



## 7. ALTERNATIVES ASSESSMENT

As discussed in chapter 6, a wide range of concept alternatives was developed to address the issues and goals identified by the purpose and need statement. Alternatives were developed and organized into three categories: through truck diversion alternatives, corridor alternatives, and central intersection (the intersection of Route 440/Routes 1&9T/Communipaw Avenue) alternatives. A two-tiered evaluation process was developed and applied to identify a single preferred alternative under the corridor and central intersection categories. One preliminary preferred alternative was identified, and ranks higher than three other potential preferred alternatives for the through truck diversion category. The through truck diversion preferred alternatives will require additional conceptual design and further analysis subsequent to the conclusion of this study.

The evaluation process was developed and applied in accordance with FHWA guidance<sup>1</sup> which states that alternatives can be omitted from detailed analysis of alternatives because they are not reasonable or feasible, or do not meet the proposed project's stated purpose and need. While there is no standard methodology for such screening, it is recommended that a systematic process be employed that eliminates alternatives that cannot meet the Project Purpose and Need; would result in significant environmental impacts; and are not technically or economically feasible. This screening process also serves as a preliminary environmental screening, with a more detailed study to be conducted as part of an environmental impact statement as one or more of the locally preferred alternatives are advanced.

### 7.1 Alternative Evaluation Methodology

The first phase of the evaluation, Tier I – Supportive and Not Detrimental Outcome Screening, was designed to eliminate from further consideration any alternative that does not meet the defined project purpose and need (chapter 1), results in significant environmental impacts or is not technically feasible to construct. The second phase of the evaluation, Tier II – Detailed Evaluation and Alternative Scoring, was designed to quantify a range of performance measures and prioritize the remaining alternatives within each of the three categories to select the preferred alternatives. Prioritization identified the alternatives that best address the project

---

<sup>1</sup> Federal Highway Administration, Office of the Chief Counsel, Alternatives Analyses White Paper, September 22, 2010



purpose and need, and support additional project goals and objectives, including those of the Circulation Element of the Jersey City Master Plan (chapter 1).

### **7.1.1 Tier I – Supportive and Not Detrimental Outcome Screening**

The Tier I – Supportive and Not Detrimental Outcome Screening process took a “fatal flaw” approach, wherein a wide range of screening criteria were applied to each alternative. The Tier I criteria were developed by the project team in consultation with the Technical Advisory Committee. The assessment and scoring of each alternative was conducted by the project team. The Tier I criteria included both qualitative and quantitative measures intended to screen out alternatives that are not technically feasible or do not serve the project purpose and need without resulting in significant adverse impacts or supportive and not detrimental outcomes. Criteria varied by category; however, impact to vehicular mobility and environmental impacts were evaluated for all alternatives in all three categories. Concept alternatives that failed on the basis of even one criterion were removed from further consideration; however, most alternatives that were screened out failed on the basis of two or more criteria. All surviving alternatives were advanced to Tier II for a more detailed analysis and ranking.

### **7.1.2 Tier II – Detailed Evaluation and Ranking**

The Tier II evaluation process took a detailed look at each concept alternative that passed the Tier I screening. The Tier II criteria were developed by the project team in consultation with the Technical Advisory Committee, and were comprised of a mix of quantitative and qualitative performance measures categorized by goal. All goals and criteria were assigned weighting factors and numeric maximum weighted scores. Alternatives were then evaluated and scored within each of the three categories of through truck diversion alternatives, corridor alternatives, and gateway intersection alternatives. Based upon the resulting weighted scores, the concept alternatives were ranked for selection of the locally preferred alternative(s) for each category.

It should be noted that as originally developed, the Tier II scoring model produced a comparison of the alternatives that were passed through the Tier I screening process to quantify the relative benefits of each competing alternative. As the No-Build alternatives do not serve the goals and objectives of this study as defined in the purpose and need statement, they were not advanced past the Tier I screening analysis, except for purposes of serving as a baseline for measurement of improvements provided by the build alternatives that advanced to Tier II. The no-build baseline was applied at the time of measurement for criteria that measured change, and at the time of scoring for criteria that measured absolute value. Items that performed at the level of the baseline received a score of zero.



Scores were weighted. Weighting factors were determined by the TAC through a consensus based process by which each participating TAC member proposed a complete set of weighting factors for all goals and criteria, and the averages of members' proposed weights were assigned for each goal and criterion. In this way, the varied expertise of each participating TAC member and concerns of his or her particular agency were considered in the determination of the weighting of the Tier II evaluation criteria.<sup>2</sup> This broad expert input ensured the selection of preferred alternatives that provide the greatest benefit in the most important areas in the context of the study goals and objectives.<sup>3</sup>

The first step in the process was the establishment of a range of goal categories. Goal categories were defined to reflect the defined purpose and need of the study as well as the overarching goals and objectives set forth in the Circulation Element of the Jersey City Master Plan. The goal categories that were applied to one or more of the categories of alternatives consisted of:

- Regional and Local Traffic Flow
- Through Truck Diversion
- Conformance with New Jersey Complete Streets Policy
- Pedestrian and Bicycle Safety
- Environmental Impacts
- Environmental Justice
- Support for Livability
- Public Transit Implications
- Leveraging / Building Upon Other Planned Improvements
- Constructability

It is recognized that not all goals are equally important. In consultation with the Technical Advisory Committee (TAC), the relative importance of each Goal was quantified. Each public agency on the TAC was asked to provide input to determine the relative importance or

---

<sup>2</sup> Only those TAC members who represented public agencies participated in the weighting process, and two public agencies chose not to participate.

<sup>3</sup> The process was patterned after a decision making process developed by the North Jersey Transportation Planning Authority to establish weighting factors for prioritizing transportation projects.



“weight” for application to each established goal category. Where multiple divisions of an agency were represented, each division was asked to provide input. Weights were expressed as a percentage, with the total weight for all of the goals totaling 100 percent.

Within each goal category, a series of specific criteria were established. As with the overarching goals, the TAC representatives were tasked with providing recommendations with respect to the relative importance, or weight, to be assigned to each criterion within a goal category. The weights were expressed as a percentage, with the total weight for all of the criteria within each defined goal category totaling 100 percent.

Multiplying the goal category weight by the individual criteria weight yields an applied weight factor for that criterion. This scoring methodology measures the performance of each alternative based on the relative importance of each goal, with the score for each goal established by the sum of its component evaluation criteria. For example, as part of the evaluation of through truck diversion alternatives, a goal category of Regional Traffic Flow was identified. The average weight of 24.8 percent was identified by the recommendations provided by the TAC representatives. Under this goal category, six (6) specific criteria were defined. Regional Heavy Truck (Tractor Trailer) VMT Change, one of the six (6) criteria was assigned a weight of 17.5 percent.

Multiplying these factors - goal category weight of 24.8 percent by an individual criterion weight of 17.5 percent - yields an applied weight of 4.34 percent. The total possible score that can be achieved by any alternative was set to 1,000. Multiplying the 4.34 percent weight for the example criteria by 1,000 yields the maximum possible score that may be assigned to that criterion, or a maximum score of 43.4. The 43.4 is combined with scores for other criteria in the goal category to determine the goal score. The goal scores are then summed to determine a total score

Each alternative was evaluated under each criteria following one of two procedures. For some of the criteria, the roadway network assignment model was applied to calculate a change in a definable performance measure. For example, for the criterion Regional Heavy Truck (Tractor Trailer) VMT Change, the roadway network model was utilized to quantify the total change in heavy truck vehicle miles of travel (VMT) for AM and PM peak hour in year 2050. Assuming that all of the alternatives evaluated would result in a reduction in heavy truck VMT, the alternative that would result in the greatest reduction relative to the others would receive the maximum possible score of 43.4. The alternative that would result in the smallest reduction in heavy truck VMT would receive a score of “zero”. In this case, a score of “zero” does not imply



that the alternative has no benefit. It indicates that the alternative has the least level of benefit among the alternatives being considered. The other alternatives receive a score proportionate to the level of benefit in comparison with the best alternative.

In the hypothetical example below (Table 7.1), the maximum possible weighted score is 200, the maximum decrease in VMT achieved by any single alternative is Alternative A, which received the maximum possible weighted score, and the minimum decrease in VMT is Alternative D, which receives the minimum score of zero. Alternatives B and C are scored in proportion to the range of values for decrease in VMT.

**Table 7.1: Example of Relative Scoring of Evaluation Criterion**

<b>Alternative</b>	<b>Decrease in VMT</b>	<b>Maximum Possible Weighted Score</b>	<b>Weighted Score</b>
<b>A</b>	<b>200</b>	<b>200</b>	<b>200</b>
<b>B</b>	<b>140</b>	<b>200</b>	<b>120</b>
<b>C</b>	<b>110</b>	<b>200</b>	<b>80</b>
<b>D</b>	<b>50</b>	<b>200</b>	<b>0</b>

In some cases, an alternative was found to result in a negative impact with respect to specific criteria. A negative benefit is a consequence of an alternative that is contrary to the desired effect. For example, an increase in heavy truck traffic on local roadways would be considered a negative benefit associated with a particular alternative. In these cases, to accurately reflect the negative implications of an alternative the maximum possible weighted score was applied as the range of scores separating the most beneficial alternative from the least beneficial alternative. In the hypothetical example below (Table 7.2), the maximum possible weighted score is 200. The maximum decrease in VMT is achieved by Alternative A, while Alternative D was found to result in an increase in VMT. The maximum possible weighted score of 200 is applied as the absolute value of the difference in scores to be assigned between the most beneficial and the least beneficial alternative. Alternative A receives a score of 120, while Alternative D receives a score of -80. Alternatives B and C are scored in proportion to the range of values for decrease in VMT.



Table 7.2: Example of Relative Scoring of Evaluation Criterion

Alternative	Decrease in VMT	Maximum Possible Weighted Score	Weighted Score
A	200	200	120
B	140	200	72
C	0	200	-40
D	-50	200	-80

Other criteria are applied in an “all-or-nothing” process. Alternatives that satisfy the criteria receive 100 percent of the possible maximum score defined for this criterion. Alternatives that do not satisfy the criteria receive a score of zero. Some of these “all-or-nothing” criteria were scored through application of the network or microsimulation models developed for this study, while the scoring of other criteria was based upon a qualitative review of the concept plans. As an example, the roadway network model was applied to the criterion Potential for Air Quality Impacts in Environmental Justice Communities. If the alternative was found to increase vehicle miles of travel on roadways in Environmental Justice communities, the alternative received a score of zero under this criteria. If the alternative was found to decrease vehicle miles of travel on roadways in Environmental Justice communities, the alternative received the maximum possible score. In cases where the alternative was found to have a deminimus increase vehicle miles of travel on roadways in Environmental Justice communities, the assessment was determined to be inconclusive, with the alternative receiving a score of one-half of the maximum possible score. The criteria defining whether or not BRT lanes are provided in the alternative was applied through a qualitative review of the alternative plan, with the alternative receiving the maximum score under this criterion if BRT accommodations are included in the alternative. The cumulative score for each alternative based upon all of the defined criteria was utilized to identify the preferred alternative for advancement into the preliminary design phase of the project.



## 7.2 Through Truck Diversion Concept Alternatives

### 7.2.1 Tier I - Supportive and Not Detrimental Outcome Screening

A number of roadway and bridge alternative concepts were identified that could potentially provide a more attractive travel path for heavy trucks, thereby attracting these trips away from the study corridor. Additional alternative concepts were identified that would utilize rail and barge infrastructure to provide an alternative mode for transporting freight, removing some truck trips from the roadway network altogether. While redistribution of truck activity away from the corridor may produce significant local benefits within the Western Waterfront, creation of detrimental outcomes along the roadways and within the existing neighborhoods through which these trucks would choose to travel would be the relocation of an issue as opposed to a solution to an issue. A series of screening assessments was developed and applied to the through truck diversion alternatives to ensure that locally preferred alternatives were supportive of the purpose and need, goals and objectives, and that no adverse impacts would be created in other locations within Jersey City or the region.

Twenty-four through truck diversion concept alternatives, including no-build, were evaluated using the Tier I screen. Sixteen were screened out based on non-supportive or detrimental impact under two or more criteria. Three alternatives were screened out solely based on the single criterion of lack of removal of a significant volume of through trucks from the corridor. Four alternatives passed through the Tier I screen and were advanced to Tier II (Table 7.3). Following is a description of the Tier I criteria for through truck diversion concept alternatives and their application.

#### 7.2.1.1 Tier I Goal Category 1: Vehicular Mobility

Goal Category 1 addressed issues related to truck mobility, trip costs and the reduction in heavy trucks utilizing the corridor. Three criteria comprised the category as follows:

##### **Criterion 1 - Does Not Improve Regional Truck Mobility**

This criterion screens out alternatives that do not improve regional truck mobility. Improvement to an existing travel path, or creation of a new travel path, can result in improvement to regional truck mobility provided that truck drivers may elect to utilize the new or improved routes in significant numbers. Improvements to regional truck mobility may also



## **Route 440/Routes 1&9T Multi-Use Urban Boulevard and Through Truck Diversion Concept Development Study**

---

be achieved by the diversion of freight movements to non-truck modes of transport such as rail or barge systems, thereby reducing congestion and improving mobility for trucks that remain on the regional roadways.



Table 7.3: Through Truck Diversion Alternative Evaluation  
Tier I – Supportive and Not Detrimental Outcome Screening

No.	Screening Criteria	Description	Considerations for Rating	SCORES FOR ALTERNATIVES																									
				No-Build	Alt R-1	Alt R-2	Alt F-1	Alt F-2	Alt F-3	Alt F-4	Alt E-1	Alt E-2	Alt E-3	Alt W-1	Alt W-2	Alt W-3	Alt W-4	Alt W-5	Alt S-1	Alt S-2	Alt S-3	Alt S-4	Alt S-5	Alt S-6	Alt D-1	Alt D-2	Alt D-3		
<b>Vehicular Mobility</b>																													
1	Does Not Improve Regional Truck Mobility	No significant reduction in heavy truck travel distance / time between origin/destination points	Origin/Destination Points defined as the three points representing the cordon line that trucks traveling on the study corridor must cross: NJTPK Interchange 14-A; Interchange of I-78 with Route 1; Tonnele Circle.	Fail	Pass	Pass	Pass	Pass	Pass	Pass	I	Fail	I	Pass	Pass	Pass	Pass	I	Pass	Pass	Pass	I	Pass	Pass	Fail	Fail	Fail		
2	Increases Trip Costs (considered in the evaluation but not deemed to be a fatal flaw)	Increases the trip cost for heavy trucks - additional tolls, requirement to use multiple modes (truck to rail) etc.	If use of the alternative route would cost more than use of the study corridor, it cannot be consider an equivalent alternative in support of prohibiting/diverting through trucks from the corridor. Without heavy truck prohibitions on the corridor, the new route would not have a meaningful market demand.	Pass	Pass	Pass	Fail	Pass	Pass	Pass	Pass	Pass	Fail	Fail	Fail	Fail	Pass	Pass	Fail	Pass	Pass								
3	Does Not Remove Significant Volume of Through Trucks from the Corridor	Enhances creation of Livable Communities by reducing heavy through truck traffic proximate to existing and new neighborhoods in the Western Waterfront area of Jersey City	If the alternative does not result in a significant reduction in heavy through trucks on the corridor, then it does not support livability	Fail	Fail	Fail	Fail	Fail	Fail	Fail	Fail	Pass	Fail	Fail	Pass	Fail	Pass												
<b>Environmental Impacts</b>																													
4	Vehicular Roadway Encroaches Upon Lincoln Park Property	Requires construction of motorized vehicle travelways within Lincoln Park	yes / no	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Fail	Pass														
5	Precludes Waterfront Access - (Riparian Access)	Precludes public access to waterfront	Applies primarily to concepts that envision new waterfront roadway or water crossing by bridge or barge. Focus on landing point of the infrastructure.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Fail	Pass														
6	Adversly Impacts Air Quality	Likelihood to result in increased vehicle emissions due to increases in regional VMT and VHT	Increases in both heavy truck VMT and VHT = fail, Decrease in both = Pass, Increase in VMT but decrease in VHT = inconclusive.	Pass	Pass	Pass	Pass	Pass	Pass	Pass	I	Fail	Fail	Pass	Pass	I	Pass	I	Pass	Pass	Pass	I	Pass	Pass	Fail	Fail	Fail		
7	Increases Heavy Truck Traffic on Local Jersey City Streets	Requires / encourages heavy trucks to utilize local neighborhood streets to access alternative route	yes / no	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Fail	Fail	Fail		
8	Creates / Increases Congested Traffic Conditions	Results in, or increases congestion and failed traffic operations on portion(s) of the roadway infrastructure.	Creates volume-to-capacity (v/c) ratios in excess of 1.0, or exacerbates conditions where v/c ratios exceed 1.0 under future No-Build conditions	Fail	Pass	Fail	Fail	Fail	Fail	Pass	Pass	Fail	Fail	Fail															
9	Adversely Effects Significant Historic Resources	Construction of the alternative would require demolition or unacceptable modification of a significant historic resource	yes / no	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Fail	Fail	I	Pass												
Advance to Tier II ?				NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO	NO	NO	NO	YES	YES	NO	NO	NO



The method of evaluation to determine if an alternative improves regional truck mobility was application of the regional roadway network model that was developed for this study. The new or improved route for each of the through truck diversion alternative was integrated into the future roadway network model. Heavy truck origin/destination points (Figure 7.1) were defined as the three points representing the cordon lines that through trucks traveling on the study corridor must cross: NJTPK Interchange 14-A; Interchange of I-78 with Route 1/9; and the intersection of Routes 1&9T with Route 7. The majority of the heavy through trucks traveling along the corridor pass through two of these points, one upon entering the study area and the second upon exiting. The remainder of the truck trip outside of these three points is not anticipated to be affected by the use of an alternative travel path developed to connect these three points. Therefore, evaluation of the travel times and distances between the three points accounts for the total change in travel time and distance that would occur within the entire region.

**Figure 7.1: Heavy Through Truck Diversion Categories**



Trip tables for the year 2050 were loaded into the regional roadway network models for the future No-Build condition, and for each of the through truck diversion alternatives individually. The travel distance and total route travel time based upon prevailing travel speeds was calculated between the three through truck origin/destination points, with the values



compared to the travel distance and travel times under the no-build condition. If the alternative travel path created by the concept alternative resulted in longer travel distance and travel time, the concept was considered as not meeting the objective of improvement to regional truck mobility. If the alternative resulted in shorter travel distance and travel time, the concept was determined to meet the objective of improving regional truck mobility. If the concept was found to result in a shorter travel distance but a longer travel time (or a longer travel distance but a shorter travel time), no fixed conclusion could be reached for this criteria. Therefore, the alternative was not deemed to result in a supportive outcome, and was eliminated by this criterion.

Virtually all of the through truck diversion concept alternatives enhance regional truck mobility to some extent. The exceptions that would not improve regional truck mobility are alternative E-2, which restricts heavy trucks to the lower level of Route 139, and alternatives D-1, D-2 and D-3, which are regulatory and policy measures to preclude or deter heavy trucks from utilizing the Route 440/Routes 1&9T corridor without providing a new or improved alternative route for use of the diverted trucks.

### **Criterion 2 - Increases the Cost of Through Truck Trips**

This criterion assesses the potential for an increase in costs for a truck to travel between the three through truck origin-destination points (Figure 7.1). The selection of the most appropriate travel path by a through truck is in large measure based upon the overall cost and perceived efficiency of the route. Truck drivers typically seek the most efficient route for travel from an origin to a destination in terms of minimum travel time, minimum travel distance and avoidance of tolls.

Cost considerations for truck trips related to longer travel time or distance are addressed by implication under criterion 1 in the assessment of truck mobility improvements. For alternatives that improve existing or create new roadway routes for through trucks, this criterion was applied as a “yes or no” assessment based upon whether or not use of the alternative route would require payment of a toll. However, the potential exists for a route to require payment of a toll but significantly reduce travel time or distance, thereby reducing the overall cost of the truck trip. Even though use of an alternative route increases toll costs, a driver may still elect to utilize the alternative and bear the additional cost in exchange for a benefit such as reduced travel time. This criterion identifies alternatives that increase the cost of moving a load or a container of freight, but is inconclusive without further analysis with



respect to the effect of the cost on travel path decisions. Therefore, this criterion does not by itself screen out any alternatives.

Using multiple travel modes (truck-barge, truck-rail, etc) can significantly increase the cost of transporting a load of goods, particularly for shorter distance trips. While the non-truck alternatives may represent a benefit in terms of increased mobility (criterion 1) the increased costs will likely deter shippers from shifting from truck transport to rail or barge transport.

A number of the alternatives would reduce the travel distance or time of travel, but would require the trucks to utilize a toll road, thereby increasing the cost of the trip (Alternatives E-1, S-1, S-2, S-3 and S-4). Further, alternatives that would require the transfer of the goods from truck to barge and back to truck were considered to add significantly to the cost of the trip.

### **Criterion 3 - Does Not Remove Significant Volume of Through Trucks from the Corridor**

One of the primary objectives of the concept development study was to support the creation of livable communities by reducing heavy through truck traffic proximate to existing and new neighborhoods in the Western Waterfront area of Jersey City. Alternatives that were not found to significantly reduce the volume of heavy trucks along the study corridor as a whole or along the central section were removed from further consideration. A significant volume was defined as a reduction in the volume of heavy trucks traveling along the corridor of at least ten percent.

The roadway network model was applied in the determination of the volume of heavy truck traffic that would be diverted from the study corridor for each through truck diversion alternative. Thirteen alternatives were found to remove a significant volume of heavy truck traffic from the corridor. Eleven alternatives failed to remove a significant volume of through trucks from the corridor and were screened out from further consideration.

#### **7.2.1.2 Tier I Goal Category 2: Environmental Impacts**

Criteria Category 1 addressed environmental issues related to air quality, impacts to Lincoln Park, cultural and historic resources, access to the waterfront, and traffic congestion. Six criteria comprised the category as follows:

### **Criterion 4 - Vehicular Roadway Encroaches Upon Lincoln Park Property**



This criterion screens out alternatives that require any new roadway construction within any portion of Lincoln Park in Jersey City. Lincoln Park is part of the Hudson County park system. There appears to be case law that says that county parks commission lands may not be conveyed for non-recreational uses. Sidewalks, bike paths and landscaping are deemed to be supportive of and consistent with recreational uses within Lincoln Park. Accordingly, alternatives that avoid roadway encroachment upon Lincoln Park property and provide new bicycle or pedestrian accommodations within Lincoln Park as part of the park's recreational facilities were not screened out.

Additionally, this criterion also screens out alternatives that encroach upon Green Acres lands. Green Acres regulations do not permit diversion of Green Acres lands for roadway purposes when other alternatives that do not require diversion of green acres lands exist.

One alternative, E-3, which encroaches upon Lincoln Park property and Green Acres lands, was screened out by this criterion.

#### **Criterion 5 - Precludes Waterfront Access**

This criterion screens out alternatives that preclude or significantly impair the ability of the public to access the Hackensack River waterfront. Since the through truck diversion alternatives were developed at a conceptual level, it was anticipated that design features could be incorporated into virtually all of the alternatives to facilitate public access to the waterfront, with one exception. Alternative E-3 constructs a new truck diversion roadway along the Hackensack River edge from Route 7 to Danforth Avenue. E-3 creates a significant impediment to waterfront access along virtually the entire length of the study area, and was screened out.

#### **Criterion 6 - Adversely Impacts Air Quality**

While not putting forth specific thresholds or criteria, the National Environmental Policy Act (NEPA) requires consideration of air quality impacts in the assessment of alternatives. Alternatives that adversely impact air quality are eliminated from consideration if other alternatives exist that would not result in an adverse impact. This criterion screens out alternatives that adversely impact regional air quality.

Beyond the requirements of NEPA, one of the goals of this study was support for the creation of livable communities in the Western Waterfront of Jersey City. Any action that would



potentially increase vehicles emissions, and thereby reduce air quality in the area, would not be supportive of livability or be environmentally sustainable.

Each through truck diversion alternative was assessed through application of the regional roadway network assignment model that was developed for this study. The year 2050 trip tables (Chapter 5) were loaded into the regional roadway network models for the future No-Build condition (Chapter 5), and for each of the through truck diversion alternatives individually. The total truck vehicle miles of travel (VMT) and truck vehicle hours of travel (VHT) were extracted for each alternative and compared to the regional truck VMT and truck VHT under the no-build condition. Alternatives found to result in an increase in both VMT and VHT were removed from further consideration. Alternatives that were found to result in a reduction in both VMT and VHT were considered to have a positive effect on vehicle emissions and air quality, and were advanced for further analysis. If an alternative was found to increase VMT but reduce VHT, or decrease VMT but increase VHT, no final determination could be made with respect to the potential effect on air quality, and the determination was noted in Table 7.3 as inconclusive (“I”). Five alternatives were found to have a negative effect and were screened out.

#### **Criterion 7 - Increases Heavy Truck Traffic on Local Jersey City Streets**

This criterion screens out alternatives that increase heavy truck traffic on local Jersey City streets. One of the primary goals and objectives of this study was the identification of a corridor improvement that would support the creation of livable communities in the Western Waterfront of Jersey City. This goal is not to be achieved at the expense of quality of life, livability and air quality in other sections of Jersey City.

This criterion was quantified through application of the roadway network assignment model that was developed for this study. The regional roadway network model is relatively coarse in nature, and does not include all local streets within Jersey City. For the purpose of this analysis, a representative sample of local roadways incorporated into the model was selected for analysis. These roadways included:

- John F. Kennedy Boulevard – Route 440 to Tonnelle Avenue
- West Side Avenue – Danforth Avenue to Broadway
- Communipaw Avenue – Route 440 to Bergen Avenue
- Duncan Avenue – Routes 1&9T to John F. Kennedy Boulevard
- Danforth Avenue – Route 440 to John F. Kennedy Boulevard



The total aggregate heavy truck vehicle miles of travel (VMT) on these roadways was extracted from the model for each alternative and compared to the future No-Build condition. Three alternatives result in an increase in the heavy truck VMT traffic on local Jersey City roadways and were removed from further consideration.

### **Criterion 8 - Creates / Increases Congested Traffic Conditions**

This criterion screens out alternatives that cause traffic congestion elsewhere in Jersey City or the region. Roadway improvements that attract traffic to different travel paths than those currently being utilized can create or exacerbate congested conditions elsewhere. While reduction in traffic volumes and the calming of traffic flows along the corridor support the goals and objectives of this study, creation of congested conditions elsewhere in Jersey City or the region is a detrimental outcome. Each through truck diversion concept was integrated into the future roadway network model. The year 2050 trip tables were loaded into the regional roadway network models for the future No-Build condition, and for each of the through truck diversion alternatives individually. Volume-to-capacity (v/c) ratios were extracted from the model for each roadway segment for each through truck diversion alternative. These values were compared to the same performance measures extracted from the No-Build condition model. Seven alternatives were found to create volume-to-capacity ratios in excess of 1.0, or to create an increase in v/c ratios that were previously greater than 1.0, and were removed from further consideration.

### **Criterion 9 - Adversely Effects Significant Historic Resources**

This criterion screens out alternatives that adversely affect significant historic resources and for which suitable measures to adequately mitigate adverse impact were likely not available. Two alternatives were screened out by this criterion, both of which entailed major modifications to the historic Pulaski Skyway to facilitate truck accommodation.

As discussed in Chapter 6, the development of through truck diversion alternatives was prepared at a coarse conceptual level only. Locations that are distant from the primary roadway study area were not inventoried for the existence of significant historic or cultural resources. It is recognized that alternatives that are advanced for further consideration will require additional investigation with respect to the potential for impacts to historic and cultural resources along their alignments.



## 7.2.2 Tier II Detailed Evaluation

A total of four (4) through truck diversion concept alternatives passed the Tier I screening process. These alternatives were advanced for a more detailed analysis under the Tier II screening process in order to determine the comparative utility of the remaining alternatives. A total of nineteen (19) individual criteria were established within six (6) overarching goal categories. The relative importance of the goals was quantified by weighting factors that were established by the TAC. The TAC also established weights for the criteria within each goal set (Table 7.4).

Using output from the roadway network and Paramics microsimulation models, as well as qualitative evaluation of specific criteria, a detailed evaluation and ranking of the through truck diversion alternatives was conducted (Table 7.5). For purposes of this evaluation, the region is defined as the area bounded by the Hudson River, NJ Route 3/I-495 corridor, the Garden State Parkway and I-278. Following is a description of the Tier II goals and criteria for through truck diversion concept alternatives and their application.



**Table 7.4: Through Truck Diversion Alternative Evaluation - Tier II Goal and Criterion Weights**

Goal	Criterion	Goal Weight	Criterion Weight	Applied Weight <sup>4</sup>
<b>Goal 1: Regional Traffic Flow</b>		<b>24.8%</b>		
1	Regional Heavy Truck (Tractor Trailer) VMT Change		17.5%	4.3%
2	Regional Heavy Truck (Tractor Trailer) VHT Change		16.3%	4.1%
3	Regional General Traffic VMT Change		11.9%	3.0%
4	Regional General Traffic VHT Change		11.9%	3.0%
5	Support Modal Shift in Freight Movements		24.7%	6.1%
6	Creates/Enhances Route Redundancy for Trucks and General Traffic		17.7%	4.4%
<b>Goal 2: Through Truck Diversion</b>		<b>20.0%</b>		
7	Central Section Heavy Through Truck (Tractor Trailer) VMT Change		46.0%	9.2%
8	Western Waterfront Heavy Through Truck (Tractor Trailer) VMT Change		54.0%	10.8%
<b>Goal 3: Complete Streets</b>		<b>12.7%</b>		
9	Bicycle lanes		40.2%	5.1%
10	Sidewalks		59.8%	7.6%
<b>Goal 4: Environmental Justice</b>		<b>15.7%</b>		
11	Relative Change (Increase or Decrease) in heavy Truck Traffic on local surface roads in EJ Communities		25.0%	3.9%
12	Relative Change (Increase or Decrease) in General Traffic on local surface roads in EJ Communities		16.5%	2.6%
13	Potential for Air Quality Impacts in EJ Communities		22.3%	3.5%
14	Supports Creation of Economic Opportunity		36.2%	5.7%
<b>Goal 5: Mass Transit System</b>		<b>15.1%</b>		
15	Light Rail Transit Expansion		36.2%	5.5%
16	BRT Service Expansion		31.5%	4.8%
17	Local or Regional Bus Service Expansion		32.3%	4.9%
<b>Goal 6: Access and Leveraging</b>		<b>11.7%</b>		
18	Potential Port Access Enhancement		45.4%	5.3%
19	Leverage Other Regional Freight Mobility Improvement Plans		54.6%	6.4%

<sup>4</sup> (Goal Weight) x (Criterion Weight) = (Applied Weight)



Table 7.5: Through Truck Diversion Alternative Evaluation - Tier II Detailed Assessment Scores

No.	Criterion	Description	INPUT SCORES				Maximum Possible Score	FINAL SCORES			
			Alt W-4	Alt W-5	Alt S-5	Alt S-6		Alt W-4	Alt W-5	Alt S-5	Alt S-6
<b>Goal 1: Regional Traffic Flow</b>							<b>248</b>	<b>-19</b>	<b>-4</b>	<b>34</b>	<b>34</b>
1	Regional Heavy Truck (Tractor Trailer) VMT Change	Heavy Truck VMT Reduction (modal shifting and route diversions)	-152	114	86	86	43	25	-19	-14	-14
2	Regional Heavy Truck (Tractor Trailer) VHT Change	Heavy Truck VHT Reduction (modal shifting and route diversions)	15	0	-1	-1	41	-37	1	3	3
3	Regional General Traffic VMT Change	Passenger Vehicle Route Diversions - Secondary Benefit	228	301	28	28	30	-22	-30	0	0
4	Regional General Traffic VHT Change	Passenger Vehicle Route Diversions - Secondary Benefit	677	24	-8	-8	30	-29	-1	0	0
5	Support Modal Shift in Freight Movements	Supports environmental sustainability through encouragement of non-truck freight movement (i.g.: rail, barge, ferry)	No	No	No	No	61	0	0	0	0
6	Creates/Enhances Route Redundancy for Trucks and General Traffic	Provide new alternative travel path for trucks and general traffic when existing route is constrained (e.g.: construction, incident, excessive traffic, etc)	Yes	Yes	Yes	Yes	44	44	44	44	44
<b>Goal 2: Through Truck Diversion</b>							<b>200</b>	<b>153</b>	<b>123</b>	<b>0</b>	<b>0</b>
7	Central Section Heavy Through Truck (Tractor Trailer) VMT Change	Reduction in heavy truck VMT along the Central Section of Rt 440 / Rts 1&9T corridor	-65	-15	-5	-5	92	92	15	0	0
8	Western Waterfront Heavy Through Truck (Tractor Trailer) VMT Change	Reduction in heavy truck VMT along the Rt 440/Rts 1&9T corridor	-159	-277	-5	-5	108	61	108	0	0
<b>Goal 3: Complete Streets</b>							<b>127</b>	<b>127</b>	<b>127</b>	<b>127</b>	<b>0</b>
9	Bicycle lanes	Affords opportunity to include new bicycle lanes to enhance regional connectivity	Yes	Yes	Yes	No	51	51	51	51	0
10	Sidewalks	Affords opportunity to include pedestrian lanes to enhance regional connectivity	Yes	Yes	Yes	No	76	76	76	76	0
<b>Goal 4: Environmental Justice</b>							<b>157</b>	<b>-44</b>	<b>-38</b>	<b>74</b>	<b>74</b>
11	Relative Change (Increase or Decrease) in heavy Truck Traffic on local surface streets in EJ Communities	Relative increase or decrease in Truck VMT in EJ Communities	40	12	0	0	39	-39	-12	0	0
12	Relative Change (Increase or Decrease) in General Traffic on local surface streets in EJ Communities	Relative increase or decrease in General Traffic VMT in EJ Communities	79	456	0	0	26	-4	-26	0	0
13	Potential for negative Air Quality Impacts in EJ Communities	Has the potential for creating significant negative air quality impacts in EJ Communities that would result from increased volumes and congestion.	Yes	Yes	I	I	35	0	0	18	18
14	Supports Creation of Economic Opportunity	Potential to support creation of economic opportunity in an EJ community through creation or enhancement of connections between EJ communities and external employment centers	No	No	Yes	Yes	57	0	0	57	57
<b>Goal 5: Mass Transit System</b>							<b>151</b>	<b>49</b>	<b>49</b>	<b>96</b>	<b>49</b>
15	Light Rail Transit Expansion	Afford opportunity to expand or integrate extension of light rail transit system	No	No	No	No	55	0	0	0	0
16	BRT Service Expansion	Affords opportunity to expand or integrate BRT service on dedicated lanes	No	No	Yes	No	48	0	0	48	0
17	Local or Regional Bus Service Expansion	Affords opportunity to expand or integrate local or regional bus service	Yes	Yes	Yes	Yes	49	49	49	49	49
<b>Goal 6: Access and Leveraging</b>							<b>117</b>	<b>117</b>	<b>117</b>	<b>117</b>	<b>117</b>
18	Potential Port Access Enhancement	Improves access to the ports and between the ports and existing and planned port support industry zones	Yes	Yes	Yes	Yes	53	53	53	53	53
19	Leverage Other Regional Freight Mobility Improvement Plans	Utilizes currently planned or ongoing infrastructure improvement project(s) as key component of the alternative route. Increases the value and utility of the currently planned improvement.	Yes	Yes	Yes	Yes	64	64	64	64	64
							<b>1,000</b>	<b>383</b>	<b>373</b>	<b>448</b>	<b>273</b>



### 7.2.2.1 Tier II Goal Category 1: Regional Traffic Flow

Goal category one addressed impact to regional traffic flow, and was weighted at 24.8%. For application of Goal Category 1, the region is defined as the area bounded by the Hudson River, the Garden State Parkway, NJ Route 3/I-495 corridor and the Goethalls Bridge/I-278 corridor. Six criteria comprised the category, as follows:

#### **Criterion 1 - Regional Heavy Truck (Tractor Trailer) VMT Change**

This criterion compares the alternatives based upon relative impact to total regional heavy truck Vehicle Miles of Travel (VMT). VMT is a key descriptor used for quantifying the amount of activity on a roadway network. It is particularly useful for comparing the relative effectiveness of alternative roadway configurations. Alternatives that reduce VMT are viewed positively, since a reduced VMT typically equates to reductions in lifecycle roadway maintenance needs, congestion, vehicle emissions, and improvement to air quality. The regional network model was applied to determine the change in regional VMT for each alternative. Total heavy truck VMT during the AM and PM peak hours was extracted from the models of the future 2050 No-Build conditions and each Tier II through truck diversion alternative.

Alternatives W-5, S-5 and S-6 result in increases in regional truck VMT, while Alternative W-4 results in a reduction in regional truck VMT. Alternative W-4 provides the greatest reduction in regional truck VMT and receives the highest score. Alternatives W-5 results in the greatest increase in regional truck VMT and receives the lowest negative score (Table 7.5).

#### **Criterion 2 - Regional Heavy Truck (Tractor Trailer) VHT Change**

This criterion compares the alternatives based upon relative impact to total regional heavy truck Vehicle Hours of Travel (VHT). As with VMT, VHT is a key descriptor for quantification of the amount of activity on a roadway network. Reduction in VHT on a roadway network typically equates to reductions in lifecycle roadway maintenance needs, congestion, vehicle emissions, and improvements to air quality. The regional network model was applied to determine the change in regional VHT for each alternative. Total heavy truck VHT during the AM and PM peak hours was extracted from the models of the future 2050 No-Build conditions and each Tier II through truck diversion alternative.



With the exception of Alternatives W-4, all of the alternatives result in a decrease in regional truck VHT. Alternatives S-5 and S-6 result in the greatest decrease in VHT. W-4 receives the lowest score under this criterion. It should be noted that although W-4 results in an increase in VHT, W-4 results in a decrease in VMT under the first criterion above.

### **Criterion 3 - Regional General Traffic VMT Change**

This criterion compares the alternatives based upon relative impact to total regional general traffic Vehicle Miles of Travel (VMT). Similar to the assessment of regional heavy truck VMT, the regional network model was applied in the evaluation of changes in general traffic VMT for each alternative. Total non-truck VMT during the AM and PM peak hours was extracted from the models of the future 2050 No-Build conditions and each Tier II through truck diversion alternative.

Total non-truck vehicle miles of travel (VMT) during the AM and PM peak hours was extracted from the models of the future No-Build conditions and each of the alternatives that passed through the Tier I screening. All of the alternatives result in modest increases in regional general traffic VMT. Alternatives S-5 and S-6 result in the least increase in general traffic VMT and receive the highest score. Alternative W-5 results in the greatest increase and receives the lowest score.

All of the alternatives create an increase in regional general traffic VMT. Since all of the alternatives create a negative impact under this criterion, all of the scores are equal to or less than zero. Alternative W-5 creates the greatest increase in regional general traffic VMT and receives the lowest score. Alternatives S-5 and S-6 create de minimis increases in general traffic VMT and receive the highest score of zero.

### **Criterion 4 - Regional General Traffic VHT Change**

This criterion compares the alternatives based on relative impact to total general traffic Vehicle Hours of Travel (VHT). Similar to the assessment of regional heavy truck VHT, the regional network model was applied to determine the change in regional VHT for each alternative. Total non-truck VHT during the AM and PM peak hours was extracted from the models of the future 2050 No-Build conditions and each Tier II through truck diversion alternative.



Alternatives S-5 and S-6 result in a decrease in regional general traffic VHT and receive the highest score. Alternatives W-4 and W-5 result in increases in regional general traffic VHT. Alternative W-4 provides the greatest increase in regional general traffic VHT and receives the lowest score.

#### **Criterion 5 - Support Modal Shift in Freight Movements**

This criterion qualitatively determines whether or not the alternatives result in reduction in total truck movements in the region by encouraging greater use of rail and barge/freight ferry. All of the Tier II alternatives create new or expand existing roadway and bridge infrastructure and do not encourage increased utilization of non-truck modes of to move goods to, from or through the region. All of the Tier II alternatives receive a score of zero.

#### **Criterion 6 - Creates/Enhances Route Redundancy for Trucks and General Traffic**

This criterion qualitatively determines whether or not the alternatives create or enhance the availability of multiple or redundant travel routes for the movement of trucks through the region. All of the Tier II alternatives create new or expand existing roadway and bridge infrastructure that enhances route redundancy for heavy truck travel to, from and through the region. All alternatives received the maximum possible score.

#### **7.2.2.2 Tier II Goal Category 2: Through Truck Diversion**

Goal category two addressed effectiveness in diverting through trucks, and was weighted at 20%. Two criteria comprised the category as follows:

#### **Criterion 7 - Central Section Heavy Through Truck (Tractor Trailer) VMT Change**

This criterion compares the relative impact of the alternatives to total heavy truck VMT along Route 440 between Danforth Avenue and Communipaw Avenue (the Central Section of the corridor). This section of the corridor runs through the portion of the Western Waterfront where most new residential, retail and commercial development will occur. Reduction of heavy truck traffic in the Central Section supports livability and quality of life.



The regional network model was applied to determine the change in VMT along the central section for each alternative. Total heavy truck VMT during the AM and PM peak hours was extracted from the models of the future 2050 No-Build conditions and each Tier II through truck diversion alternative.

All of the alternatives provide a reduction in heavy trucks along the central section of the corridor. Alternative W-4 provides the greatest reduction and receives the highest score.

### **Criterion 8 - Western Waterfront Heavy Through Truck (Tractor Trailer) VMT Change**

This criterion compares the relative effectiveness of each alternative in removing heavy through truck traffic from the Route 440/Routes 1&9T study corridor as a whole. The regional network model was applied to determine the change in VMT along the length of the corridor from NJ Route 7 to Bayonne for each alternative. Total heavy truck VMT during the AM and PM peak hours was extracted from the models of the future 2050 No-Build conditions and each Tier II through truck diversion alternative.

All of the alternatives provide a reduction in heavy trucks along the Route 440/Routes 1&9T corridor. Alternative W-5 provides the greatest reduction and receives the highest score.

### **7.2.2.3 Tier II Goal Category 3: Complete Streets**

In furtherance of the New Jersey Department of Transportation's Complete Streets policy as well as the purpose and need statement and associated goals and objectives, goal category three addressed supportability of complete streets principles, and was weighted at 12.7%. Two criteria comprised the category, as follows:

### **Criterion 9 - Bicycle lanes**

This criterion identifies the feasibility of incorporating bicycle lanes or paths into each alternative. With the exception of Alternative S-6, all of the alternatives could potentially incorporate bicycle lanes or paths. Alternative S-6 creates a tunnel beneath Newark Bay connecting Route 440 to Doremus Avenue in Newark. Inclusion of bike lanes within the tunnel would require a significantly wider tunnel, adding to the cost and making this alternative



economically infeasible. Alternative S-6 receives a score of zero. Alternatives W-4, W-5 and S-5 each receive the maximum score.

### **Criterion 10 - Sidewalks**

This criterion identifies the feasibility of incorporating sidewalks into each alternative. With the exception of Alternative S-6, all of the alternatives could potentially incorporate sidewalks. Alternative S-6 creates a tunnel beneath Newark Bay connecting Route 440 to Doremus Avenue in Newark. Inclusion of sidewalks wider than the sidewalks typically provided within a tunnel for use by maintenance personnel would require a significantly wider tunnel, adding to the cost and making this alternative economically infeasible. Alternative S-6 receives a score of zero. Alternatives W-4, W-5 and S-5 each receive the maximum score.

#### **7.2.2.4 Tier II Goal Category 4: Environmental Justice**

Goal category four addressed impact from an environmental justice perspective, and was weighted at 15.7%. Four criteria comprised the category, as follows:

### **Criterion 11 - Relative Change (Increase or Decrease) In Heavy Truck Traffic On Local Surface Streets In Environmental Justice (EJ) Communities**

This criterion compares the alternatives based upon the relative impact of heavy truck VMT on local surface streets in environmental justice communities. While supportive of the creation of livable communities, diversion of through trucks away from the study corridor such that they would negatively impact existing environmental justice communities<sup>5</sup> represents a detrimental outcome. Conversely, the diversion of through trucks such that there is a reduction in impact to other existing environmental justice communities represents a positive outcome.

The regional network model was applied to determine the change in heavy truck VMT in existing environmental justice communities for each alternative. Total heavy truck VMT on local surface streets within or adjacent to environmental justice communities during the AM and PM peak hours was extracted from the models of the future 2050 No-Build conditions and

---

<sup>5</sup> Environmental Justice Communities are defined in Chapter 2



each Tier II through truck diversion alternative. Local surface streets not only carry traffic through EJ Communities, but typically include residential and commercial development along the roadways. Elevated roadways such as the NJ Turnpike Hudson County Extension within or adjacent to EJ Communities were excluded from this consideration.

Alternatives W-4 and W-5 provide increases in heavy truck VMT in the EJ community that abuts the eastern side of the Route 1&9T corridor between Sip Avenue and Newark Avenue. The other alternatives would provide reductions in heavy truck traffic on local streets within or adjacent to existing EJ communities. Alternatives S-5 and S-6 provide a modest reduction and receive the highest score.

**Criterion 12 - Relative change (Increase or Decrease) in general traffic on local surface roads in EJ Communities**

This criterion compares the relative impact of the alternatives to general traffic VMT on local surface streets in environmental justice communities. As with the diversion of heavy through trucks, while supportive of the creation of livability communities, diversion of general traffic away from the study corridor such that it would negatively impact existing environmental justice communities represents a detrimental outcome. Conversely, the diversion of general traffic such that there is a reduction in impact to other existing environmental justice communities represents a positive outcome.

The regional network model was applied to determine the change in general traffic VMT in existing environmental justice communities for each alternative. Total non-truck VMT on local surface streets within or adjacent to environmental justice communities during the AM and PM peak hours was extracted from the models of the future 2050 No-Build conditions and each Tier II through truck diversion alternative.

All of the alternatives create an increase in general traffic VMT in the existing EJ communities. The increases created by alternatives W-4 and W-5 are primarily within the environmental justice community in the Marion section of Jersey City that abuts the eastern side of the Route 1&9T corridor between Sip Avenue and Newark Avenue, extending eastward to Garrison Avenue. The increases created by alternatives S-5 and S-6 are primarily along Kennedy Boulevard between Route 440 and Communipaw Avenue.



Since all of the alternatives create a negative impact under this criterion, all of the scores are equal to or less than zero. Alternative W-5 creates the greatest increase in general traffic VMT in environmental justice communities and receives the lowest score. Alternatives S-5 and S-6 create de minimus increases in general traffic VMT and receive the highest score of zero.

### **Criterion 13 - Potential for Air Quality Impacts in EJ Communities**

This criterion compares the potential for shifts in heavy truck and general traffic patterns to result in localized air quality impacts, either positive or adverse, within existing EJ communities. The results of the application of the regional network model in assessment of criteria 11 and 12 were evaluated to identify the potential for each alternative to result in a local air quality impact in the existing environmental justice communities.

Alternatives that were found to increase both heavy truck and general traffic VMT on roadways within or adjacent to existing environmental justice communities were deemed to hold the potential to result in adverse local air quality impacts to those communities (Alternatives W-4 and W-5). These alternatives receive a score of zero. None of the alternatives were found to reduce both heavy truck and general traffic on roadways within or adjacent to existing environmental justice communities offering the potential to result in positive air quality impacts to those communities. No alternative received the maximum score.

For alternatives found to result in an increase in either heavy truck or general traffic VMT, but not both, on roadways within or adjacent to existing environmental justice communities, the potential effect to local air quality cannot be conclusively determined (Alternatives S-5 and S-6). Adverse effects of the increase in VMT in one class of vehicles may potentially be offset by the positive effects of the reduction in VMT of the other class of vehicles. These alternatives receive a score of 50 percent of the maximum score.

It is important to reiterate that the Tier II alternative evaluation process was designed to rank each alternative against the other alternatives for identification of a preferred alternative. Even if an alternative is shown to result in an increase in either heavy truck or general traffic on roadways within or adjacent to EJ communities, further detailed analysis is required to quantify the level of vehicular emissions that would result, and determine if there is an increase in overall emissions.



### **Criterion 14 - Supports Creation of Economic Opportunity**

This criterion assesses the relative potential of the alternatives to leverage the investment in a through truck diversion alternative into direct creation of new jobs in close proximity to existing environmental justice communities. This criterion was applied based upon existence of a specific potential relationship between the alternative and opportunities to generate significant employment in close proximity to existing environmental justice communities.

Alternatives W-4 and W-5 provide enhancements to existing roadway and bridge infrastructure and therefore do not create new or enhanced access to future employment opportunities. These alternatives receive a score of zero. Alternatives S-5 and S-6 in part create a new direct transportation connection between Port Jersey and MOTBY and Doremus Avenue. Doremus Avenue provides access to lands in Newark that have been designated as part of a redevelopment plan adopted by the City of Newark for the creation of port support industries. The newly created port support industry jobs would be within close proximity to the existing environmental justice communities, with Alternatives S-5 and S-6 providing direct access. Alternatives S-5 and S-6 receive the maximum score.

#### **7.2.2.5 Tier II Goal Category 5: Mass Transit System**

Goal category five addressed supportability to mass transit, and was weighted at 15.1%. Three criteria comprised the category, as follows:

### **Criterion 15 - Light Rail Transit Expansion**

This criterion evaluated qualitatively whether or not the alternative appeared likely to be able to physically support light rail transit system expansion in terms of location in relation to potential new light rail transit system alignments. While light rail infrastructure could conceivably be incorporated into these alternatives, none of them would easily connect directly with existing HBLR system components. Therefore, none of the alternatives were considered to be supportive of light rail system expansion.



### **Criterion 16 - BRT Service Expansion**

This criterion evaluated qualitatively whether or not the alternative appeared likely to provide an opportunity to create a new Bus Rapid Transit (BRT) system link between a population center and a likely BRT destination or groups of destinations such as a jobs, tourism or recreation. Alternatives W-4 and W-5 do not follow logical routes for creation of BRT service to connect dense residential centers with transit system hubs or dense employment centers. These alternatives receive a score of zero.

Alternatives S-5 and S-6 provide new or enhanced connections between Jersey City and Newark, affording the potential to create a viable BRT service between these two residential and employment centers. However, construction of dedicated BRT lanes within a tunnel would require significant widening of the tunnel, potentially rendering this alternative financially infeasible. Alternative S-6 received a score of zero. Alternative S-5 received the maximum score.

### **Criterion 17 - Local or Regional Bus Service Expansion**

This criterion evaluated qualitatively whether or not the alternative appeared likely to provide new or enhanced roadways that would support the expansion of new local or regional bus service. Local and regional bus service differs from BRT service in that it does not require dedicated travel lanes for the exclusive use of buses. All of the Tier II alternatives include creation of new or enhancement of existing roadways and travel paths that would serve Jersey City. All of the alternatives were deemed to offer the potential to expand existing local or regional bus service, creating new routes and improving the efficiency of existing routes. All of the alternatives received the maximum score.

#### **7.2.2.6 Tier II Goal Category 6: Access and Leveraging**

Goal category six addressed the ability to access and leverage other local or regional investment, and was weighted at 11.7%. Two criteria comprised the category as follows:



### **Criterion 18 - Potential Port Access Enhancement**

This criterion provides a qualitative basis for evaluation of improvement in access to the ports and between the ports and existing and planned port support industry zones. All of the through truck diversion alternatives sought to provide improved mobility for the movement of freight, whether by truck, rail or barge, to provide a more attractive alternative than the Route 440/Routes 1&9T corridor to trucks. Alternatives W-4 and W-5 provide enhanced access from points north of the Tonelle Circle to Doremus Avenue, which is the primary north/south roadway serving the Newark/Elizabeth seaport complex. Alternatives S-5 and S-6 provide a new direct connection from Global Marine Terminal and MOTBY to Doremus Avenue and the Newark/Elizabeth seaport complex.

Each alternative provides significant enhancement to the accessibility of the area marine terminals by trucks. Additionally, all of the alternatives also provide enhanced access to the lands identified by the City of Newark for the creation of port support industries. All of the alternatives received the maximum score.

### **Criterion 19 - Leverage Other Regional Freight Mobility Improvement Plans**

This criterion provides a qualitative basis for evaluation of the alternatives leveraging of other ongoing infrastructure improvements in the area. Building upon infrastructure investments already being advanced by the NJDOT, the PANYNJ and others maximizes the utility and value of the investments being made. All of the alternatives build upon ongoing infrastructure improvement plans and investments.

Alternatives W-4 and W-5 build upon improvements to Pennsylvania Avenue and Fish House Road, the Central Avenue Interchange with Routes 1&9 T, the Doremus Avenue Interchange with Routes 1&9 T, and NJ Turnpike Interchange 15-E. Alternatives S-5 and S-6 build upon recently completed improvements to Doremus Avenue. The alternatives all received the maximum score.



### 7.2.3 Through Truck Diversion Alternative Ranking

Based upon the scoring of the individual criterion, the alternatives were ranked in terms of the extent to which they meet the goals and objectives of the purpose and need statement. Alternative S-5 received a total evaluation score of 448 of a possible 1,000 points (Table 7.6) and is ranked as the most beneficial through truck diversion alternative with respect to how well it serves the project purpose and need. This is not to say that all aspects of the highest ranked alternative are positive with respect to support for the project purpose and need, but that in the aggregate, Alternative S-5 offers a greater level of benefit than the other Tier II alternatives.

While creating a new route for trucks, Alternative S-5 would not support a modal shift away from trucks for the movement of freight in the region. Alternative S-5 would result in an increase in daily heavy truck VMT in the region (approximately 70,000 daily heavy truck VMT), but would reduce the total regional heavy truck VHT (approximately 68,000 daily heavy truck VHT). Trucks would be attracted to the shorter travel times in exchange for a longer travel distance. A similar shift would result for general traffic, but to a far lesser extent. Automobile daily VMT would increase by approximately 23, but automobile VHT would be reduced by approximately 380 daily. Alternative S-5 would reduce heavy truck VMT along the corridor (approximately 4,100 daily heavy truck VMT) with virtually all of this reduction occurring along Route 440 south of Communipaw Avenue.

Alternative S-5 would offer the potential to incorporate new bike paths and sidewalks along the bridge. These features would support non-motorized transportation between the Western Waterfront and the economic opportunities that will be created by growth in the port support industries in Newark. The potential also exists for incorporation of dedicated BRT lanes on the bridge as well as creation of new bus service between Jersey City and Newark, further supporting the creation of new economic opportunities.

While Alternative S-5 will result in a shifting in truck travel patterns in the Western Waterfront, this shift will not result in an adverse impact to the existing environmental justice communities in Jersey City. While general traffic will increase slightly in the existing environmental justice communities (increase of approximately 165 daily general traffic VMT) this increase will be offset by a reduction in heavy truck traffic (decrease of approximately 5 daily heavy truck VMT).



**Table 7.6: Through Truck Diversion Alternatives - Scoring Summary and Ranking**

Alternative	Rank	Total (out of 1000)	Goal 1: Regional Traffic Flow	Goal 2: Through Truck Diversion	Goal 3: Complete Streets	Goal 4: Environmental Justice	Goal 5: Mass Transit System	Goal 6: Access and Leveraging
Goal Weight (out of 100%)			24.8%	20.0%	12.7%	15.7%	15.1%	11.7%
Alt S-5	1	448	34	0	127	74	96	117
Alt W-4	2	383	-19	153	127	-44	49	117
Alt W-5	3	373	-4	123	127	-38	49	117
Alt S-6	4	273	34	0	0	74	49	117
Maximum Possible Score		1000	248	200	127	157	151	117

Further study and evaluation of Alternative S-5 should be advanced, and may occur on a track separate from the advancement of engineering, design and construction of the Route 440/Routes 1&9T corridor and central intersection alternatives. S-5 is comprised of a new bridge over Newark Bay that connects Route 440 at the southern edge of Jersey City with Doremus Avenue in Newark.<sup>6</sup> The alignment is to the north of the Casciano Bridge and to the south of the Lehigh Valley railroad drawbridge. The bridge connections to Route 440 are designed to attract vehicles with origins or destinations in the Jersey City and Bayonne port areas and points south. The connections on the Newark side are designed to attract vehicles with origins or destinations in Newark and Elizabeth port areas and points west and south. As this study provides only a coarse level of detail with respect to design and alignment of the through truck diversion alternative alignment, additional study should be undertaken to flesh out more precisely the bridge and ramp alignments that create the optimal connections between these origins and destinations. Particularly on the Newark side, additional study is needed to determine the optimal access points. Additional study is also needed to determine economic feasibility and gain better understanding of potential environmental impacts.

While providing a number of benefits in support of the project purpose and need, Alternatives W-4 and W-5 (ranked 2 and 3 respectively) create negative impacts EJ communities. (See Table 7.5) In advancing these alternatives for further study, special attention should be paid to the impacts of Alts W-4 and W-5 on EJ communities. Further, advancement of Alternative W-4

---

<sup>6</sup> Alternatives S-1 through S-4, which expand the capacity of the Casciano Bridge or provide a new bridge between existing segments of the New Jersey Turnpike Hudson Extension, all failed to pass the Tier I screen due to creation of congested conditions in other locations in Jersey City or the region



should incorporate improvements to Doremus Avenue including widening of the roadway and improvement to the existing stormwater drainage system. Other localized roadway network improvements on the roadways connecting to Doremus Avenue such as Avenue P should also be investigated to determine the level of additional benefit that could be achieved.

## **7.3 Corridor Concept Alternatives**

### **7.3.1 Tier I - Supportive and Not Detrimental Outcome Screening**

A number of roadway corridor alternative concepts were developed and evaluated with respect to their ability to meet the project purpose and need, as well as the additional goals and objectives set forth for this project. As with the through truck diversion alternatives, a series of screening assessments was developed and applied to the corridor alternatives to ensure that locally preferred alternatives were supportive of the purpose and need, goals and objectives, and that no adverse impacts would be created in other locations within Jersey City or the region.

It should be noted that the modeling conducted to evaluate the corridor alternatives assumed completion of all of the transportation infrastructure projects in the no build scenario (Table 6.1) but that no through truck diversion alternative was constructed. Most notable in the modeling is the assumption that the rehabilitation and replacement of the Pulaski Skyway will be completed and that the capacity of the Pulaski Skyway to accommodate traffic will remain at its existing level. In addition, the corridor alternatives were designed and evaluated in part for their ability to accommodate anticipated future truck traffic from a traffic flow and noise mitigation perspective should no through truck diversion alternative be constructed. This is not to say that implementation of one or more of the through truck diversion alternatives is not also necessary to enhance and optimize the quality of life and redevelopment potential of lands along the corridor.

Of the twenty-five corridor concept alternatives identified, twenty-three were eliminated by the Tier I screen. Nineteen were screened out based on non-supportive or detrimental impact under two or more criteria. Four were screened out solely by the application of Criterion Number 21 - Violates existing consent decree or interferes with one or more building footprints as delineated in a pre-existing, duly adopted redevelopment plan ordinance. Two alternatives passed through the Tier I screen and were advanced to Tier II (Table 7.7). Following is a



description of the Tier I criteria for through truck diversion concept alternatives and their application.

### **7.3.1.1 Tier I Goal Category 1: Vehicular Operations**

Goal Category 1 addressed the ability of alternatives to support efficient traffic operations and access to neighborhoods along the corridor. Two criteria comprised the category as follows:

#### **Criterion 1 – Does Not Efficiently Accommodate Traffic Flow Through 2050**

This criterion screens out alternatives that do not efficiently accommodate future traffic flow along the corridor. Alternatives that do not provide a sufficient number of travel lanes along the corridor to efficiently accommodate future traffic flow fail to meet the project purpose and need requirement of improving existing and future traffic operations, mobility and accessibility. The resulting traffic congestion would fail to support economic development, growth and the creation of livable communities in the Western Waterfront.

The application of the regional roadway network was used to determine if an alternative provides an adequate number of travel lanes along the length of the corridor to efficiently accommodate the future travel demand. The future year 2050 trip tables were loaded into the model to determine the volume of vehicles that would travel along the corridor. The number of travel lanes required to accommodate the future traffic demand was determined, with alternatives that do not provide an equal or greater number of travel lanes screened out.

Ten of the 25 alternatives were determined to be incapable of accommodating future travel demand, including the no-build scenario, and were screened out from further consideration.

#### **Criterion 2 - Does Not Accommodate Local Deliveries by Truck**

For the purpose of accommodation of local deliveries, this criterion evaluates the ability of alternatives to accommodate the safe and efficient movement of heavy trucks along and across the corridor. While diversion of heavy through trucks from the corridor is required in the



support of livable communities along the corridor, it is recognized that heavy trucks must still be provided access to the neighborhoods along both sides of the corridor to service the residential and commercial development.

Roadway travel lanes and points of access between the corridor and the local street network were developed with consideration of applicable design standards, most notable the NJDOT Roadway Design Guidelines. These guidelines set forth geometric standards that allow for the movement of heavy vehicles as well as automobiles. As all alternative were developed with these guidelines in mind, no alternatives were eliminated from further consideration based upon this criterion.





### 7.3.1.2 Tier I Goal Category 2: Mass Transit

Criteria Category 2 addressed the ability of alternatives to incorporate a range of public transit opportunities to serve the residents, employees and visitors of the Western Waterfront. Three criteria comprised the category as follows:

#### **Criterion 3 - Does Not Accommodate Grade Separated Westward Extension of HBLR Westside Avenue Line Across Route 440**

This criterion evaluates the ability of alternatives to accommodate the planned extension of the HBLR from its current terminus at West Side Avenue westward across Route 440. Provision of a range of public transit opportunities is critical to reducing dependence on the automobile for travel to, from and within the Western Waterfront. Extension of the HBLR is needed to meet the project purpose and need requirement of improving multi-modal mobility.

NJ Transit has completed an alternatives assessment and identified a preferred alternative for this HBLR extension that includes a grade separated crossing of Route 440 adjacent to the intersection with Culver Avenue. It is anticipated that final designs could be developed such that this grade separated crossing could be constructed without being impeded by the configuration of the roadway corridor over which it passes. No alternatives were eliminated from further consideration based upon this criterion.

#### **Criterion 4 - Does Not Accommodate BRT in Dedicated Lanes Along Route 440**

This criterion evaluates the ability of alternatives to accommodate BRT facilities and service along the corridor. Provision of a range of public transit opportunities is critical to reducing dependence on the automobile for travel to, from and within the Western Waterfront. BRT facilities and service are needed to create an efficient public transit connection between the Western Waterfront and Journal Square. Inclusion of a BRT connection to Journal Square is needed to achieve low auto utilization rates in the Western Waterfront and thereby meet the project purpose and need requirement of improving multi-modal mobility, and the associated goal of reducing use of the single occupancy vehicle.

The physical configuration of 14 of the 25 alternatives would preclude the incorporation of dedicated BRT lanes along the corridor. In many of these cases, inadequate width would be



provided to allow a sufficient number of general purpose travel lanes while maintaining adequate space for dedication of one lane in each direction to the exclusive use of BRT vehicles.

**Criterion 5 - Does Not Accommodate Local Bus Operations Along Route 440**

This criterion evaluates the ability of alternatives to accommodate expansion of the local and regional bus operations that service the Western Waterfront. Provision of a range of public transit opportunities is critical to reducing dependence on the automobile for travel to, from and within the Western Waterfront. Expansion of local and regional bus facilities and service throughout the Western Waterfront is needed to meet the project purpose and need requirement of improving multi-modal mobility and achieve low auto utilization rates.

All of the alternatives were developed with physical dimensions to accommodate local and regional buses. No alternatives were eliminated from further consideration based upon this criterion.

**7.3.1.2 Tier I Goal Category 3: Complete Streets**

Criteria Category 3 addressed the ability of alternatives to incorporate the infrastructure and features that constitute a Complete Street under the NJDOT Complete Streets Policy. Four criteria comprised the category as follows:

**Criterion 6 - Does Not Provide Comprehensive Network of Sidewalks**

This criterion evaluates the ability of alternatives to incorporate a comprehensive network of sidewalks along both sides of the corridor with connections to all local streets. Complete Streets requires a network of sidewalks providing pedestrian access to and along all block faces. The ability to walk between neighborhoods (existing and new) supports livability, retail activity, use of mass transit, and achievement of low auto utilization rates.

Only four of the 25 alternatives fail to incorporate a comprehensive network of sidewalks of sufficient width to accommodate projected pedestrian demand as well as sidewalk activities related to the retail and restaurant uses expected to occupy the first floor of the future development along the corridor. These alternatives were screened out and include the No-



Build alternative (B-1), traditional highway improvement (Alternative B-2), construction of a new waterfront highway (Alternative B-3) and the at-grade boulevard alternative with an overall corridor width of 174-feet (Alternative B-4.1).

Alternative B-4.1 provided 10-foot wide sidewalks which would be inadequate to accommodate the anticipated future pedestrian volumes and sidewalk activities such as café seating while still maintaining adequate space for pedestrian travel.

**Criterion 7 - Does Not Provide Comprehensive Network of Bicycle Lanes/Paths**

This criterion evaluates the ability of alternatives to incorporate a comprehensive network of bike paths along both sides of the corridor with frequent crossings of the corridor and connections to all local streets. Complete streets require the inclusion of a network of bicycle facilities to accommodate bicycle use as a mode of travel along the corridor as well as providing access to neighborhoods along the corridor and local destinations such as parks and transit stations. Provision of the facilities to encourage and support extensive bicycle use for travel to, from and within the Western Waterfront supports livability and achievement of low auto utilization rates, and satisfies the purpose and need and associated goals and objectives.

Seven of the 25 alternatives reserve insufficient width to allow for incorporation of a comprehensive network of bicycle facilities along the corridor. These alternatives included the No-Build alternative, traditional highway improvements, construction of a new waterfront roadway corridor and the at-grade boulevard alternatives of 192-foot width or less. These boulevard alternatives would not provide bike paths of adequate width to encourage and accommodate the anticipated future bicycle demand.

The alternatives that envision either depressed through lanes or elevated local lanes (Alternatives B-7 and B-8) would require additional corridor width to be dedicated to the construction of the support structure separating the through and local lanes at different elevations. The need for additional width for roadway structure and supporting features would reduce the space available for construction of two-way bike paths along both sides of the corridor.



### **Criterion 8 - Does Not Accommodate On-Street Parking**

This criterion evaluates the ability of alternatives to incorporate on-street parking along the length of the corridor. On-street parking is critical in supporting the retail and commercial uses expected to occupy the first floor of future development along the corridor. On-street parking also provides traffic noise mitigation and a safety buffer between vehicles in the travel lanes and pedestrians on the sidewalks.

Three of the 25 alternatives would not provide on-street parking in front of each development parcel and were screened out. These alternatives include the No-Build alternative (B-1), traditional highway improvement (Alternative B-2) and construction of a new waterfront highway (Alternative B-3).

### **Criterion 9 - Does Not Accommodate Sidewalk Amenities**

This criterion considers the ability of the alternatives to incorporate meaningful sidewalk amenities along the corridor. In support of sustainability and the creation of livable communities, a meaningful amenity strip is required outside of the vehicular travel way for benches, trees, bike racks, etc. Four alternatives would not provide sidewalk amenities along the entire central section of the corridor and were screened out. Sidewalk amenities are considered essential in the creation of an attractive public realm in support of the envisioned land development along the corridor.

#### **7.3.1.4 Tier I Goal Category 4: Livability**

Criteria Category 4 addressed the ability of alternatives to incorporate infrastructure and features that support livability. Seven criteria comprised the category as follows:

### **Criterion 10 - Does Not Segregate Through Traffic from Local Traffic**

Segregation of through traffic from local traffic increases the efficiency of the through lanes, safety of vehicular local land access, and allows for creation of a calm traffic area alongside the pedestrian area. All of these considerations are supportive of the purpose and need and



associated goals and objectives. Based upon this criterion, five of the 25 alternatives were screened out.

**Criterion 11 - Does Not Segregate/Separate Heavy Through Truck Traffic From Buildings and Public Spaces**

Segregation of heavy through truck traffic from the adjacent land development and public spaces along the corridor is critical in the creation of a traffic-calmed, livable environment.

Segregation of heavy through truck traffic from buildings and public spaces where people congregate is required for the creation of a livable environment. Segregation and spatial separation of heavy through truck traffic reduces noise along the edges of the corridor and is vital in the creation of a calm edge along the corridor that supports livability, and satisfies the purpose and need and associated goals and objectives. Based upon this consideration, seven of the 25 alternatives were screened out from further consideration.

**Criterion 12 - Does Not Support Access to and Utilization of Mass Transit**

Encouraging the use of public transportation is central to the purpose and need statement, and reduces dependence on single occupant automobiles and decreases auto utilization rates, and decreases traffic congestion. Compliance with the NJDOT Complete Streets Policy requires that all forms of public transit be accommodated within the corridor. Providing bicycle and pedestrian linkages to these public transit opportunities is critical in supporting the Jersey City Master Plan goal of reducing dependence on the single occupant vehicle. Three of the alternatives were removed from further consideration based upon this criterion.

**Criterion 13 - Does Not Support Bicycle and Pedestrian Activity**

Provision of efficient, attractive and safe bicycle facilities throughout the corridor is critical in the support of livable communities and reducing dependence on the single occupant automobile. Complete Streets requires the inclusion of a network of sidewalks and bicycle facilities to accommodate walking and bicycle use as modes of transportation along the corridor as well as providing access to neighborhoods along the corridor and local destinations such as parks and transit stations. A comprehensive network of sidewalks and bicycle paths supports livability and achievement of low auto utilization rates, and satisfies the purpose and



need and associated goals and objectives. Five of the 25 alternatives were screened out removed from further consideration based upon this criterion.

**Criterion 14 - Does Not Provide / Enhance Waterfront Access**

Frequent corridor crossings for bikes and pedestrians with links to the Newark Bay and Hackensack River waterfront are necessary to provide or enhance public access to the waterfront. Three of the 25 alternatives would provide infrequent crossings and limited access for to the waterfront from the eastern side of the corridor. These alternatives are comprised of traditional highway type improvements or a new roadway located along the waterfront itself.

**Criterion 15 - Does Not Incorporate Meaningful Gateways**

Attractive Green Gateway features at the northern, southern and western portals to the Western Waterfront support the purpose and need statement because they are a critical component of creating an attractive public realm that is needed to support the anticipated residential, retail and office redevelopment that will result in increases in economic activity and job creation. . These gateways will create a sense of place, and announce to travelers that they have arrived within the Western Waterfront. Three of the 25 alternatives, those that rely upon traditional highway type improvements or a new roadway located along the waterfront would not provide meaningful gateways, and were therefore removed from further consideration.

**Criterion 16 - Does Not Integrate Interconnected Network of Streets with Walkable Block Sizes**

Provision of block sizes that are small enough to facilitate short walking distances between multiple origins and destinations within an area is a necessary condition to support a significant mode shift from auto to mass transit, walking and bicycling. Three of the 25 alternatives, those that rely upon traditional highway type improvements or a new roadway located along the waterfront would not integrate the local street grid, and therefore would not serve to reduce block dimensions. These alternatives were removed from further consideration.

**7.3.1.5 Tier I Goal Category 5: Environmental Impacts**

Criteria Category 5 addressed the potential for alternatives to result in adverse environmental impacts. Five criteria comprised the category as follows:



### **Criterion 17 - Vehicular Roadway Encroaches Upon Lincoln Park Property**

This criterion screens out alternatives that require any new roadway construction within any portion of Lincoln Park in Jersey City. Lincoln Park is part of the Hudson County park system. There appears to be case law that says that county parks commission lands may not be conveyed for non-recreational uses. Sidewalks, bike paths and landscaping deemed to be supportive of and consistent with recreational uses within Lincoln Park. Accordingly, alternatives that avoid roadway encroachment upon Lincoln Park property and provide new bicycle or pedestrian accommodations within Lincoln Park as part of the park's recreational facilities were not screened out.

Additionally, this criterion also screens out alternatives that encroach upon Green Acres lands. Green Acres regulations do not permit diversion of Green Acres lands for roadway purposes when other alternatives that do not require diversion of Green Acres lands exist. Two alternatives which encroaches upon Lincoln Park property and Green Acres lands, were screened out by this criterion.

### **Criterion 18 - Protection / Preservation of Significant Historic Resources**

This criterion screens out alternatives that adversely affect significant historic resources and for which suitable measures to adequately mitigate adverse impact are likely not available. An inventory of significant historic and cultural resources along the corridor was compiled (Chapter 4). The alternatives were developed with an understanding of these constraints, and the desire to avoid demolition or unacceptable modification of a significant historic resource. Only one alternative (B-3) was deemed to result in impacts to an historic resource that could not be mitigated, due to its impact to Lincoln Park. The entirety of Lincoln Park has received an opinion of eligibility for listing on the New Jersey Register of Historic Places from the State Historic Preservation Office.

### **Criterion 19 – Adverse Noise Impacts**

Study of noise levels at select locations along the corridor determined that existing noise levels are generally at the top end of the range of acceptable levels. Federal regulation 23 CFR 772 states that: "Noise impacts occur when the predicted traffic noise levels approach or exceed the noise abatement criteria levels, or when the predicted traffic noise levels substantially exceed the existing noise levels". The New Jersey Department of Transportation (NJDOT) defines noise levels 1 dBA below FHWA's NAC as approaching impact (66 dBA for residential



uses, 71 dBA for commercial uses) and 10 dBA above existing noise levels as a substantial increase. The residential criteria apply to all residential uses, even if they are in a mixed use building.

Creation of a calm, public realm within the edges of the study corridor to support livability requires consideration of the noise levels that would exist in the future. A range of appropriate measures are available for reducing traffic noise and mitigating traffic noise. Noise levels can be reduced along the boulevard edge by such measures as creating a wide boulevard to provide spatial separation between traffic in the through travel lanes and the sidewalks and buildings along the corridor, incorporation of raised medians whose walls act as barriers to tire noise, dense landscaping that further buffers the sidewalks and building areas from traffic noise, and on-street parking along the sidewalks.

Within the central section, a range of alternative boulevard widths and cross sections were identified. At-grade alternatives less than 232 feet wide (alternatives B-4.1, 2 and 3) as well as alternative B-4.5 in width do not provide sufficient spatial separation of through traffic from the sidewalk areas or raised planters and dense landscaping to maintain acceptable noise levels. Alternatives B-5 and B-6 consider construction of new roadways within future neighborhoods and along the waterfront such that additional traffic would be encouraged to travel and generate noise within the neighborhoods.

Nine of the 25 alternatives screened out based upon their inability to provide adequate noise protection to the future sidewalks and neighborhoods.

### **Criterion 20 - Adversely Effects Air Quality**

A screening level analysis was undertaken to identify alternatives that would potentially result in adverse air quality impacts in the study area. Through application of the regional roadway network model, alternatives that would result in increases in vehicle hours of travel (VHT) within the primary investigation area were deemed to hold the potential to result in adverse air quality impacts in the Western Waterfront. Identification of a preferred alternative that does not result in degradation in air quality is critical to creating a livable environment within the Western Waterfront and safeguarding public health. The level of analysis conducted as part of concept development was not sufficient to render a clear determination of whether or not an alternative would result in a significant adverse air quality impact. Therefore, no alternatives were eliminated from further consideration based upon this criterion. Additional analysis was conducted as part of the Tier II evaluation process.



**Criterion 21 - Violates Existing Consent Decree or interferes with one or more building footprint(s) as delineated in a pre-existing duly adopted redevelopment plan ordinance**

A consent decree issued by a federal court restricts the use of the Bayfront site. Alternatives that violate this consent decree were screened out. Additionally, there are two pre-existing duly adopted municipal redevelopment plan ordinances along the corridor (Bayfront I and NJCU West Campus) that delineate the location of building footprints. Alternatives that encroach upon delineated building footprints within these redevelopment plan areas were also screened out. A total of 16 of the 25 alternatives were screened out by this criterion. Alternatives eliminated included relocation of through roadways across Bayfront, which violate both the consent decree and the Bayfront redevelopment plan, and a number of alternatives that require a corridor width in excess of 232 feet, which encroach on delineated building footprints in the Bayfront or NJCU West Campus Redevelopment Plan ordinances.

**7.3.1.6 Tier I Goal Category 6 – Safety**

Criteria Category 4 addressed the ability of alternatives to incorporate infrastructure and features that support safety. Two criteria comprised the category as follows:

**Criterion 22 - Impedes Emergency Vehicle Access**

This criterion considers whether or not emergency responders can physically access all portions of the corridor. Six alternatives include single local lanes that are abutted by landscaping and/or on-street parking and were screened out. Additional alternatives include single local lanes abutted by bike paths. However, the bike lanes are constructed to support occasional use by maintenance vehicles and by emergency response vehicles to get around a potential blockage of the local travel lane.

**Criterion 23 - Does Not Provide Frequent Safe and Convenient Crossing of the Corridor for Pedestrians**

Provision of closely spaced, convenient and safe crossings of the corridor for pedestrians and bicyclists is a key element that is necessary to support the creation of new livable communities along the central section of the corridor, as well as the elimination of unsafe crossing conditions that currently exist along the corridor. All alternatives with the exception of the traditional highway type improvements and the waterfront roadway option incorporate the enhanced local street grid for the central section which increases the number and frequency of signalized



## Route 440/Routes 1&9T Multi-Use Urban Boulevard and Through Truck Diversion Concept Development Study

---

intersections along this portion of the corridor that provide safe opportunities for pedestrian and bicycle crossing within 400 feet of any point along the central section of the corridor. Therefore, 3 of the 25 alternatives were eliminated from further consideration based upon this criterion.



### 7.3.2 Tier II Detailed Evaluation

A total of two (2) corridor alternatives passed the Tier I screening process. These alternatives were advanced for a more detailed analysis under the Tier II screening process in order to determine the comparative utility of the remaining alternatives. The Tier II criteria were developed prior to completion of the Tier I screening, and were designed to provide a quantified comparison of competing alternatives relative to each other. In many instances, particularly in the Tier II evaluation of the through truck diversion alternatives above, the criteria measures change (e.g. change in VMT), in which case the change was relative to the baseline of the no build scenario. For the corridor alternatives, many of the criteria measure absolute value (e.g. average vehicle delay time or average distance), and were compared to the no-build in the final scoring.

As with application of the Tier I criteria, it should be noted that the modeling conducted to evaluate the corridor alternatives advanced to the Tier II detailed evaluation assumed completion of all of the transportation infrastructure projects in the no build scenario (Table 6.1) but that no through truck diversion alternative was constructed. This modeling approach was adopted to ensure evaluation of the future worst case conditions. In addition, the corridor alternatives were designed and evaluated in part for their ability to accommodate anticipated future truck traffic from a traffic flow and noise mitigation perspective should no through truck diversion alternative be constructed. This is not to say that implementation of one or more of the through truck diversion alternatives is not also necessary to enhance and optimize the quality of life and redevelopment potential of lands along the corridor.

A total of twenty (20) individual criteria were established within six (6) overarching goal categories. The relative importance of the goals was quantified by weighting factors that were established by the TAC. The TAC also established weights for the criteria within each goal set (Table 7.8).

Using output from the roadway network and Paramics microsimulation models, as well as qualitative evaluation of specific criteria, a detailed evaluation and ranking of the through corridor alternatives were conducted and prepared (Table 7.9). Following is a description of the Tier II goals and criteria for corridor concept alternatives and their application.



Table 7.8: Central Corridor Concept Alternatives - Tier II Goal and Criterion Weights

Goal	Criteria	Goal Weight	Criterion Weight	Applied Weight
<b>Goal 1: Local Traffic Flow</b>		<b>21.9%</b>		
1	Corridor Traffic Operations Level of Service		100.0%	21.9%
<b>Goal 2: Complete Streets and Pedestrian Safety</b>		<b>18.2%</b>		
2	Bicycle lanes		15.3%	2.8%
3	Sidewalks		17.5%	3.2%
4	Amenity Strip		10.1%	1.8%
5	Landscaping - Total		12.9%	2.3%
6	Landscaping - Buffer Areas		11.2%	2.0%
7	Pedestrian Crossing Distances		18.2%	3.3%
8	Pedestrian Refuge Areas		14.8%	2.7%
<b>Goal 3: Livability</b>		<b>15.3%</b>		
9	Through-Traffic Noise Mitigation A		29.6%	4.5%
10	Through-Traffic Noise Mitigation B		26.2%	4.0%
11	Through-Traffic Noise Mitigation C		23.8%	3.7%
12	Provides Extensive Landscaping		20.4%	3.1%
<b>Goal 4: Environmental Justice</b>		<b>14.8%</b>		
13	Relative Change (Increase or Decrease) in Heavy Truck VMT in EJ Communities		26.2%	3.9%
14	Relative Change (Increase or Decrease) in General Traffic in EJ Communities		16.2%	2.4%
15	Potential for Air Quality Impacts in EJ Communities		24.1%	3.6%
16	Supports Creation of Economic Opportunity		33.6%	5.0%
<b>Goal 5: Transit Supportive</b>		<b>17.4%</b>		
17	HBLR Extension		40.1%	7.0%
18	BRT lanes		29.4%	5.1%
19	Bicycle / Pedestrian Connections to Transit Stations		30.5%	5.3%
<b>Goal 6: Constructability</b>		<b>12.5%</b>		
20	Requires replacement/relocation or extensive shielding of major utility lines		100.0%	12.5%



Table 7.9: Central Corridor Concept Alternatives - Tier II Detailed Assessment Scores

No.	Criterion	Description	INPUT SCORES			Maximum Possible Score	Final Scores	
			Alt B.4-17	Alt B.9	No-Build		Alt B.4-17	Alt B.9
<b>Goal 1: Local Traffic Flow</b>						<b>219</b>	<b>172</b>	<b>219</b>
1	Corridor Traffic Operations Level of Service	Average Vehicle Delay Time Along the Corridor	691	250	2306	219	172	219
<b>Goal 2: Complete Streets and Pedestrian Safety</b>						<b>182</b>	<b>166</b>	<b>180</b>
2	Bicycle lanes	Average of the distance between the nearest bike lanes in each direction to the outer edges of the boulevard in each direction	41	85	1000	28	28	27
3	Sidewalks	Is the recommended minimum width provided	Yes	Yes	No	32	32	32
4	Amenity Strip	Is the recommended minimum width provided	Yes	Yes	No	18	18	18
5	Landscaping - Total	Total square footage of landscape areas along central section of corridor	303600	340000	0	23	21	23
6	Landscaping - Buffer Areas	Average width of landscape areas between through-travel lanes and building face in central section of corridor	6	6	0	20	20	20
7	Pedestrian Crossing Distances	Maximum distance pedestrians would be required to walk without refuge to cross corridor travel lanes	44	33	88	33	26	33
8	Pedestrian Refuge Areas	Total square footage of pedestrian staging space in the medians at a typical intersection	150	200	0	27	20	27
<b>Goal 3: Livability</b>						<b>153</b>	<b>112</b>	<b>153</b>
9	Through-Traffic Noise Mitigation A	Distance between outer edge of through lanes and outer edge of boulevard	26	29	12	45	22	45
10	Through-Traffic Noise Mitigation B	Number of raised planter barriers between outer edge of through lanes and outer edge of boulevard	1	0	0	40	22	40
11	Traffic Noise Mitigation C	On-street parking provided along boulevard	Yes	Yes	No	37	37	37
12	Provides Extensive Landscaping	Does the alternative provide landscaping and plantings throughout the corridor	Yes	Yes	No	31	31	31
<b>Goal 4: Environmental Justice</b>						<b>148</b>	<b>148</b>	<b>142</b>
13	Relative Change (Increase or Decrease) in Heavy Truck VMT in EJ Communities	Relative increase or decrease in Heavy Truck VMT in EJ Communities	52	53	63	39	39	38
14	Relative Change (Increase or Decrease) in General Traffic in EJ Communities	Relative increase or decrease in General Traffic VMT in EJ Communities	558	563	577	24	24	18
15	Potential for Air Quality Impacts in EJ Communities	Does not have the potential for creating significant air quality impacts in EJ Communities that would result from increased congestion and demand volumes.	Yes	Yes	No	36	36	36
16	Supports Creation of Economic Opportunity	Enhances access between EJ communities and future employment opportunities in the Western Waterfront	Yes	Yes	No	50	50	50
<b>Goal 5: Transit Supportive</b>						<b>174</b>	<b>174</b>	<b>174</b>
17	HBLR Extension	Accommodates extension of the HBLR across Route 440	Yes	Yes	No	70	70	70
18	BRT lanes	Accommodates implementation of BRT service in dedicated lanes along Route 440.	Yes	Yes	No	51	51	51
19	Bicycle / Pedestrian Connections to Transit Stations	Comprehensive network of bicycle and pedestrian connections between existing and future neighborhoods and the transit center	Yes	Yes	No	53	53	53
<b>Goal 6: Constructability</b>						<b>125</b>	<b>0</b>	<b>0</b>
20	Requires replacement/relocation or extensive shielding of major utility lines	Linear feet of major utility relocation required	22500	22500	0	125	0	0
						<b>1000</b>	<b>771</b>	<b>868</b>



### **7.3.1.1 Tier II Goal Category 1: Local Traffic Flow**

Goal category one addressed the efficiency of local traffic flow and was weighted at 21.9%. One criterion comprised the category as follows:

#### **Criterion 1 - Corridor Traffic Operations Level of Service**

This criterion compares the alternatives in their ability to provide efficient traffic operations along the corridor. As any alternative that was found to not efficiently accommodate future traffic flow was eliminated from consideration by Tier I, both of the alternatives advanced to Tier II would accommodate traffic flow at acceptable levels of service. This criterion evaluates the relative efficiency of the alternatives based upon a summation of average travel times along the corridor for each alternative. The Paramics microsimulation model was applied, with the average vehicle travel time, inclusive of average stopped delay time extracted for the northbound and southbound directions. Separate extractions were conducted for the local travel lanes and the through lanes. Alternative B-9 would provide the shorter average corridor travel times, due primarily to the lack of traffic signals along the central section through lanes, and received the maximum possible score.

### **7.3.1.2 Tier II Goal Category 2: Complete Streets and Pedestrian Safety**

Goal category two addressed the inclusion of design elements supporting complete streets and safety for pedestrians along and across the corridor, and was weighted at 18.2%. Seven criteria comprise this category as follows:

#### **Criterion 2 - Bicycle lanes**

This criterion compares the alternatives based upon the proximity of the bicycle paths along the corridor to the sidewalks fronting the existing and future neighborhoods along the corridor. While bike paths are necessary to reduce dependence on automobiles as a mode of transportation, placing the bike paths in close proximity to the development along the corridor encourages the use of bicycles for local circulation and access to the existing and future development along the corridor.



Scoring of the alternatives with respect to their provision of bicycle lanes was based upon a comparison of the average distance between the nearest bike lanes in each direction to the outer edges of the boulevard in each direction. A shorter distance between the bike lanes and the boulevard edge on each side was rated as more beneficial, because it indicates greater accessibility to the bike lanes from origin and destination points along the edge of the corridor, and thereby greater utility of the bike lanes as a transportation resource. Under alternative B-9 (through lanes in a depressed tunnel), the bicycle lanes would be constructed along the outside of the local travel lanes as opposed to being located within the median separating the local lanes from the through lanes. As such, the distance between the bike lane and the edge of the corridor would be less under alternative B-9 than B-4.17.

### **Criterion 3 - Sidewalks**

This criterion assesses the adequacy of the width of sidewalks to accommodate future pedestrian volumes as well as providing space for sidewalk amenities related to the first floor development in the buildings along the corridor such as café seating and retail activities. Under both alternatives, sidewalks of a minimum 12-foot width would be provided. This width was identified as the minimum width required to support future activities on the sidewalks based upon a review of sidewalk widths constructed in other areas within Jersey City and other urban areas. Placement of outdoor seating within sidewalks of less than 12 feet in width would not leave adequate space for unimpeded pedestrian movement along the sidewalk. Both alternatives provide sidewalks of at least 12 feet in width along the central section of the corridor, and received the maximum score.

### **Criterion 4 - Amenity Strip**

A sidewalk amenity strip along the outer edge of the sidewalk is required to support livability. The amenity strip provides space for landscaping which creates an attractive and appealing visual environment while buffering the sidewalk and adjacent buildings from traffic noise. In addition, the amenity strip provides space for placement of amenities such as benches, bike racks, sidewalk lighting, wayfinding signs and waste receptacles. These amenities support the creating of a public space where people are encouraged to congregate.

Sidewalk amenity strips with a minimum width of 6-feet are required to accommodate the placement of street furniture such as benches and bike racks. Both alternatives provide six-foot wide sidewalk amenity strip and received the maximum score.



### **Criterion 5 - Landscaping – Total**

This criterion compares the total amount of landscaping provided along the central section of the corridor. Landscaping is necessary to support the creation of livable communities within the Western Waterfront and meets the goals and objectives set forth in the project purpose and need.

Both alternatives provide for significant space for landscaping along the corridor. Alternative B-4.17 accommodates extensive landscaping within multiple median areas segregating local travel lanes from through travel lanes, as well as a center median segregating the northbound and southbound roadways. Alternative B-9 would provide for significant landscaping in the space created above the tunnel housing the through travel lanes.

### **Criterion 6 - Landscaping - Buffer Areas**

This criterion, as originally written compared the average width of landscape area separating the through-travel lanes from the outer edge of the corridor in the central section. As Alternative B-9 places the through travel lanes in a tunnel, this criterion cannot be directly applied as written. Application of this criterion has been modified to compare the width of landscaping visually and spatially buffering the building face at the outer edge of the corridor from the nearest travel lane.

Both alternatives provide a six-foot wide landscaped amenity strip between the sidewalk and the local travel lanes, making the alternatives equivalent in terms of spacing between the nearest travel lane and the sidewalk.

### **Criterion 7 - Pedestrian Crossing Distances**

Encouraging pedestrian activity as a mode of travel requires not only an attractive pedestrian environment, but also incorporation of measures to ensure pedestrian safety. Minimizing the distance pedestrians are required to walk without refuge to cross corridor travel lanes is a key consideration to providing safe crossings of the corridor.

Under the No-Build alternative, pedestrians are required to cross six lanes of traffic plus the shoulders without any refuge area. Under Alternative B-4.17, pedestrians would be required to cross a maximum distance of 44-feet (four 11-foot through travel lanes) between areas of



pedestrian refuge. Alternative B-9 assumes construction of two local travel lanes and a BRT lane in each direction at grade, requiring pedestrians to cross a maximum distance of 33 feet between areas of pedestrian refuge. Alternative B-9 receives the maximum score, while Alternative B-4.17 receives 80 percent of the maximum score.

### **Criterion 8 - Pedestrian Refuge Areas**

This criterion is a measure of the total square footage of pedestrian staging space in the medians at a typical intersection. Due to the width of the corridor alternatives, the incorporation of a dedicated pedestrian phase into the traffic signals to allow a protected pedestrian crossing of the corridor without stopping would reduce the amount of green time at the signal available for vehicle movements to the extent that traffic demand could not be efficiently accommodated. As such, pedestrian refuge areas are incorporated into the alternatives at the signalized intersections.

A minimum of 160-square feet of pedestrian staging space is provided within the medians under Alternative B-4.17. While alternative B-9 places the through travel lanes in a tunnel that prohibits pedestrian crossing, pedestrians will, however, be required to cross the local lanes and the BRT lanes at the signalized intersections. The landscaped areas within the median above the tunnel includes two 20-foot wide landscape strips, providing a minimum of 200 square feet of pedestrian refuge area between the BRT lanes and the bike path within the median. Alternative B-9 receives the maximum score, while Alternative B-4.17 receives a 75 percent of the maximum score.

### **7.3.1.3 Tier II Goal Category 3: Livability**

Goal category three addressed livability, focusing primarily upon the adequacy of the noise buffering provided along the corridor, and was weighted at 15.3%. Four criteria comprise this category as follows:

### **Criterion 9 - Through-Traffic Noise Mitigation – Separation from Traffic Lanes**

This criterion as originally written compared the average width of landscape area separating the through-travel lanes and the outer edge of the corridor in the central section. In the application of this criterion to the two Tier II alternatives, it was determined that it was not



directly applicable to Alternative B-9 which accommodates through traffic within an enclosed tunnel.

Alternative B-9 provides superior noise buffering along the sidewalk by virtue of isolating the through traffic in a tunnel. Therefore, Alternative B-9 was assigned the maximum score. However, assigning Alternative B-4.17 a score of zero gives the inaccurate impression that the no buffering of noise is provided under this alternative. Analysis of future noise level along the corridor (Chapter 12) indicates that future noise levels along the central section will be less than existing noise levels. This is due in part to the spatial separation of the through travel lanes from the outer edge of the corridor. Accordingly, to reflect these benefits, Alternative B-4.17 received 50 percent of the maximum score.

#### **Criterion 10 - Through-Traffic Noise Mitigation – Raised Planters and Landscaping**

This criterion as originally written compared the number of raised planter medians forming a barrier between the through travel lanes and the outer edge of the corridor. Raised planter medians serve to buffer the sidewalks and buildings along the corridor from noise generated by vehicles traveling in the through lanes. In the application of this criterion to the two Tier II alternatives, it was determined that it was not directly applicable to Alternative B-9 which accommodates through traffic within an enclosed tunnel.

As with the application of Criterion 9, it is recognized that Alternative B-9 provides superior noise buffering along the sidewalk by virtue of isolating the through traffic in a tunnel. Therefore, for the purpose of applying this criterion, Alternative B-9 was assigned the maximum score. However, assigning Alternative B-4.17 the maximum score based upon the provision of one raised planter median gives the inaccurate impression that the planter provides the same level of noise mitigation as placing the through lanes in a tunnel. Accordingly, to reflect these benefits, Alternative B-4.17 received 50 percent of the maximum score.

#### **Criterion 11 - Through-Traffic Noise Mitigation – On-Street Parking Buffer**

This criterion recognizes the benefit of on-street parking in buffering of the sidewalk and outer edge of the corridor from traffic noise generated by vehicles traveling in both the through and the local lanes. Creating a calm corridor outer edge and reduction of noise in the areas where people will live, work and congregate is required in the creation of livable communities.



Both alternatives provide on-street parking along the length of the corridor. Each alternative received the maximum score.

### **Criterion 12 - Provides Extensive Landscaping**

This criterion identifies the alternatives that provide extensive landscaping along the central section of the corridor. As noted in the discussion of criterion 5, landscaping is necessary support the creation of livable communities within the Western Waterfront and to meet the goals and objectives set forth in the project purpose and need. Both alternatives provide in excess of 300,000 square feet of landscape area within the central section of the corridor and receive the maximum score.

#### **7.3.1.4 Tier II Goal Category 4: Environmental Justice**

Goal category four addressed issues related to the existing environmental justice communities including changes in traffic volumes, the potential for creation of negative air quality impacts and support for creation of economic opportunity. Goal category four was weighted at 14.8% and comprises four criteria as follows:

### **Criterion 13 - Relative Change (Increase or Decrease) in Heavy Truck VMT in EJ Communities**

This criterion quantifies the change in heavy truck activity on the local surface streets within existing environmental justice communities. While supportive of the creation of livable communities in the Western Waterfront, it is important to avoid altering traffic patterns such that significant volumes of through trucks utilize local streets within existing environmental justice communities instead of utilizing the Route 440/Routes 1&9T corridor.

Both alternatives would result in a minimal reduction in heavy truck VMT in the existing environmental communities. The creation of the local cross street network and additional traffic signal controlled intersections for full-directional access to the Route 440 corridor reduces the distance trucks must travel to access the corridor. Alternative B-4.17 provides the greatest reduction in heavy truck VMT in the existing environmental justice community along the eastern side of Route 440 between the NJ Turnpike and Communipaw Avenue and receives



the maximum score. Alternative B-9 provides only slightly less reduction in heavy truck VMT and receives a score of 98 percent of the maximum score.

**Criterion 14 - Relative Change (Increase or Decrease) in General Traffic in EJ Communities**

As with heavy truck traffic, both alternatives would result in minimal decreases in general traffic VMT in existing environmental justice communities. The creation of the local cross street network and additional traffic signal controlled intersections for full-directional access to the Route 440 corridor reduces the distance trucks must travel to access the corridor. Alternative B-4.17 provides the greatest reduction in general traffic VMT in the existing environmental justice community along the eastern side of Route 440 between the NJ Turnpike and Communipaw Avenue and receives the maximum score. Alternative B-9 provides only slightly less reduction in general traffic VMT and receives a score of 78 percent of the maximum score.

**Criterion 15 - Potential for Air Quality Impacts in EJ Communities**

Since both alternatives would result in minor decreases in both heavy truck and general traffic VMT in existing environmental justice communities. Accordingly, there exists a potential for positive air quality impacts to result. Both alternatives receive the maximum score. It should be noted that continuing reductions in average vehicle emission rates expected in the future due to improved automotive technology would provide further improvements to local air quality in the Western Waterfront, inclusive of the existing environmental justice communities.

**Criterion 16 - Supports Creation of Economic Opportunity**

Both of the alternatives will support and create economic opportunity simply by supporting the land development that is envisioned for the Western Waterfront. In addition, both alternatives provide additional public transit opportunities that will enhance access between EJ communities and the anticipated new jobs within the central section of the Western Waterfront. Both alternatives received the maximum score.

**7.3.1.5 Tier II Goal Category 5: Transit Supportive**

Goal category five addressed supportiveness of mass transit utilization and achievement of low automobile utilization rates. Goal category five was weighted at 17.4% and comprises three criteria as follows:



### **Criterion 17 - HBLR Extension**

This criterion evaluates the ability of alternatives to accommodate the planned extension of the HBLR from its current terminus at West Side Avenue westward across Route 440. Provision of a range of public transit opportunities is critical to reducing dependence on the automobile for travel to, from and within the Western Waterfront. Extension of the HBLR is needed to meet the project purpose and need requirement of improving multi-modal mobility.

NJ Transit has completed an alternatives assessment and identified a preferred alternative for this HBLR extension that includes a grade separated crossing of Route 440 adjacent to the intersection with Culver Avenue. Both alternatives accommodate the NJ Transit Preferred Alternative for the westward extension of the HBLR, and an elevated crossing of Route 440 and received the maximum score

### **Criterion 18 - BRT lanes**

This criterion evaluates the ability of alternatives to accommodate BRT facilities and service along the corridor. Provision of a range of public transit opportunities is critical to reducing dependence on the automobile for travel to, from and within the Western Waterfront. Alternative B-4.17 incorporates dedicated BRT lanes within the through lane section from Kellogg Street to Communipaw Avenue. Alternative B-9 incorporates dedicated BRT lanes above the tunnel. Both alternatives provide BRT stations at multiple locations along the corridor, with pedestrian and bicycle accommodations providing safe access to and from the stations. Both alternatives received the maximum score.

### **Criterion 19 - Bicycle / Pedestrian Connections to Transit Stations**

This criterion addressed the provision of safe and convenient pedestrian and bicycle connections to the transit stations in the Western Waterfront. Providing these connections encourages use of the range of public and mass transit opportunities serving the Western Waterfront and contributes to achievement of the low automobile utilization rates required to support a calm environment and livable communities.

Both alternatives serve the project purpose and need and include a comprehensive network of bicycle and pedestrian connections between existing and future neighborhoods and the planned HBLR station at the north end of Bayfront. Contiguous bicycle lanes are provided along



the length of the corridor with east/west crossings accommodate at all signalized intersections. Similarly, continuous sidewalks are provided along both sides of the corridor with pedestrian crossing accommodations at all signalized intersections. Additionally, both alternatives incorporate bicycle and pedestrian connections to the future Bayfront HBLR station. Both alternatives received the maximum score.

**Criterion 20 - Requires Replacement/Relocation or Extensive Shielding of Major Utility Lines**

As summarized in sections 4.2, there are a number of significant subsurface utilities located within and adjacent to the existing roadway. Due to their age, the most sensitive of these are the 42-inch BMUA water line which runs within the median of the Route 440/Routes 1&9T corridor from Danforth Avenue to Clendenny Avenue, the 48-inch combined sanitary and waste water sewer line which runs within the center median of Route 440 from Danforth Avenue to Clendenny Avenue. These utilities are approximately 100 years old and require replacement as part of any reconstruction of the corridor.

Of particular concern is the 36-inch diameter BMUA sanitary force main (Bayonne MUA) which runs along the corridor just outside of the eastern edge of the existing right of way between Danforth Avenue and Fisk Street. As discussed in section 4.3, additional loads placed upon this force main by the placement of fill to increase the elevation of the corridor will necessitate replacement of this line. Both alternatives raise the boulevard in the central section to an elevation of approximately 14 feet (current elevation ranges from approximately 8.5 to 12 feet in this section) along the force main.

Construction of either alternative will require replacement and shielding of these utilities to prevent damage and disruptions to service in the future. Both alternatives receive a score of zero.



### 7.3.3 Central Corridor Alternative Ranking

Based upon the scoring of the individual criterion, the alternatives were ranked in terms of the extent to which they meet the goals and objectives of the purpose and need statement. Alternative B-9, receiving a total evaluation score of 868 of a possible 1,000 points (Table 7.10), is ranked as the most beneficial alternative for construction as the central section of the Route 440/Routes 1&9T Multi-Use Urban Boulevard. Alternative B-4.17 received a total score of 771 of a possible 1,000 points.

**Table 7.10: Central Corridor Concept Alternatives - Summary of Scoring and Ranking**

Alternative	Rank	Total (out of 1000)	Goal 1: Local Traffic Flow	Goal 2: Complete Streets and Pedestrian Safety	Goal 3: Livability	Goal 4: Environmental Justice	Goal 5: Transit Supportive	Goal 6: Constructability
Goal Weight (out of 100%)			21.9%	18.2%	15.3%	14.8%	17.4%	12.5%
Alt B-4-17	2	771	172	166	112	148	174	0
Alt B-9	1	868	219	180	153	142	174	0
Maximum Possible Score		1000	219	182	153	148	174	125

A differential of 97 points of the maximum possible score of 1,000 points separates the two alternatives. While Alternative B-9 was ranked the highest, there are considerable cost implications to the construction of a tunnel along the length of the central section of the corridor. The significant additional construction and maintenance costs suggest advancing Alternative B-4.17 as the Locally Preferred Alternative.

Construction and maintenance costs for alternative B-4.17 are presented in detail in Section 11 – Economic Feasibility. Construction of the tunnel alternative along the central corridor would likely alter the identification of the preferred alternative for the gateway intersection. In advance of the discussion of the gateway intersection alternatives, it is estimated that construction of a corridor improvement that incorporates the tunnel alternative (B-9) along the central corridor would result in approximately double the construction costs associated with the at-grade boulevard alternative (B-4.17). Therefore, even though the Tier II scoring indicates that B-9 is a generally superior alternative to B-4.17, economic feasibility dictates the selection of B-4.17 as the locally preferred alternative for the corridor.



## 7.4 Gateway Intersection Concepts

### 7.4.1 Tier I - Supportive and Not Detrimental Outcome Screening

For the purposes of this study, the gateway intersection is the junction of Route 440, Routes 1&9T, Communipaw Avenue and Lincoln Highway. The gateway intersection is a critical component of the corridor improvement program necessary to ensure efficient traffic operations to the year 2050.

As discussed in Section 6 – Development of Concept Alternatives, a wide range of gateway intersection concept alternatives were developed and evaluated with respect to their ability to meet the project purpose and need, as well as the additional goals and objectives set forth for this project. As with the through truck diversion and corridor alternatives, a two-tier screening process was developed and applied to determine which alternative would best accommodate the future multi-modal travel demand while supporting the creation of sustainable, livable neighborhoods along the corridor.

Of the thirteen gateway intersection concepts identified, twelve were eliminated by the Tier I screen. All eleven were screened out based on non-supportive or detrimental impact under two or more criteria. One alternative passed through the Tier I screen and was advanced to Tier II (Table 7.12). Following is a description of the Tier I criteria for through gateway intersection alternatives and their application.

A series of screening assessments were developed and applied to the gateway intersection alternatives to ensure that the locally preferred alternative is supportive of the purpose and needs, goals and objectives, and that no adverse impacts would be created in other locations within Jersey City or the region. Of primary importance to the identification of the gateway intersection LPA, the purpose and need statement articulates the need to improve traffic operations and multi-modal mobility and to support and interconnect livable communities.

It should be noted that traffic simulation modeling applied in the screening process assumed that no through truck diversion alternative was constructed. The alternatives were designed and evaluated for their ability to accommodate anticipated future truck traffic should no through truck diversion alternative be constructed. This is not to say that implementation of one or more of the through truck diversion alternatives is not also necessary to enhance the quality of life and redevelopment potential of lands along the corridor.



#### 7.4.1.2 Tier I Goal Category 1

All of the Tier I criteria applied in the assessment of the gateway intersection alternatives were aggregated into a single goal category focused on efficiency of traffic operations, integration of a continuous network of sidewalks and bike paths, creation of a public space, assurance of pedestrian safety and avoidance of adverse impacts to Lincoln Park and historic resources in the area. Ten criteria comprised the Tier I goal category as follows:

##### **Criterion 1 - Does not efficiently accommodate traffic flow through 2050**

This criterion focuses on the ability of the alternative to efficiently accommodate future traffic demand through the intersection. Maintaining efficient traffic operations is critical to maintaining mobility and reducing vehicle emissions and their adverse effects on air quality. If the alternative does not efficiently accommodate traffic demand in the future, it was eliminated from further consideration. Ten of the thirteen alternatives fail to efficiently accommodate traffic demand through the year 2050 and were screened out. Alternatives C-4, 5 and 10 provide efficient traffic operations and were not screened out. Alternatives C-4 and C-5 provide a grade separated single point urban interchange (SPUI). Alternative C-10 provides an elevated traffic circle for left turns with an at-grade intersection.



Table 7.11: Gateway Intersection Alternatives - Tier I Supportive and Not Detrimental Outcome Screening

No.	Screening Criteria	Definition	SCORES FOR CORRIDOR ALTERNATIVES												
			No Build	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8	C-9	C-9A	C-9B	C-10
1	Does not efficiently accommodate traffic flow through 2050	Does the alternative provide for a sufficient number of lanes along the corridor to efficiently accommodate vehicle flow	Fail	Fail	Fail	Fail	Pass	Pass	Fail	Fail	Fail	Fail	Fail	Fail	Pass
2	Does Not Physically Accommodate Truck Movements	Can local trucks traverse the intersection	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
3	Does Not Accommodate Continuous Sidewalks To and Through the Intersection	Does the alternative provide a continuous network of pedestrian facilities through the intersection and into the public space as appropriate	Fail	Fail	Fail	Fail	Pass	Pass	Fail	Fail	Fail	Fail	Fail	Fail	Pass
4	Does Not Accommodate Continuous Bicycle Lanes To and Through the Intersection	Does the alternative provide a continuous network of bicycle facilities through the intersection and into the public space as appropriate?	Fail	Fail	Fail	Fail	Pass	Pass	Fail	Fail	Fail	Fail	Fail	Fail	Pass
5	Does Not Incorporate Meaningful Gateway / Public Space		Fail	Fail	Fail	Fail	Fail	Fail	Pass						
6	Does Not Support Creation of an Accessible Public Realm	Building entrances cannot abut the public realm at the intersection	Fail	Fail	Fail	Fail	Fail	Fail	Pass						
7	Adversely Impacts Lincoln Park	Requires construction of motorized vehicle travelways within Lincoln Park	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
8	Adversely Effects Significant Historic Resources	Require demolition or unacceptable modification of a significant historic resource	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
9	Impedes Emergency Vehicle Access	Physically constricts access for emergency responders to and through the intersection	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
10	Does Not Provide Safe Crossing and Access for Pedestrians and Bicyclists	Incorporates dedicated bike / ped facilities with traffic signal control protection for crossing of vehicular travel lanes	Fail	Pass											
Advance to Tier II ?			No	No	No	No	No	No	No	No	No	No	No	No	Yes



**Criterion 2 - Does Not Physically Accommodate Truck Movements**

As all alternatives were developed with an understanding that the existing and future land development along the corridor would still generate some level of heavy truck traffic, all alternatives were developed so as to eliminate the creation of any height or width restrictions to the movement of heavy trucks to, from and along the corridor. Therefore, no alternatives were screened out eliminated from further consideration based upon this criterion.

**Criterion 3 - Does Not Accommodate Continuous Sidewalks To and Through the Intersection**

Providing a comprehensive and contiguous network of sidewalks along the entire corridor is key in the encouragement of pedestrian activity as a mode of transportation, providing non-automobile access to the transit center anticipated to be constructed on the west side of Route 440, and overall support for sustainable and livable communities. Alternatives C-4, C-5 and C-10 include sidewalks to and through the intersection. All other alternatives were screened out by this criterion.

**Criterion 4 - Does Not Accommodate Continuous Bicycle Lanes To and Through the Intersection**

Providing a comprehensive and contiguous network of bike paths and lanes along the entire corridor is key in the encouragement of pedestrian activity as a mode of transportation, providing non-automobile access to the transit center anticipated to be constructed on the west side of Route 440, and overall support for sustainable and livable communities. Alternatives C-4, C-5 and C-10 include bicycle accommodations to and through the intersection. All other alternatives were screened out by this criterion

**Criterion 5 - Does Not Incorporate Meaningful Gateway / Public Space**

The Central Gateway is a cornerstone in the establishment of a sense of place that defines the Western Waterfront. The intersection of Route 440 / Routes 1&9T with Communipaw Avenue / Lincoln Highway represents a key building block of the vision for the redevelopment of the entire Western Waterfront. The roadway components of the intersection must accommodate vehicular travel demand, while the landscaping and public amenities within and surrounding the intersection must create an attractive public realm and form a focal point of the Western Waterfront, thereby enhancing and supporting a vibrant, livable community.

Alternatives C-1 through C-5 incorporate either a single intersection or a single point interchange with variations on how left turn movements are accommodated. None of these



alternatives would provide adequate space for the incorporation of a contiguous public space, and were therefore eliminated from further consideration. Alternatives C-6 through C-10 all incorporate various forms of traffic circles, all of which allow for the creation of a meaningful public space within the circle.

**Criterion 6 - Does Not Support Creation of an Accessible Public Realm**

This criterion eliminates alternatives that do provide an attractive public realm that is directly accessible from the entrances of adjacent new buildings. This criterion ensures that the locally preferred alternative is in furtherance of the need to support and interconnect growth areas and livable communities along both sides of the corridor; and to support local and regional economic development. Alternatives C-1 through C-5 include either a single intersection or a single point interchange with variations on how left turn movements are accommodated. Under these alternatives entrances to buildings would not abut the public realm at the intersection. Alternatives C-6 through C-10 incorporate various forms of traffic circles, all of which allow for the buildings to abut the circle itself, thereby integrating the building faces and entrances into the public realm created around and within the circle.

**Criterion 7 - Adversely Impacts Lincoln Park**

As with the evaluation of through truck alternatives and corridor alternatives, this criterion screens out alternatives that require any new roadway construction within any portion of Lincoln Park in Jersey City. Lincoln Park is part of the Hudson County park system. There appears to be case law that says that county parks commission lands may not be conveyed for non-recreational uses. Sidewalks, bike paths and landscaping are deemed to be supportive of and consistent with recreational uses within Lincoln Park. Accordingly, alternatives that avoid roadway encroachment upon Lincoln Park property and provide new bicycle or pedestrian accommodations within Lincoln Park as part of the park's recreational facilities were not screened out.

Additionally, this criterion also screens out alternatives that encroach upon Green Acres lands. Green Acres regulations do not permit diversion of Green Acres lands for roadway purposes when other alternatives that do not require diversion of Green Acres lands exist.

All of the alternatives could be constructed in such a way as to avoid encroachment into Lincoln Park. No alternative was screened out based upon this criterion.



### **Criterion 8 - Adversely Effects Significant Historic Resources**

As identified in the investigation of historic and cultural resources (Section 3.4), a number of sensitive resources exist within the study area. The alternatives were developed with an understanding of these constraints, and the desire to avoid demolition or unacceptable modification of a significant historic resource. All of the alternatives could be constructed in such a way as to avoid impacts to significant historic resources. No alternative was screened out based upon this criterion.

### **Criterion 9 - Impedes Emergency Vehicle Access**

Maintaining the ability of emergency vehicles to access all areas within the western waterfront is critical in the maintenance of public safety. All of the alternatives were determined to afford access by emergency service vehicles to all areas of the corridor and adjacent neighborhoods. Therefore, no alternatives were removed from further consideration based upon this criterion.

### **Criterion 10 - Not Provide Safe Crossing and Access for Pedestrians and Bicyclists**

Providing closely spaced, convenient and safe crossings of the corridor for pedestrians and bicyclists is a key consideration in the creation of a livable community that encourages walking and bicycle use instead of reliance on single occupant vehicles. While physical measures may be constructed and traffic signal phasing and timing implemented to accommodate safe crossings of pedestrians and bicyclists, the pedestrian access would come at the expense of traffic operations and mobility for vehicles on the roadway. Alternatives that could not provide both safe pedestrian crossings and efficient traffic operations concurrently were screened out. Only Alternatives C-4, C-5 and C-10 were not screened out by this criterion.

#### **7.4.1 Tier II Detailed Evaluation**

A series of criteria were established for the detailed evaluation and ranking of alternatives that were graduated from the Tier I screening process. A total of eight (8) individual criteria were established within four (4) overarching goal categories. However, only one gateway intersection alternative passed the Tier I screening process, rendering application of the Tier II screening unnecessary. Alternative C-10 supports the goals and objectives of the master plan, meets the project purpose and need, and affords the ability to create a new public space within the intersection area that is fully and safely accessible by pedestrians and bicyclists.



Weights were assigned to each goal category and each criterion within each goal category (Table 7.12). However, only one alternative for the Central Gateway was found to offer significant benefits within the context of this study, without creating any significant detrimental consequences as defined in the Tier I screening criteria (Table 7.11). Application of the Tier II process developed for this alternative was not required since only one alternative was passed through the Tier I screening process. The detailed operational analysis findings are presented in Section 8 – Locally Preferred Alternative.

**Table 7.12: Gateway Intersection Alternatives - Tier II Goal and Criterion Weights**

Goal	Criteria	Goal Weight	Criterion Weight	Applied Weight
<b>Goal 1: Local Traffic Flow</b>		<b>28.8%</b>		
1	Operational Efficiency		100.0%	28.8%
<b>Goal 2: Complete Streets and Pedestrian Safety</b>		<b>25.9%</b>		
2	Bicycle lanes		20.1%	5.2%
3	Sidewalks 1		24.6%	6.4%
4	Sidewalks 2		25.1%	6.5%
5	Pedestrian Crossing Distances		30.2%	7.8%
<b>Goal 3: Livability</b>		<b>23.8%</b>		
6	Public Space		48.3%	11.5%
7	Support new adjacent livable communities that will face the intersection		51.7%	12.3%
<b>Goal 4: Constructability</b>		<b>21.4%</b>		
8	Requires Replacement / Relocation of Major Utility Line(s)		100.0%	21.4%

As presented in detail in Chapter 8, Alternative C-10 provided significant benefit and meets the project purpose and need. Of the twelve Gateway Intersection alternatives identified, only Alternative C-10 provides efficient traffic operations at this critical intersection. All intersection approaches both along the elevated circle and the at-grade intersection passing beneath the circle operate at level of service D or better during the peak travel demand periods. It is important to reiterate that the future travel demand and modeling of the alternatives assumed that none of the through truck diversion alternatives is constructed, and that through trucks will continue to travel along the boulevard and complete street, including traveling through the gateway intersection.



## **Route 440/Routes 1&9T Multi-Use Urban Boulevard and Through Truck Diversion Concept Development Study**

---

A comprehensive network of sidewalks and bike paths are provided on all approaches to the circle, with traffic signals at the intersections around the circle providing safe crossing of the ramps leading to and from the circle, as well as crossings to the center of the circle. The 1.65 acres of space within the circle is constructed as a public park, with connections to the adjacent neighborhoods and the existing Lincoln Park. This park provides an attractive “front yard” to the development around the circle, integrating the circle into the surrounding community and supporting livability in the Western Waterfront.



(This Page Left Intentionally Blank)