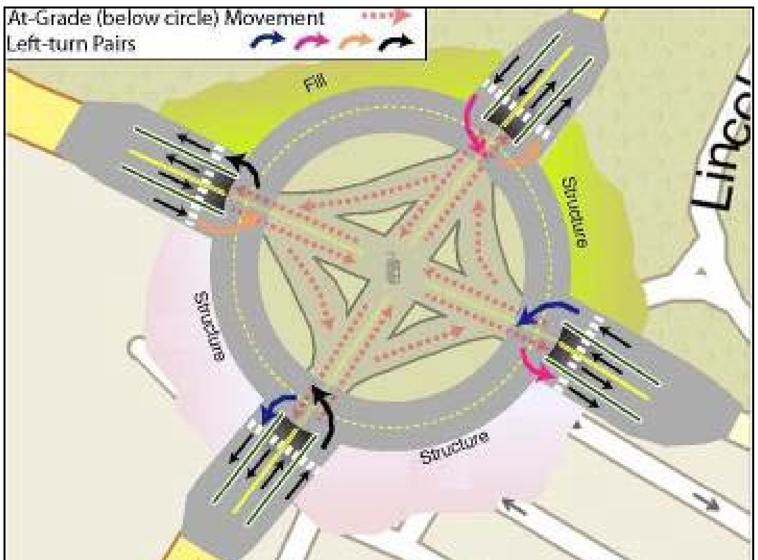



Figure 6.51: At-Grade Intersection with Elevated Circle

**C-10:** This alternative is a variation of Alternative C-9-B in that the circle would be designed to accommodate clockwise traffic flow as opposed to the traditional counterclockwise flow. The circle would accommodate all left turn movements, but the reverse flow would require turning vehicles to only travel around one quarter of the circle as opposed to traveling three quarters of the way around. The intersections of the local roadways as they join the circle would be controlled by traffic signals that would also accommodate bicycle and pedestrian crossings into the center of the circle (Figure 6.52).

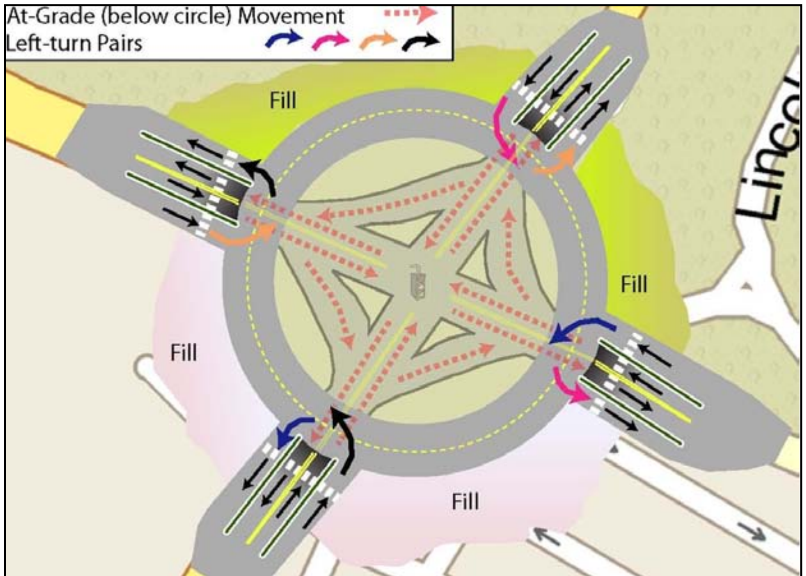



**Figure 6.52: At-Grade Intersection with Elevated Circle – Reverse Travel Direction**

## 6.9 Evaluation of Alternatives

The alternatives identified above were the culmination of a process involving the input, ideas and efforts of the project team, the Technical Advisory Committee, the NJDOT Core Group Subject Matter Experts, project stakeholders and the general public. The intent of this collaborative effort was to ensure that the varying perspectives and interests of the study participants were incorporated in the identification of a wide array of alternative solutions for further analysis.

The alternatives described above were organized into three primary categories - Through Truck Diversion, Corridor Alternatives and Gateway Intersection Alternatives. However, these alternatives should not strictly be viewed as standalone options. The Locally Preferred Alternative (LPA) may consist of a combination of possible alternatives that best address the project purpose and need, and goals and objectives. An evaluation of alternatives is provided in Chapter 7, Alternatives Assessment.