4.0 MITIGATION MEASURES

4.1 INTRODUCTION

Where significant adverse impacts are identified, the *CEQR Technical Manual* states that mitigation to reduce or eliminate the impacts to the fullest extent practicable is generally developed and evaluated. This chapter presents a summary of the analyses presented in the preceding chapters for each technical area regarding mitigation measures examined to minimize or eliminate identified potential impacts.

4.2 HISTORIC AND CULTURAL RESOURCES

4.2.1 Year 2015

Fairview Park

As discussed in **Chapter 2.6**, "Historic and Cultural Resources," two sites with historic and cultural resources have been identified within the current location of the proposed Fairview Park:

- *Fairview Prehistoric Site (NYS Site A08501.002815)*. This prehistoric site was located in 1999 during John Milner Associates (JMA) Phase II excavations at the Balthasar Kreischer Estate Ruins Site. Prehistoric material was recovered from a small, 60-foot-by-40-foot area to the southeast of the main house foundation remains and from test units to the northwest and east of the main house foundation. The limited testing conducted to date suggests that at least portions of the prehistoric site retain sufficient integrity to contribute important archaeological data.
- *Balthasar Kreischer Estate (Fairview) Ruins*. Fieldwork at the Kreischer Estate in 1999 identified 18 features (including foundations and mid-Late-19th century and Early-20th century items), including visible surface remains across the estate ruins. The site is historically significant in local terms for its association with the Kreischer Brickworks, the establishment of Kreischerville (Charleston), and other 19th century works that were sponsored by the Kreischer family. The site is also significant as an intact archaeological example of a 19th century elite residence and its associated features.

To avoid impacts on these resources, the proposed Fairview Park has been designed to minimize the potential for adverse impacts to these identified archaeological sites. In the northwest portion of the proposed park where these sites are located, the Fairview Park plan would retain the existing walking trails with minimal changes to any surrounding areas. While the park would include playing fields and other active recreation facilities, they are not planned to be located in this area, and to the greatest extent possible, the park has been designed to avoid major grading and topographic changes that could result in impacts to these resources. With this resource-avoidance design, combined with careful attention to the presence of those resources during construction of other aspects of the park, adverse impacts to these resources due to the proposed park would be avoided.

Retail Site "A"

In addition, as discussed in **Chapter 2.6**, "Historic and Cultural Resources," a prehistoric site was located during the Phase IB survey atop a prominent knoll in the east-central portion of the current Project Area. This approximately 150 foot by 40 foot site, which is considered to be archaeologically significant, is located in Block 7452, Lot 75, the parcel on which Retail Site "A" would be developed.

Development of Retail Site "A," which would include the proposed public library, would have the potential to adversely impact this prehistoric site. Construction activities such as excavation, cutting, filling, grading, grubbing, vegetation-stripping, drainage improvements and subsurface utility installations would create subsurface disturbances that would potentially destroy or severely compromise the integrity of this prehistoric site.

Further archaeological investigation will be required to be undertaken in the parkland and on Retail Site "A" prior to construction or substantial ground disturbing activities. A Scope of Work for archaeological field testing will be prepared and submitted to the New York City Landmarks Preservation Commission (LPC) for review and approval. Remedial measures, including Phase 1B testing, any necessary Phase 2 and 3 investigations, and continued consultation with LPC and/or OPRHP, will be required to be undertaken by the developer(s) through provisions in the contract of sale between NYC and the developer(s).

4.2.2 Year 2020

Construction of the remainder of the Project Area by the year 2020 has the potential to disturb or destroy other prehistoric archaeological sites and areas that possess archaeological potential that have never been surveyed. These resources and the project components that could potentially impact them are noted below:

Englewood Avenue

- *Site A7-MCB-1 (NYS Site A08501.002767)*. This prehistoric site was located during the Phase IB survey on a small, pronounced knoll or hill with a flat summit just south of the proposed route of Englewood Avenue, within the existing Conservation Area. This approximately 65 foot by 25 foot site is considered to be archaeologically significant.
- *Englewood Avenue Extension and Pedestrian/Bicycle Path*. It is possible that remains of prehistoric occupation are present in this 80-foot wide linear corridor. Given the density of prehistoric site locations already identified for this portion of Staten Island, including a site located less than 50 feet south of Englewood Avenue within the Project Area itself, it is possible that intact prehistoric resources are present.

Retail Site "B"

- *Block 7494: Lots 8, 90, 95, 97, and 183 - Retail Site "B"*. It is possible that early features associated with the tenure of the Shea family (ca.1853 -1887) are present on this property and would be disturbed by the development of Retail Site "B." Such features could include wells, cisterns, or privies, in addition to foundation remains of the house itself. It is equally possible that features associated with the tenure of the Beckman family (ca.1887- ca.1917) are present. It is also possible that remains of prehistoric occupation are present on this parcel, given the number of previously identified prehistoric sites and traces of occupation noted in the area.
- *Block 7487, Lot 100 – Retail Site B*. Block 7487, Lot 100 lies in the southwestern portion of the current Project Area. This block has been impacted by recent development, notably the construction of the MTA Bus Depot that fronts on Arthur Kill Road. The bus annex occupies approximately one third of Block 7487. However, the portion of Block 7487 that lies to the south of the bus depot and north of Block 7494 and the areas within the existing sewer easement line running east-west through this section of the Project Area have not been previously surveyed.

Senior Housing Site

- *Fairview Prehistoric Site (NYS Site A08501.002815) and Balthasar Kreischer Estate (Fairview) Ruins,* as discussed under Year 2015 above.

The full potential for Proposed Project components projected for completion by 2020 to result in significant adverse impacts on identified historic or prehistoric resources is not yet known.

At this time, there are no specific development proposals for the Senior Housing Site or Retail Site "B" and future developers will be selected pursuant to a RPF process. Further archaeological investigation will be required to be undertaken by the developer(s) after selection. For all developments in the Project Area to be completed by the year 2020, remedial measures, including Phase 1B testing, any necessary

Phase 2 and 3 investigations, and continued consultation with LPC and/or OPRHP, will be required to be undertaken by the developer(s) through provisions in the contract of sale between NYC and the developer(s).

With these types of mitigation strategies, adverse impacts to these resources could potentially be avoided or substantially minimized.

4.3 NATURAL RESOURCES

In this section, mitigation strategies for impacts to wetlands and habitats, especially habitat bifurcation are discussed. These strategies are appropriate for the build phases and options that impact wetlands and/or bifurcate habitats.

4.3.1 Wetlands

This subchapter identifies the applicable federal and state regulations with respect to wetland mitigation, the various compensatory options, and identification of potential wetland mitigation opportunities in the Development Area.

Federal Mitigation Regulations- Wetlands

Federal Executive Order (EO) 11990 Protection of Wetlands, issued in 1977, is an overall wetlands policy for all agencies managing federal lands, sponsoring federal projects, or providing federal funds to state or local projects. EO 11990 requires that, when a construction project involves wetlands, a finding must be made by the federal agency that there is no practicable alternative to such construction, and that the Proposed Project includes all practicable measures to minimize impacts on wetlands resulting from such use. It requires federal agencies to follow avoidance, mitigation, and preservation procedures, with public input, before proposing new construction in wetlands, and generally requires the minimization of activities in wetlands and coordination with United States Army Corps of Engineers (USACE) regarding wetlands mitigation. If federal funding would be utilized for the Proposed Project, the Proposed Project would need to comply with EO 11990. Wetlands are also regulated under Section 404(b)(1) of the Clean Water Act.

Permits from the USACE for work in and around wetlands would be required; the permits would require compensatory mitigation. Compensatory mitigation is the restoration, establishment, enhancement, or, in certain circumstances, preservation of aquatic resources to offset a proposed project's unavoidable adverse impacts after all appropriate and practicable avoidance and minimization has been achieved (33 Code of Federal Regulations [CFR] Part 332.2). The principal objectives of compensatory mitigation are to replace the functions and values lost from the impacted aquatic resources, and to comply with the goal of no net loss of wetlands.

Wetland Mitigation – Compensatory Options

The USACE and U.S. Environmental Protection Agency (USEPA) joint Compensatory Mitigation for Losses of Aquatic Resources, Final Rule (33 CFR Part 332; 73 Federal Register [FR] 19670, April 10, 2008) establishes a hierarchy of preferred options for providing required compensatory mitigation. This part (33 CFR Part 332) is intended to further clarify mitigation requirements established under USACE and US EPA regulations at 33 CFR Part 320 and 40 CFR Part 230, respectively. The final rule instructs the USACE district engineer to consider the following type and location options in the order presented:

1) Mitigation bank credits – Offsetting anticipated, unavoidable aquatic resource impacts by securing credits from an approved mitigation bank, providing the permitted impacts are located within the service area of the bank and the bank has the appropriate number and resource type of credits available.

2) In-lieu fee program credits – Offsetting anticipated, unavoidable aquatic resource impacts by securing credits from an approved in-lieu fee program, providing the permitted impacts are located within the service area of the program and the program has the appropriate number and resource type of credits available.

3) Permittee-responsible mitigation under a watershed approach – Offsetting anticipated, unavoidable impacts by restoring, establishing, enhancing, or in certain circumstances preserving aquatic resources with the ultimate goal of maintaining and improving the quality and quantity of aquatic resources within the watershed through strategic selection of the mitigation resource type and site location.

4) Permittee-responsible mitigation through on-site and in-kind mitigation – Offsetting anticipated, unavoidable impacts by restoring, establishing enhancing, or in certain circumstances preserving aquatic resources of a similar structural and functional type to the impacted resources, on the same parcel of land as the impact site or on a parcel contiguous to the impact site.

5) Permittee-responsible mitigation through off-site and/or out-of-kind mitigation – Offsetting anticipated, unavoidable impacts by restoring, establishing, enhancing, or in certain circumstances preserving aquatic resources of a different structural and functional type from the impacted resources and/or in a location that is neither on the same parcel of land as the impact site nor on a parcel contiguous to the impacts site.

Currently, there are no wetland mitigation banks within Staten Island. Thus, wetland mitigation generally takes the form of wetland restoration, creation, and/or enhancement. USACE regulations at 33 CFR 332.3(a)(2) stipulate that restoration of existing wetlands generally should be the first option considered. The regulations contend that using restoration "the likelihood of success is greater and the impacts to potentially ecologically important uplands are reduced compared to establishing new wetlands, and the potential gains in terms of aquatic resource functions are greater, compared to enhancement and preservation" (33 CFR 332.3[a][2]).

NYSDEC Mitigation Regulations – Freshwater Wetlands

The Freshwater Wetlands Act (NYS Environmental Conservation Law Article 24) recognizes that wetlands provide a variety of functions and benefits important to the people and environment of New York. The Act requires that wetlands be preserved, protected and conserved "consistent with the general welfare and beneficial economic, social and agricultural development of the state".

To meet the standards in *Freshwater Wetlands Permit Requirements Regulations* (6 NYCRR 663) and receive a freshwater wetland permit, an applicant must perform the following actions**:**

- Demonstrate that impacts to the wetland cannot be avoided entirely;
- Then demonstrate that unavoidable losses or impacts on the functions or benefits of the wetland have been minimized; and
- Finally, fully compensate for (replace) any remaining loss of wetland acreage and function unless it can be shown that the losses are inconsequential or that, on balance, economic or social need for the project outweighs the losses.

The NYSDEC prioritizes wetland mitigation options differently than do the USACE and the USEPA. NYSDEC guidelines (NYSDEC, 1993) specify that preferably compensatory mitigation should be on site. Off-site mitigation, although generally not preferred, is acceptable in some circumstances; notably, when on-site mitigation is not possible or desirable. NYSDEC guidelines on compensatory mitigation specify that the preferred order of compensatory mitigation is wetland restoration, then creation, and finally enhancement. Also, New York State wetland laws do not allow the use of in-lieu fee programs.

The NYSDEC typically regulates a 100-foot adjacent area to NYSDEC-regulated freshwater wetlands. Mitigation is required for impacts to wetlands and the regulated adjacent area; although, impacts to adjacent areas typically require mitigation of a smaller magnitude than wetlands.

NYSDEC-regulated Freshwater Wetlands within the Development Area are Class II Wetlands. As indicted in Part 663: Freshwater Wetlands Permit Requirements "A permit shall be issued only if it is determined that the proposed activity satisfies a pressing economic or social need that clearly outweighs the loss of or detriment to the benefit(s) of the Class II wetland." Thus, the purpose and need for impacts to these wetlands would need to be demonstrated and the project sponsor would need to demonstrate that the loss of functions and value would be minimized and mitigation performed.

Required Mitigation

Table 4-1 identities the anticipated impacts to wetlands and adjacent areas that will require mitigation. It is anticipated that approximately 0.07 acres of NYSDEC- and USACE-regulated wetlands and 0.9 acres of NYSDEC-regulated adjacent areas would require mitigation.

Table 4-1
Estimated impacts to Regulated Wetland Habitats and Adjacent Areas

Wetlands	Retail Site A School, Senior Housing, and Retail Site B	Englewood Avenue	Total Impacts**
NYSDEC-Regulated Wetlands and USACE Jurisdictional Wetlands *	-	0.07	0.07
NYSDEC Regulated Adjacent Area (Wetlands B and C)***	-	0.9	0.89

Notes: * Awaiting concurrence from the USACE on the wetland delineation. It is assumed the USACE would identify wetlands B, C, H, HA, NB, and NW as jurisdictional. The only regulated wetlands to be impacted are Wetlands B and C, which are both NYSDEC-regulated and USACE-jurisdictional wetlands.

** The project would also impact an additional 0.4 acres of isolated (non-jurisdictional) wetlands. These impacts would not require mitigation.

***The regulated adjacent area for Wetlands B and C overlap. It is assumed that in the future the NYSDEC would not count the area of overlap twice in the calculation of required mitigation.

On Site Wetland Mitigation Strategies

Within the Development Area, opportunities for restoration, creation and/or enhancement exist. Wetland restoration opportunities are limited; however, there are creation and/or enhancement opportunities.

It is anticipated that the wetlands impacted by the Proposed Project would require mitigation by the USACE and NYSDEC. These are Wetland C and regulated adjacent areas of Wetlands B and C (see **Figure 2.8-6** provided in **Chapter 2.8**), both of which occur in mature forests. These potential impacts would be associated with the development of Englewood Avenue in the vicinity of these wetlands.

If compensatory mitigation is required, regulatory agencies prefer to have mitigation occur within the same watershed as the impacted wetlands. The ratio of mitigation for regulated wetlands and adjacent areas would be determined in consultation with the regulatory agencies. Currently, the amount of regulated wetlands and adjacent areas that would require mitigation is 0.07 and 0.89 acres, respectively. As noted earlier, other wetlands delineated in the area, may be considered jurisdictional by the USACE. If so, additional wetland mitigation may be required.

Given the sensitive nature of the surrounding forest of wetlands B and C, mitigation would likely not occur in either the CPPSPP or the Conservation Area. However, some mitigation opportunities may exist within the proposed Fairview Park section of the Development Area. In the southern portion of proposed Fairview Park, in the vicinity of Wetland A (see **Figure 4-1)** the land area is of lower elevation than much of the Development Area and it is anticipated that hydrology (e.g., sheet flow, runoff, etc.) could be conveyed to this location. Thus, this area should be examined as a potential candidate for wetland creation on site.

Regulatory agencies typically favor the creation and/or enhancement of wetlands to have the same covertype as the impacted wetlands. Wetlands B and C are forested wetlands; thus, if wetland mitigation is to occur on site, forested wetland creation could be considered. If the utility easement corridor is developed, mitigation for impacts to emergent wetlands would be required. Emergent wetlands too could be created in the area identified in **Figure 4-1**.

The regulatory agencies require post mitigation monitoring for created and/or enhanced of wetlands. Created and/or enhanced forested wetlands usually require longer mitigation monitoring periods than emergent wetlands.

In order to increase the success of the mitigation for forested wetlands, planted trees should be at least 2-inch caliper in size and should use species native to southern Staten Island wetlands (e.g., black gum, swamp white oak, etc.). Also, the wetland mitigation plan should be designed by qualified parties. Prior to planting, the plant stock should be inspected by a qualified individual to ensure the plants are free of disease or injury. The planting of the trees should be overseen by individuals who are thoroughly knowledgeable in the planting of trees in wetlands

While the location and width of its right-of-way is defined, the plans for Englewood Avenue within that area, especially between CPPSPP and the Conservation Area, are conceptual in nature and have not yet reached the design phase. As the design plans for the roadway advance in the future, it is anticipated that there will be opportunities to minimize impacts on these wetland resources. Design measures that will be considered here include, but are not limited to, minimizing the disturbance footprint to the greatest extent practicable, using grates when possible to reduce shading, treatment of stormwater discharges, etc.

4.3.2 Flora and Habitats

Flora

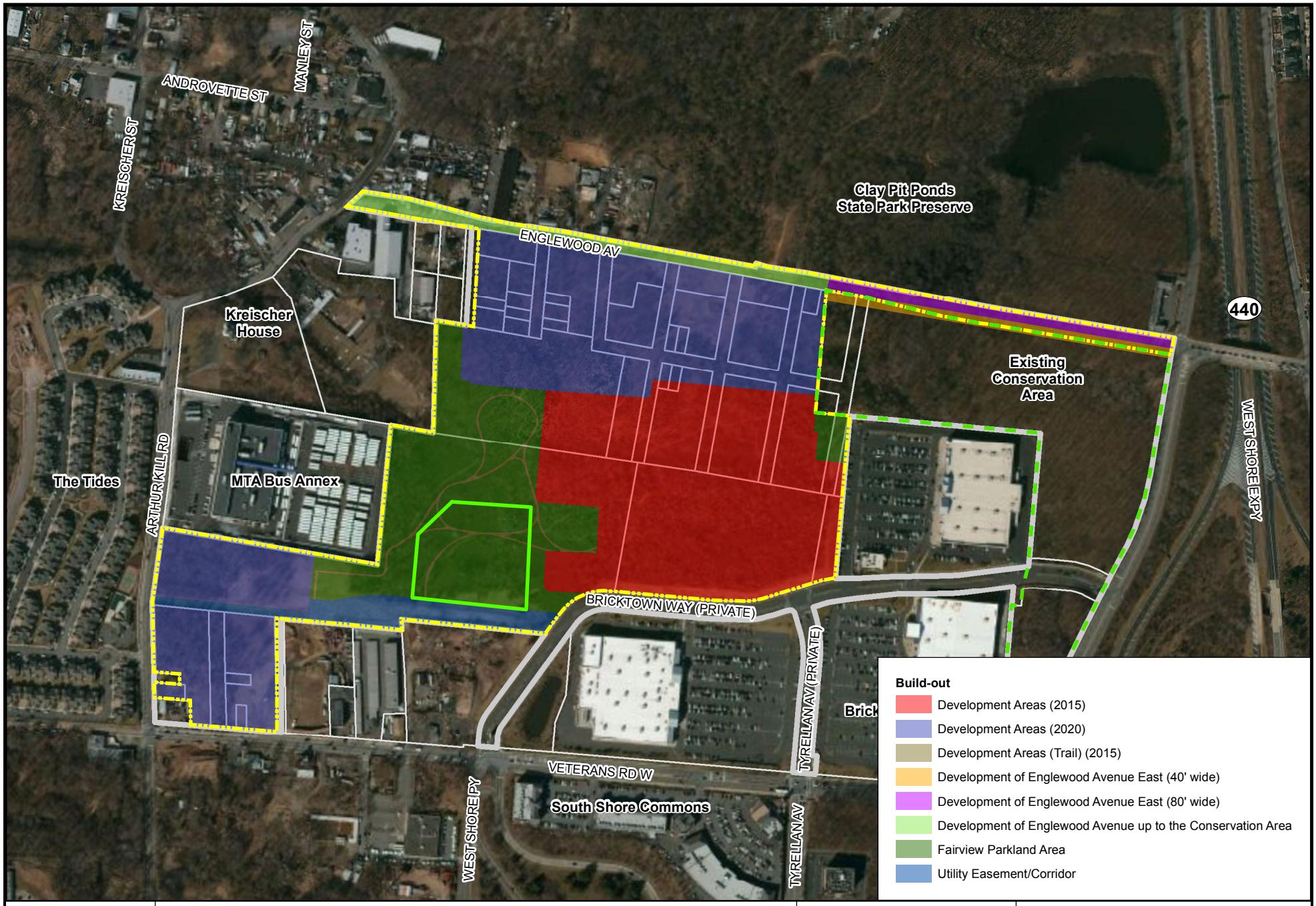
Based on New York City Local Law 3 of 2010, mitigation for trees on NYCDPR property and mapped Right-of-Ways would be required. However, other city agencies also are anticipated to adhere to Local Law 3 and require mitigation for trees on their property. The total amount of mitigation will be determined after an evaluation of each tree to be removed is performed.

Habitats

This section identifies general habitat enhancement recommendations and habitat enhancement opportunities for the area and the development of Englewood Avenue.

General Recommendations

- Hybrid and Rare Species Preservation - A tree survey was performed on site for trees over 6 inches; however, given the potential presence of rare and hybrid species on site, a tree inventory for smaller trees should be performed prior to construction. If rare or unique species are observed, consideration should be given to transplanting them from the build footprint to undeveloped areas on site. Also, seeds from these species should be collected and provided to appropriate parties (e.g., botanists from NYCDPR) for the regeneration of native species.



AECOM

Legend

- Project Area
- Development Area
- Conservation Area
- Property Line
- Area of Potential Wetland Enhancement and/or Creation

Source: Bing Aerial Map.

0 125 250 500 Feet

1 inch = 500 feet

N

Charleston Mixed-Use Development

Figure 4-1

Area of Potential Wetland Creation and Enhancement

- Topsoil Seed Bank Retention - Due to the possibility of the soil retaining seeds from threatened and endangered species (e.g., bonesets), topsoil from the site should be retained for future work on site.

- Vernal Pool Habitat Preservation and/or Creation – Many of the small wetlands on site that will be lost due to construction are small isolated depressions that likely serve as vernal pool habitat in the late winter and early spring. For any wetland habitats that do not occur within the build footprints, a vegetated buffer should remain in place around them. In undeveloped areas on site, especially wooded areas at the base of slopes, shallow depressions should be created, when possible, to recreate the small isolated wetlands that would be removed through the implementation of Retail Sites "A" and "B." These areas should have a vegetated buffer around them. Also, during construction appropriate measures would be taken to ensure that existing vernal pools are not directly or indirectly impacted by construction activities.

- Invasive and Nuisance Species Removal - Restoration activities should include a program for the removal of invasive plants and nuisance species and the reintroduction of native plant species. This should be targeted for recently disturbed habitats, especially along the edges of habitats. Often referred to as the "edge effect", this is when a portion of a habitat is removed and/or altered, the edge of the original habitat is often subjected to a marked change in vegetation composition. Often, the change is attributed to an increase of invasive and nuisance species. The removal of nuisance and invasive species should especially be targeted along Englewood Avenue, and habitats that have little disturbance, unlike the rest of the Development Area.

Development Areas (Excluding Englewood Avenue)

Within the proposed parkland, the adoption of best management practices for control and management of non-native, invasive species would be required to minimize their spread.

Englewood Avenue

Impacts within the build footprint should be minimized to the greatest extent practicable. Due to the likely difference in elevation between the proposed roadway and the existing dirt path roadway in the eastern portion of Englewood Avenue, the elevation of the new road surface would be at least several feet higher than the current dirt road. Underneath the road surface the use of culverts or other structures to allow for the passage of fauna under the roadway without contact with moving vehicles is advisable as part of the eventual design of this roadway.

Wildlife at the Charleston site consists of reptiles, amphibians, small (squirrel, vole, mouse etc.), medium (raccoon, skunk, rabbit, groundhog, and fox) and large (deer) size mammals. The size of the new roadway would likely serve as impediment to travel for smaller fauna (reptiles, amphibians, small mammals). Deer and other larger fauna would be able to cross the road; however, their presence on a city street could present a danger for both deer and motorists. Given that the proposed project will reduce available habitat, there is a strong need to maintain suitable travel ways for organisms between CPPSPP and the Conservation Area.

Research indicates that the most effective size for road crossing structures is highly species-dependent. Design is dependent upon the involved species' ecological requirements, mobility, and general sensitivity. For underpasses, the size of the crossing limits the animal species that can use it and the amount of light in the crossing defines the ability of wildlife to see habitat on the other side of the underpass.

For example, a study of the underpasses in Canada's Banff National Park (McDonald and St.Clair, 2004) found that certain species (typically smaller species) preferred more enclosed passageways as a means of protection against predation, while most predatory species may prefer more open crossings. Climatic conditions, such as light, moisture levels, and temperature are important for some species such as reptiles and amphibians. It is known that moisture levels can affect the movement of some amphibians, such as salamanders (Andrews et. al., 2006). Green frogs have been shown to prefer tunnels with the

greatest light permeability (Woltz, et al., 2008). Additionally, undulates such as deer are sensitive to visibility through crossing structures, preferring to enter those with an unobstructed view (Kintsch and Cramer, 2011).

Deer require the largest crossing structure, recommended as an underpass of the dimensions of a minimum width of 20 ft, with recommendations of 40+ ft and a minimum height of 10 ft, with a recommended height of 15 ft (FHWA, 2011). Additionally, the measure of "openness" has been used to described and measure the stimulus of a given underpass by an approaching deer ([Height x Width]/Length). Suggested openness indices ranged from 0.6 to 1.5 among deer species, although use of these indices is not recommended due to the lack of critical evaluation (FHWA, 2011).

A solution to make crossings function for a variety of species is to make the crossings as large and open as feasible, but provide plenty of cover for smaller animals in the form of vegetation and hollow logs or stumps. Light and vegetation, which affect moisture levels, can be introduced into an underpass through the use of grating or day lighting methods.

These and other conceptual design components to this segment of Englewood Avenue can be further developed as the plans for the roadway advance in the planning and design process, with substantial opportunities to minimize the roadway's habitat impacts. Any plan for underpasses, wildlife crossings, etc. would be performed in consultation with the appropriate regulatory agencies. Also, as stated earlier, a nuisance and invasive species removal program could be targeted along the edges of Englewood Avenue

4.3.3 Threatened and Endangered Species

This section identifies potential mitigation actions for possible impacts to threatened and endangered plant species, and particularly Torrey's Mountain Mint and boneset.

As identified in **Chapter 2.8**, there is a small patch of Torrey's Mountain Mint growing along the edge of an expanding wood line in the southeast portion of Retail Site "A." Below are three mitigation options to offset the potential impacts to this species.

1) Soil Retention and Similar Habitat Development – Ecologists will identify locations in the westernmost portions of Fairview Park or in other suitable locations nearby with a growth habitat (e.g., shading, hydrology, etc.) similar to the area in Retail Site "A" where the Torrey's Mountain Mint was observed. Prior to construction, one or more of these identified preservation areas, which are largely expected to remain vegetated in a natural state, would be set aside and isolated so that soils and existing vegetation are not disturbed. Top soil from the Retail Site "A" location where the species is currently located would be preserved and relocated within the identified preservation area(s), which would be monitored and maintained to ensure proper growing conditions for the species. For the boneset species, a similar program to protect and maintain on-site open field areas, within Fairview Park or elsewhere, of the type that presently provide a suitable habitat for the boneset species within the Development Area.

2) Transplant and Seed Propagation – Ecologists will engage with biologists/horticulturalists to assist with transplanting the species and collecting appropriate cutting and seed stock to grow Torrey's Mountain Mint and bonesets at an appropriate facility (for instance, NYCDPR's Greenbelt Native Plant Center has such capabilities). Once the species is grown, the respective developer or agency would consult with appropriate regulatory agencies for locations to plant the species. It is hoped that species could be grown at the ecologists' facility, with the intention of transplanting those plants to appropriate habitats within Fairview Park or other locations as directed by the regulatory agency(s).

3) Advanced Species Search – Under this mitigation scenario, ecologists, as directed by regulatory agency(s), will survey publically owned parcels (up to 10 acres) to determine if other populations of Torrey's Mountain Mint occur near the site. If observed, the species will be documented and location will be identified to the regulatory agency(s).

Summary of Natural Resource Mitigation Measures

All of the mitigation concepts presented in this section will require further consultation with an agreement from applicable regulatory agencies, including NYSDEC, USACE and NYCDPR. These measures include the following by resource or habitat areas:

- **Wetlands**
  - Wetlands impacted by the Proposed Project (Wetland C and regulated adjacent areas of Wetlands B and C) would have mitigation required by the USACE and NYSDEC, primarily associated with the development of Englewood Avenue in the vicinity of these wetlands.

  - Mitigation would likely not occur in either the CPPSPP or the Conservation Area, but some potential areas may exist within the proposed Fairview Park section of the Development Area, especially near Wetland A. If the utility/roadway easement corridor is developed, mitigation for impacts to emergent wetlands would be required.

  - Proper design of the proposed Englewood Avenue – its alignment, width, and other design elements, would be important to avoiding and mitigating impacts. As the roadway's design plans advance in the future, there would be opportunities to minimize impacts on these wetland resources. Design measures could include, but not necessarily be limited to, minimizing the disturbance footprint to the greatest extent practicable, using grates when possible to reduce shading, and treatment of stormwater discharges from the roadway..

- **Habitat and Flora Preservation**

  - Hybrid and Rare Species Preservation - A tree inventory for smaller trees (less than 6" dbh) should be performed prior to construction, with consideration given to transplanting rare or unique species from the build footprint to undeveloped areas on site, with seeds from these species collected and provided to appropriate parties (e.g., botanists from NYCDPR).

  - Topsoil Seed Bank Retention (see the threatened and endangered species section below)

  - Vernal Pool Habitat Preservation and/or Creation . For any wetland habitats not within the build footprints, a vegetated buffer should remain in place around them. In undeveloped areas, especially wooded areas at the base of slopes, shallow depressions could recreate the small isolated wetlands to be removed through the implementation of Retail Sites "A" and "B." Appropriate measures should be taken during construction to ensure that existing vernal pools are not directly or indirectly impacted by construction activities.

  - Invasive and Nuisance Species Removal – restoration programs should include a program for the removal of invasive plants and nuisance species and the reintroduction of native plant species, especially in recently disturbed habitats and along the edges of habitats

  - Englewood Avenue (portion between CPPSPP and Conservation Area) – the use of culverts or other structures underneath the road surface is recommended to allow for the passage of fauna under the roadway as part of the eventual design of this roadway. Plans for underpasses, wildlife crossings, etc. would be designed in consultation with the appropriate regulatory agencies. A nuisance and invasive species removal program could be targeted along the edges of Englewood Avenue

- **Threatened and Endangered Species**

Potential mitigation measures to address potential impacts to threatened and endangered plant species, specifically Torrey's Mountain Mint (an endangered species on Retail Site "A") and two boneset species

(one threatened, one endangered; found throughout open field areas throughout the Development Area) may include, but are not necessarily limited to the following:

- Soil Retention and Similar Habitat Development:
  - Establish locations in the proposed Fairview Park or in other nearby locations with a growth habitat similar to the area on Retail Site "A" where the Torrey's Mountain Mint was observed, with top soil from that area preserved and relocated within the identified preservation area(s). The area(s) would be monitored and maintained to ensure proper growing conditions for the species.
  - Establish a program to protect and maintain on-site open field areas, primarily within the western portions of Fairview Park or in other suitable locations, of the type that presently provide habitat for boneset within the Development Area.
- Transplant and Seed Propagation – Transplanting the species and collecting appropriate cutting and seed stock to grow Torrey's Mountain Mint and bonesets at an appropriate facility (for instance, NYCDPR's Greenbelt Native Plant Center), and transplanting those plants to appropriate habitats within Fairview Park or other locations once propagated.
- Advanced Species Search – Ecologists would survey publically owned parcels (up to 10 acres) to determine if other populations of Torrey's Mountain Mint occur near the site. If observed, the species will be documented and location will be identified to the regulatory agency(s).

4.4 TRANSPORTATION

This section describes the measures recommended at selected study area intersections to eliminate potential traffic impacts associated with the Proposed Project in the 2015 and 2020 year's analyses, as discussed in **Chapter 2.13**.

According to the thresholds established in the *CEQR Technical Manual*, the following situations represent significant traffic impacts for signalized intersections:

1) If a lane group under the With-Action condition is within LOS "A", "B" or "C" or marginally acceptable LOS "D" (average control delay less than or equal to 45.0 seconds/vehicle) the impact is not considered significant. However, if a lane group under the No-Action condition is within LOS "A," "B" or "C," then a deterioration under the With-Action condition to worse than mid-LOS "D" (delay greater than 45.0 seconds/vehicle) should be considered a significant impact.
2) For a lane group with LOS "D" under the No-Action condition, an increase in projected average control delay of 5.0 or more seconds should be considered significant if the With-Action delay exceeds mid-LOS "D" (delay greater than 45.0 seconds/vehicle).
3) For a lane group with LOS "E" under the No-Action condition, an increase in projected delay of 4.0 or more seconds should be considered significant.
4) For a lane group with LOS "F" under the No-Action condition, an increase in projected delay of 3.0 or more seconds should be considered significant.

For unsignalized intersections, the criteria above also apply. However, for a minor street at an unsignalized intersection to trigger significant impacts, 90 PCEs (passenger car equivalents) must be identified in the Future With-Action conditions in any peak hour.

The criteria described above ensure that the LOS for individual turning movements at each intersection does not degrade significantly under Future With-Action conditions.

4.4.1 Year 2015

The analyses in **Chapter 2.13** indicate that potential significant traffic impacts are projected to occur at the following intersections and traffic movements by time period in 2015:

Allentown Lane-Veterans Road West/Arthur Kill Road:
- Weekday PM peak hour (southbound approach)
- Saturday midday peak hour (southbound approach)

Richmond Valley Road/Arthur Kill Road:
- Weekday midday peak hour (southbound approach)
- Weekday PM peak hour (southbound approach)
- Saturday midday peak hour (southbound approach)

Veterans Road West/Bricktown Way/Korean War Veterans Parkway westbound off-ramp:
- Weekday midday peak hour (eastbound left-turn lane)
- Saturday midday peak hour (eastbound left-turn lane, northbound approach, southbound through/right-turn lane)

Veterans Road West/Tyrellan Avenue:
- Weekday midday peak hour (northbound left-turn movements)
- Weekday PM peak hour (northbound left-turn movements)
- Saturday midday peak hour (northbound left-turn movements).

Boscombe Avenue/Outerbridge Crossing Ramps:
- Weekday midday peak hour (westbound through/left-turn lane, westbound right-turn lane)
- Weekday PM peak hour (westbound right-turn lane, southbound left-turn lane)
- Saturday midday peak hour (westbound through/left-turn lane, westbound right-turn lane)

Boscombe Avenue/Tyrellan Avenue:
- Weekday midday peak hour (southbound right-turn lane)
- Weekday PM peak hour (southbound right-turn lane)
- Saturday midday peak hour (southbound right-turn lane)

Englewood Avenue/Veterans Road West:
- Saturday midday peak hour (westbound left-turn lane).

Englewood Avenue/Veterans Road East:
- Saturday midday peak hour (eastbound through/left-turn lane)

Veterans Road East-Drumgoole Road West/Bloomingdale Road:
- Weekday PM peak hour (northbound left-turn lane)
- Saturday midday peak hour (eastbound right-turn lane, northbound left-turn lane)

Pleasant Plains Avenue-Amboy Road/Bloomingdale Road:
- Weekday AM peak hour (southbound approach)

Based on these potential traffic impacts, the following transportation improvements are recommended:

Allentown Lane-Veterans Road West/Arthur Kill Road:
- During the weekday PM peak hour, reallocate two seconds of green time from the east-west phase to the north-south phase.
- During the Saturday midday peak hour, reallocate two seconds of green time from the east-west phase to the north-south phase.

Richmond Valley Road/Arthur Kill Road:

- Restripe the southbound approach to accommodate one 10-foot left-turn lane and one 10-foot through lane.

Veterans Road West/Bricktown Way/Korean War Veterans Parkway westbound off-ramp:

- During the weekday midday peak hour, reallocate two seconds of green time from the southbound phase to the east-west phase.

  With this mitigation, potential significant traffic impacts are projected to remain at this intersection for the eastbound left-turn movement, the northbound approach, and the southbound through/right-turn lane during the Saturday midday peak hour.

  In addition, further mitigation measures could be provided at this location including the widening and restriping the northbound and eastbound approaches by approximately 10 feet to provide exclusive right turn lanes on both approaches. This proposed mitigation measure is considered a higher cost item as per guidance in the CEQR Technical Manual, and has the potential to fully mitigate the impacts of the proposed project at this intersection. Between the Draft and Final EIS further analysis will be conducted to explore the feasibility of this measure. In order to fully inform consideration of this mitigation measure, and among other things, further analysis will explore: ownership of the land proposed for use in widening the on-ramp, the potential for additional impacts resulting from this proposed measure, overall benefits to the larger traffic network, and cost of construction..

  Furthermore, the New York State Department of Transportation (NYSDOT) has announced that it will implement improvements to the southbound on- and off-ramps on the West Shore Expressway ("WSE") between Bloomingdale Road and Englewood Avenue by 2015. By improving the connection between the southbound WSE and its adjacent service road (Veterans Road West), traffic heading south on the WSE could more easily access the major traffic generators along Veterans Road West (including the Bricktown Center). The projected resultant traffic shifts would reduce the volume of traffic added by the Proposed Project to this intersection, potentially reducing or eliminating the unmitigated traffic impacts noted above. The effects of these announced WSE ramp improvements at this and other study area intersection will be analyzed and presented in the FEIS.

Veterans Road West/Tyrellan Avenue:

- During the weekday midday peak hour, reallocate four seconds of green time from the east-west phase, and six seconds of green time from the north-south phase, to create a separate northbound lagging phase (10 seconds).
- During the weekday PM peak hour, reallocate one second of green time from the east-west phase to the north-south phase.
- During the Saturday midday peak hour, reallocate nine seconds of green time from the east-west phase, and one second of green time from the north-south phase, to create a separate northbound lagging phase (10 seconds).

Boscombe Avenue/Outerbridge Crossing Ramps:

- Modify the traffic signal hardware to provide for a westbound right-turn overlap phase.
- During the weekday midday peak hour, reallocate four seconds of green time from the eastbound phase, 10 seconds of green time from the east-west phase, and two seconds of green time from the north-south phase to create a new westbound lagging phase (16 seconds total).
- During the weekday PM peak hour, reallocate one second of green time from the east-west phase to the north-south phase.
- During the Saturday midday peak hour, reallocate one second of green time from the north-south phase to the east-west phase.

With the improvements described above in place, potential significant traffic impacts are projected to remain for westbound right-turn movements at this intersection during the weekday midday and weekday PM peak hours.

In addition, a further mitigation measure could be provided at this location to include the widening and restriping of the on-ramp to the Outerbridge Crossing to accommodate two lanes. This proposed mitigation measure is considered a higher cost item as per guidance in the CEQR Technical Manual, and has the potential to fully mitigate the impacts of the proposed project at this intersection. Between the Draft and Final EIS further analysis will be conducted to explore the feasibility of this measure. In order to fully inform consideration of this mitigation measure, and among other things, further analysis will explore: ownership of the land proposed for use in widening the on-ramp, the potential for additional impacts resulting from this proposed measure, overall benefits to the larger traffic network, and cost of construction.

Boscombe Avenue/Tyrellan Avenue:

- Modify the traffic signal hardware to provide for a southbound right-turn overlap phase to operate concurrently with a new eastbound-only lagging phase.
- During the weekday midday peak hour, reallocate seven seconds of green time from the east-west phase to the north-south phase.
- During the weekday PM peak hour, reallocate four seconds of green time from the east-west phase to the north-south phase.
- During the Saturday midday peak hour, reallocate 14 seconds of green time from the east-west phase to the eastbound-only lagging phase with a protected southbound right-turn overlap.

Englewood Avenue/Veterans Road West:

- During the Saturday midday peak hour, reallocate one second of green time from the north-south phase to the east-west phase.

Englewood Avenue/Veterans Road East:

- During the Saturday midday peak hour, reallocate three seconds of green time from the northbound phase to the east-west phase.

Veterans Road East-Drumgoole Road West/Bloomingdale Road:

- During the weekday PM peak hour, reallocate one second of green time from the westbound phase to the north-south phase.
- During the Saturday midday peak hour, reallocate three seconds of green time from the eastbound phase, one second of green time from the westbound phase, and five seconds of green time from the north-south phase to create a northbound lagging phase with an eastbound right-turn overlap (nine seconds total).

Pleasant Plains Avenue-Amboy Road/Bloomingdale Road:

- During the weekday AM peak hour, reallocate one second of green time from the east-west phase to the north-south phase.

The improvement measures stated above are designed to accommodate the future traffic volumes projected to occur on the roadway network during critical periods of peak traffic activity under the future With-Action condition, specifically during the peak 15-minute periods, by the 2015 year. The resulting year 2015 Mitigated With-Action condition operational performance measures with the improvement measures identified above are shown in **Table 4-2**.

Potential Traffic Mitigation Measures due to Proposed West Shore Expressway Ramp Improvements

As discussed in **Chapter 2-13**, NYSDOT plans to improve the southbound West Shore Expressway (WSE) ramp system and adjacent intersections north of Englewood Avenue just north of the Project Area by the end of 2014. The impacts of these ramps on traffic conditions will be analyzed in the FEIS when sufficient program information is available. Until results from those studies are available, it is

conservatively assumed that ramp-related increases in traffic volumes at the following three intersections would potentially worsen already identified significant traffic impacts and/or create additional significant impacts in one or more peak hour in 2015:

- Veterans Road West/Englewood Avenue (mitigation required in the Saturday peak hour in 2015 in the absence of these ramp improvements is shown above for this location).
- Bricktown Way/Veterans Road West (no mitigation required in 2015 in the absence of these ramp improvements).
- Arthur Kill Road/Bloomingdale Road (no impacts projected in 2015 in the absence of these ramp improvements).

Based on projected 2015 With-Action traffic conditions at these locations without the proposed ramps, it is projected that mitigation actions such as signal timing and phasing adjustments and traffic lane channelization would be sufficient to address any significant traffic impacts that would potentially occur at these locations due to these ramps. The traffic impacts in 2015 of these proposed ramps and the need for any new or additional mitigation will be assessed in the FEIS.

Traffic Mitigation Monitoring Plan

After completion and occupation of the approximately 195,000 sq. ft. of proposed retail within Site "A," NYCEDC will conduct a traffic monitoring plan at the two intersections where significant unmitigable traffic impacts due to the Proposed Project are projected in 2015: (1) Boscombe Avenue/Outerbridge Crossing Ramps, and (2) Veterans Road West/Bricktown Way/Korean War Veterans Parkway westbound off-ramp. This monitoring plan will include a full traffic inventory at those two locations in the relevant peak traffic periods. Using those data, updated Level of Service (LOS) analyses for those locations will be performed and the resultant volumes and LOS conditions will then be compared with the 2015 With-Action conditions projected in the FEIS. This comparison will demonstrate one of the following:

- The mitigation measures included in the FEIS for these locations (or similar measures refined to reflect these updated traffic analyses) were found sufficient to reasonably mitigate the Proposed Project's traffic impacts. Under these findings, a similar mitigation monitoring plan would be carried out upon completion and occupation of the entire Proposed Project to confirm if further mitigation at one or both of these two locations would be warranted at that time.
- The volumes and delays associated with the unmitigated traffic impacts projected in the FEIS at these locations were confirmed, and further mitigation to address these conditions would be identified. Under these findings, no further mitigation monitoring at these locations would be required.

NYCEDC would be responsible for all costs associated with the monitoring plan. Before commencing the monitoring plan, the NYCEDC will submit a scope of work to NYCDOT for review and approval and for review of the plan's results and recommendations.

4.4.2 Year 2020

The analyses in **Chapter 2.13** indicate that potential significant traffic impacts are projected to occur at the following intersections and traffic movements by time period in 2020:

Allentown Lane-Veterans Road West/Arthur Kill Road:
- Weekday AM peak hour (southbound approach)
- Weekday midday peak hour (southbound approach)
- Weekday PM peak hour (southbound approach)
- Saturday midday peak hour (southbound approach)

Richmond Valley Road/Arthur Kill Road:
- Weekday midday peak hour (southbound approach)
- Weekday PM peak hour (southbound approach)
- Saturday midday peak hour (southbound approach)

Veterans Road West/Bricktown Way/Korean War Veterans Parkway westbound off-ramp:

- Weekday AM peak hour (westbound left-turn lane)
- Weekday midday peak hour (eastbound left-turn lane, westbound left-turn lane, , northbound approach)
- Weekday PM peak hour (northbound approach)
- Saturday midday peak hour (eastbound left-turn lane, westbound left-turn lane, northbound approach, southbound through/right-turn lane)

Veterans Road West/Tyrellan Avenue:

- Weekday midday peak hour (northbound left-turn movements)
- Weekday PM peak hour (northbound left-turn movements)
- Saturday midday peak hour (westbound left-turn movements, northbound left-turn movements)

Boscombe Avenue/Outerbridge Crossing Ramps:

- Weekday AM peak hour (westbound right-turn lane)
- Weekday midday peak hour (westbound through/left-turn lane, westbound right-turn lane)
- Weekday PM peak hour (eastbound left-turn lane, westbound right-turn lane, southbound left-turn lane)
- Saturday midday peak hour (eastbound left-turn lane, westbound through/left-turn lane, westbound right-turn lane)

Boscombe Avenue/Tyrellan Avenue:

- Weekday midday peak hour (southbound right-turn lane)
- Weekday PM peak hour (southbound right-turn lane)
- Saturday midday peak hour (southbound right-turn lane)

Englewood Avenue/Veterans Road West:

- Weekday AM peak hour (westbound left-turn lane)
- Weekday midday peak hour (westbound left-turn lane)
- Weekday PM peak hour (westbound left-turn lane)
- Saturday midday peak hour (westbound left-turn lane)

Englewood Avenue/Veterans Road East:

- Weekday PM peak hour (eastbound through/left-turn lane)
- Saturday midday peak hour (eastbound through/left-turn lane)

Veterans Road East-Drumgoole Road West/Bloomingdale Road:

- Weekday AM peak hour (eastbound right-turn lane, northbound left-turn lane)
- Weekday midday peak hour (eastbound right-turn lane, northbound left-turn lane)
- Weekday PM peak hour (eastbound right-turn lane, northbound left-turn lane)
- Saturday midday peak hour (eastbound right-turn lane, northbound left-turn lane)

Pleasant Plains Avenue-Amboy Road/Bloomingdale Road:

- Weekday AM peak hour (southbound approach)
- Weekday PM peak hour (southbound approach)
- Saturday midday peak hour (southbound approach)

Arthur Kill Road/Bloomingdale Road:

- Weekday PM peak hour (westbound approach, northbound approach)
- Saturday midday peak hour (westbound approach)

Sharrotts Road/Arthur Kill Road:

- Saturday midday peak hour (eastbound approach, westbound approach)

Englewood Avenue/Arthur Kill Road:

- Weekday AM peak hour (westbound approach)
- Weekday PM peak hour (westbound approach)

Based on these potential traffic impacts, the following transportation improvements are recommended:

Allentown Lane-Veterans Road West/Arthur Kill Road:

- Restripe the southbound approach to accommodate one 10 foot exclusive left-turn lane and one 11-foot shared through/right-turn lane.
- Restripe the northbound approach to accommodate one 12 foot shared through/left-turn lane and one 12-foot exclusive right-turn lane.
- During the weekday AM peak hour, reallocate one second of green time from the east-west phase to the north-south phase.

Richmond Valley Road/Arthur Kill Road:

- Restripe the southbound approach to accommodate one 10-foot left-turn lane and one 10-foot through lane (same as in 2015).

Veterans Road West/Bricktown Way/Korean War Veterans Parkway westbound off-ramp:

- During the weekday AM peak hour, reallocate two seconds of green time from the southbound phase to the east-west phase.
- During the weekday midday peak hour, reallocate three seconds of green time from the southbound phase to the east-west phase.

  With the improvements described above in place, potential significant traffic impacts at this intersection are projected to remain for:

  - Westbound left-turn movements during the weekday midday and Saturday midday peak hours;
  - The northbound approach during the weekday midday, weekday PM, and Saturday midday peak hours; and
  - Eastbound left-turn movements and the southbound though/right-turn lane during the Saturday midday peak hour.

  In addition, further mitigation measures could be provided at this location including the widening and restriping the northbound and eastbound approaches by approximately 10 feet to provide exclusive right turn lanes on both approaches. This proposed mitigation measure is considered a higher cost item as per guidance in the CEQR Technical Manual, and has the potential to fully mitigate the impacts of the proposed project at this intersection. Between the Draft and Final EIS further analysis will be conducted to explore the feasibility of this measure. In order to fully inform consideration of this mitigation measure, and among other things, further analysis will explore: ownership of the land proposed for use in widening the on-ramp, the potential for additional impacts resulting from this proposed measure, overall benefits to the larger traffic network, and cost of construction.

  Furthermore, as discussed above under Year 2015, improvements to the southbound on- and off-ramps on the WSE are projected to result in traffic shifts that would reduce the volume of traffic added by the Proposed Project to this intersection, potentially reducing or eliminating the unmitigated traffic impacts noted above. The effects of these announced WSE ramp improvements at this and other study area intersection will be analyzed and presented in the FEIS.

Veterans Road West/Tyrellan Avenue:

- Eliminate a portion of the raised median on the southbound and eastbound approaches to accommodate one exclusive left-turn lane on each approach.

- During the weekday midday, weekday PM, and Saturday midday peak hours, modify the signal phasing to create a lagging westbound phase, and three phases for northbound and southbound movements: a southbound leading phase, a concurrent north-south phase, and a lagging northbound phase.
- During the weekday midday peak hour, allocate 10 seconds to the westbound lagging phase, 16 seconds to the southbound leading phase, 17 seconds to the concurrent north-south phase, and 19 seconds to the lagging northbound phase.
- During the weekday PM peak hour, allocate 10 seconds to the westbound lagging phase, 16 seconds to the southbound leading phase, 17 seconds to the concurrent north-south phase, and 19 seconds to the lagging northbound phase.
- During the Saturday midday peak hour, allocate 11 seconds to the westbound lagging phase, 18 seconds to the southbound leading phase, 17 seconds to the concurrent north-south phase, and 16 seconds to the lagging northbound phase.

Boscombe Avenue/Outerbridge Crossing Ramps:

- Modify the traffic signal hardware to provide for a westbound right-turn overlap phase.
- During the weekday midday peak hour, reallocate one second of green time from the north-south phase to the east-west phase.
- During the Saturday midday peak hour, reallocate two seconds of green time from the southbound phase to the east-west phase.

  With the improvements described above in place, potential significant traffic impacts at this intersection are projected to remain for:

  - Westbound right-turn movements during the weekday AM, weekday midday, and weekday PM peak hours; and
  - Eastbound left-turn and southbound left-turn movements during the weekday PM peak hour.

  In addition, a further mitigation measure could be provided at this location to include the widening and restriping of the on-ramp to the Outerbridge Crossing to accommodate two lanes. This proposed mitigation measure is considered a higher cost item as per guidance in the CEQR Technical Manual, and has the potential to fully mitigate the impacts of the proposed project at this intersection. Between the Draft and Final EIS further analysis will be conducted to explore the feasibility of this measure. In order to fully inform consideration of this mitigation measure, and among other things, further analysis will explore: ownership of the land proposed for use in widening the on-ramp, the potential for additional impacts resulting from this proposed measure, overall benefits to the larger traffic network, and cost of construction.

Boscombe Avenue/Tyrellan Avenue:

- Modify the traffic signal hardware to provide for a southbound right-turn overlap phase to operate concurrently with a new eastbound-only lagging phase.
- During the weekday midday peak hour, reallocate 17 seconds of green time from the east-west phase to the lagging eastbound phase with the southbound right-turn overlap.
- During the weekday PM peak hour, reallocate 16 seconds of green time from the east-west phase to the lagging eastbound phase with the southbound right-turn overlap.
- During the Saturday midday peak hour, reallocate 19 seconds of green time from the east-west phase to the lagging eastbound phase with the southbound right-turn overlap.

Englewood Avenue/Veterans Road West:

- During the weekday AM peak hour, reallocate five seconds of green time from the north-south phase to the east-west phase.
- During the weekday midday peak hour, reallocate four second of green time from the north-south phase to the east-west phase.

- During the weekday PM peak hour, reallocate two seconds of green time from the north-south phase to the east-west phase.
- During the Saturday midday peak hour, modify the traffic signal phasing to accommodate a lagging westbound phase. Reallocate six seconds of green time from the north-south phase, plus six seconds of green time from the east-west phase, to the lagging westbound phase (12 seconds total).

Englewood Avenue/Veterans Road East:

- During the weekday PM peak hour, reallocate one second of green time from the northbound phase to the east-west phase.
- During the Saturday midday peak hour, reallocate five seconds of green time from the northbound phase to the east-west phase.

Veterans Road East-Drumgoole Road West/Bloomingdale Road:

- Prohibit on-street parking on the west side of Bloomingdale Road between Veterans Road East and Churchill Avenue, and restripe the southbound approach to accommodate one 12-foot through lane and one 12-foot through/right-turn lane.
- During the weekday AM peak hour, reallocate two seconds of green time from the westbound phase to the eastbound phase, and reallocate 10 seconds from the north-south phase to create a northbound lagging phase with an eastbound right-turn overlap.
- During the weekday midday peak hour, reallocate two seconds of green time from the westbound phase to the eastbound phase.
- During the weekday PM peak hour, reallocate one second of green time from the westbound phase to the eastbound phase.
- During the Saturday midday peak hour, reallocate one second of green time from the westbound phase, plus three seconds of green time from the north-south phase, to the eastbound phase (four seconds total).

Pleasant Plains Avenue-Amboy Road/Bloomingdale Road:

- During the weekday AM peak hour, reallocate three seconds of green time from the east-west phase to the north-south phase.
- During the weekday PM peak hour, reallocate one second of green time from the east-west phase to the north-south phase.
- During the Saturday midday peak hour, reallocate one second of green time from the east-west phase to the north-south phase.

Arthur Kill Road/Bloomingdale Road:

- Restripe the westbound approach to accommodate one 11-foot exclusive left-turn lane and one 11-foot exclusive through lane.
- During the weekday PM peak hour, reallocate 13 seconds of green time from the east-west phase to create a 10-second lagging westbound phase, and add three seconds of green time to the northbound phase.
- During the Saturday midday peak hour, reallocate 17 seconds of green time from the east-west phase to create a lagging westbound phase.

Sharrotts Road/Arthur Kill Road:

- The Proposed Project is projected to result in a marginally unmitigable impact on the eastbound and westbound approaches at this stop-controlled intersection during the Saturday midday peak hour, according to CEQR criteria. However, the delays at this intersection are projected to exceed the CEQR threshold of mid-LOS “D” by only 5.0 seconds on the stop-controlled eastbound approach, and by only 0.3 seconds on the stop-controlled westbound approach, and only during the Saturday midday peak hour. Furthermore, all approaches at the intersection will operate under capacity with delays corresponding to LOS “D” or better—which represents an acceptable operational level for an unsignalized intersection—during all four peak hours analyzed. Therefore, no

mitigation measures are proposed at this intersection for the potential significant traffic impact identified during the Saturday midday peak hour, and a marginally unmitigable impact will remain during that hour.

Englewood Avenue/Arthur Kill Road:

- Restripe the westbound approach to accommodate one exclusive left-turn lane and one exclusive right-turn lane.

The improvement measures stated above are designed to accommodate the future traffic volumes projected to occur on the roadway network during critical periods of peak traffic activity under the future with the Proposed Project condition; specifically, during the peak 15-minute periods, by the 2020 year. The resulting year 2020 Mitigated With-Action condition operational performance measures with the improvement measures identified above are shown in **Table 4-3**.

Potential Traffic Mitigation Measures due to Proposed West Shore Expressway Ramp Improvements

As discussed above under planned 2015 traffic mitigation measures, NYSDOT plans to improve the southbound West Shore Expressway (WSE) ramp system by the end of 2014, with the impacts of these ramps on traffic conditions to be analyzed for the FEIS. Until results from those studies are available, it is conservatively assumed that ramp-related increases in traffic volumes at the following three intersections would potentially worsen significant traffic impacts already identified and/or create additional significant impacts in one or more peak hour in 2020:

- Veterans Road West/Englewood Avenue (mitigation required in all four peak hours in 2020 in the absence of the ramp improvements is shown above for this location).
- Bricktown Way/Veterans Road West (mitigation required in 2020 in all four peak hours in 2020 in the absence of the ramp improvements is shown above for this location).
- Arthur Kill Road/Bloomingdale Road (mitigation required in 2020 in the Weekday AM and PM peak hours in the absence of the ramp improvements is shown above for this location).

Based on projected 2020 With-Action traffic conditions at these locations without the proposed ramps, it is projected that mitigation actions such as signal timing and phasing adjustments and traffic lane channelization would be sufficient to address any significant traffic impacts that would potentially occur at these locations due to these ramps. The traffic impacts in 2020 of these proposed ramps and the need for any new or additional mitigation will be assessed in the FEIS.

Traffic Mitigation Monitoring Plan

After completion and occupation of the entire Proposed Project, NYCEDC will conduct a traffic monitoring plan for those intersections where:

- significant unmitigable traffic impacts due to the Proposed Project are projected under 2020 With-Action conditions – i.e., Boscombe Avenue/Outerbridge Crossing Ramps, and Veterans Road West/Bricktown Way/Korean War Veterans Parkway westbound off-ramp, and
- the results of the monitoring plan studies previously completed for these locations upon full occupancy of the retail on Site “A” indicated that a follow-up monitoring assessment was necessary upon completion of the entire Proposed Project.

For the locations where this follow-up monitoring plan is warranted, the results of the plans updated traffic assessment would indicate the following:

- The mitigation measures included in the FEIS for these locations (or similar measures refined to reflect the updated traffic analyses) upon completion of the entire Proposed Project would be sufficient to reasonably mitigate the Proposed Project’s traffic impacts.

- The volumes and delays associated with the unmitigated traffic impacts projected for 2020 in the FEIS were found to have actually occurred and further mitigation to address these newly measured conditions would be required.

NYCEDC would be responsible for all costs associated with the monitoring plan. Before commencing the monitoring plan, the NYCEDC will submit a scope of work to NYCDOT for review and approval and for review of the plan's results and recommendations.

Conclusion

With the recommended transportation system improvement measures identified above in place, no significant adverse traffic impacts would occur as a result of the Proposed Project in the 2015 or 2020 analysis years, with the exception of the following locations for the horizon years, movements/approaches, and peak hours noted:

Veterans Road West/Bricktown Way/Korean War Veterans Parkway westbound off-ramp:

- In 2015, unmitigable potential significant traffic impacts are projected to remain for eastbound left-turns, the northbound approach, and the southbound through/right-turn lane during the Saturday midday peak hour.
- In 2020, unmitigable potential significant traffic impacts are projected to remain for westbound left-turns during the weekday midday and Saturday midday peak hours, the northbound approach during the weekday midday, weekday PM, and Saturday midday peak hour, and eastbound left turns and southbound through/right-turn lane during the Saturday midday peak hour.

Boscombe Avenue/Outerbridge Crossing Ramps*:*

- In 2015, unmitigable potential significant traffic impacts are projected to remain for westbound right-turns during the weekday midday and PM peak hours.
- In 2020, unmitigable significant traffic impacts are projected to remain for westbound right-turns during the weekday AM, weekday midday, and weekday PM peak hours, and for eastbound left-turns and southbound left-turns during the weekday PM peak hour.

In addition, a further mitigation measure could be provided at this location to include the widening and restriping of the on-ramp to the Outerbridge Crossing to accommodate two lanes. This proposed mitigation measure is considered a higher cost item as per guidance in the CEQR Technical Manual, and has the potential to fully mitigate the impacts of the proposed project at this intersection. Between the Draft and Final EIS further analysis will be conducted to explore the feasibility of this measure. In order to fully inform consideration of this mitigation measure, and among other things, further analysis will explore: ownership of the land proposed for use in widening the on-ramp, the potential for additional impacts resulting from this proposed measure, overall benefits to the larger traffic network, and cost of construction.

***Sharrotts Road/Arthur Kill Road*:**

- In 2020, marginally-unmitigable potential significant traffic impacts are projected to remain on the stop-controlled eastbound and westbound approaches during the Saturday midday peak hour.

4.5 GREENHOUSE GAS EMISSIONS

The developer of the retail buildings within Retail Site "A" have committed to the following actions to be consistent with City's policy regarding GHG reduction, Local Law 22 of 2008:

(i) Design and construct to achieve a 10% reduction in energy performance, calculated in accordance with LEED Core and Shell, Energy and Atmosphere, Prerequisite 2, Option 1, or

design and construct in accordance with the Prescriptive Compliance Path set forth in LEED Core and Shell, Energy and Atmosphere Credit 1, Option 3; and

(ii) Employ low flow fixtures, fittings and appliances, which are described in LEED Core and Shell, Water Efficiency, Prerequisite 1.

The elements of how the developer would meet these commitments and how compliance would be reported will be further developed and reported in the FEIS. This commitment would be required by provision of the contract sale between NYCEDC and the developer.

Table 4-2

Peak Hour Level-of-Service Analysis Results, Year 2015 Comparison of Future No-Action and Mitigated With-Action Traffic Conditions

Intersection	Approach	Movement	Weekday AM Peak Hour (8:00 to 9:00 AM)								Weekday Midday Peak Hour (12:00 to 1:00 PM)								Weekday PM Peak Hour (5:00 to 6:00 PM)								Saturday Midday Peak Hour (12:45 to 1:45 PM)							
			2015 No-Action			2015 Mitigated-Action			Change in Delay	Impact?	2015 No-Action			2015 Mitigated-Action			Change in Delay	Impact?	2015 No-Action			2015 Mitigated-Action			Change in Delay	Impact?	2015 No-Action			2015 Mitigated-Action			Change in Delay	Impact?
			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS		
SIGNALIZED INTERSECTIONS																																
Allentown Lane-Veterans Rd West / Arthur Kill Road	EB	LTR	0.02	10.3	B	0.02	10.3	B	0.0		0.04	10.5	B	0.04	10.5	B	0.0		0.02	10.3	B	0.02	11.6	B	1.3		0.02	10.3	B	0.02	11.6	B	1.3	
	WB	LT	0.39	14.1	B	0.40	14.3	B	0.2		0.49	15.6	B	0.53	16.6	B	1.0		0.58	17.8	B	0.69	22.9	C	5.1		0.60	17.6	B	0.72	23.1	C	5.5	
		R	0.57	17.7	B	0.59	18.1	B	0.4		0.77	24.4	C	0.83	28.2	C	3.8		0.54	17.0	B	0.66	21.8	C	4.8		0.69	20.4	C	0.83	29.5	C	9.1	
	NB	LTR	0.68	18.9	B	0.70	19.5	B	0.6		0.56	16.4	B	0.61	17.2	B	0.8		0.60	17.0	B	0.59	15.3	B	-1.7		0.73	20.1	C	0.73	18.5	B	-1.6	
	SB	LTR	0.45	15.5	B	0.54	17.8	B	2.3		0.65	20.0	C	0.80	28.0	C	8.0		0.96	48.5	D	0.98	50.8	D	2.3		0.82	30.2	C	0.91	40.1	D	9.9	
	Overall		**0.63**	**17.1**	**B**	**0.64**	**17.9**	**B**	**0.8**		**0.71**	**19.2**	**B**	**0.81**	**22.7**	**C**	**3.5**		**0.77**	**26.9**	**C**	**0.85**	**29.0**	**C**	**2.1**		**0.75**	**21.9**	**C**	**0.87**	**27.0**	**C**	**5.1**	
North Bridge Street / Arthur Kill Road	WB	LR	0.47	18.1	B	0.47	18.1	B	0.0		0.62	20.6	C	0.62	20.6	C	0.0		0.91	28.0	C	0.91	28.0	C	0.0		0.86	25.8	C	0.86	25.8	C	0.0	
	NB	T	0.49	11.5	B	0.50	11.6	B	0.1		0.41	10.5	B	0.44	10.8	B	0.3		0.43	10.8	B	0.46	11.1	B	0.3		0.52	11.8	B	0.56	12.4	B	0.6	
	SB	T	0.33	9.7	A	0.34	9.7	A	0.0		0.48	10.8	B	0.50	11.1	B	0.3		0.58	11.4	B	0.60	11.7	B	0.3		0.52	10.8	B	0.55	11.2	B	0.4	
	Overall		**0.48**	**12.8**	**B**	**0.49**	**12.9**	**B**	**0.1**		**0.53**	**13.8**	**B**	**0.55**	**13.9**	**B**	**0.1**		**0.71**	**17.5**	**B**	**0.73**	**17.5**	**B**	**0.0**		**0.66**	**16.4**	**B**	**0.68**	**16.5**	**B**	**0.1**	
Richmond Valley Road / Arthur Kill Road	WB	LR	0.53	23.9	C	0.53	23.9	C	0.0		0.82	37.2	D	0.82	37.2	D	0.0		0.81	35.7	D	0.81	35.7	D	0.0		0.83	37.6	D	0.83	37.6	D	0.0	
	NB	TR	0.63	11.1	B	0.65	11.3	B	0.2		0.50	9.4	A	0.53	9.7	A	0.3		0.60	10.5	B	0.63	10.9	B	0.4		0.62	10.7	B	0.65	11.3	B	0.6	
	SB	LT	0.59	11.2	B	-	-	-	-		1.01	39.0	D	-	-	-	-		1.17	90.0	F	-	-	-	-		1.12	73.2	E	-	-	-	-	
		L	-	-	-	0.34	9.7	A	-		-	-	-	0.56	11.4	B	-		-	-	-	0.47	8.3	A	-		-	-	-	0.51	9.7	A	-	
		T	-	-	-	0.40	8.4	A	-		-	-	-	0.54	9.2	A	-		-	-	-	0.86	12.2	B	-		-	-	-	0.76	11.5	B	-	
	Overall		0.60	13.1	B	**0.61**	**12.3**	**B**	**-0.8**		**0.95**	**28.3**	**C**	**0.64**	**15.3**	**B**	**-13.0**		**1.05**	**53.1**	**D**	**0.84**	**15.4**	**B**	**-37.7**		**1.03**	**43.8**	**D**	**0.78**	**15.7**	**B**	**-28.1**	
Richmond Valley Road / Page Avenue	EB	LTR	0.31	22.8	C	0.31	22.8	C	0.0		0.73	32.8	C	0.73	32.8	C	0.0		0.59	27.0	C	0.59	27.0	C	0.0		0.58	26.8	C	0.58	26.8	C	0.0	
	WB	LTR	0.30	22.9	C	0.30	22.9	C	0.0		0.49	26.4	C	0.49	26.4	C	0.0		0.57	28.2	C	0.57	28.2	C	0.0		0.38	24.3	C	0.38	24.3	C	0.0	
	NB	L	0.14	10.5	B	0.14	10.5	B	0.0		0.26	12.3	B	0.27	12.5	B	0.2		0.21	11.7	B	0.21	11.9	B	0.2		0.46	15.1	B	0.48	15.6	B	0.5	
		TR	0.77	19.8	B	0.78	20.2	C	0.4		0.71	18.3	B	0.74	19.1	B	0.8		0.66	17.1	B	0.69	17.7	B	0.6		0.86	23.0	C	0.90	25.5	C	2.5	
	SB	LTR	0.48	14.1	B	0.49	14.3	B	0.2		0.67	18.4	B	0.71	19.7	B	1.3		0.74	20.4	C	0.78	22.2	C	1.8		0.56	15.2	B	0.62	16.3	B	1.1	
	Overall		**0.59**	**18.5**	**B**	**0.60**	**18.7**	**B**	**0.2**		**0.72**	**21.3**	**C**	**0.74**	**22.0**	**C**	**0.7**		**0.68**	**21.1**	**C**	**0.71**	**21.9**	**C**	**0.8**		**0.75**	**20.7**	**C**	**0.78**	**22.0**	**C**	**1.3**	
South Bridge Street / Page Avenue-Boscombe Avenue	EB	L	0.46	25.8	C	0.46	25.8	C	0.0		0.49	26.4	C	0.49	26.4	C	0.0		0.60	28.9	C	0.60	28.9	C	0.0		0.66	30.8	C	0.66	30.8	C	0.0	
		R	0.12	10.9	B	0.12	10.9	B	0.0		0.15	11.1	B	0.15	11.2	B	0.1		0.15	12.1	B	0.15	12.3	B	0.2		0.09	10.7	B	0.09	10.8	B	0.1	
	NB	T	0.37	11.5	B	0.38	11.6	B	0.1		0.38	11.6	B	0.39	11.8	B	0.2		0.35	11.4	B	0.36	11.5	B	0.1		0.41	11.9	B	0.43	12.0	B	0.1	
	SB	T	0.23	10.4	B	0.23	10.5	B	0.1		0.29	11.0	B	0.31	11.1	B	0.1		0.35	11.5	B	0.36	11.6	B	0.1		0.35	11.5	B	0.37	11.7	B	0.2	
	Overall		*	**13.9**	**B**	*	**14.0**	**B**	**0.0**		*	**14.0**	**B**	*	**14.0**	**B**	**0.1**		*	**15.2**	**B**	*	**15.2**	**B**	**0.0**		*	**15.5**	**B**	*	**15.5**	**B**	**0.0**	
Veterans Road West / Bricktown Way-KWVP WB off-ramp	EB	L	0.21	22.9	C	0.31	24.7	C	1.8		0.52	31.8	C	0.76	43.8	D	12.0		0.44	27.1	C	0.67	34.5	C	7.4		0.53	31.3	C	0.95	72.6	E	41.3	yes
		TR	0.50	26.5	C	0.50	26.5	C	0.0		0.50	26.6	C	0.47	24.6	C	-2.0		0.61	28.4	C	0.61	28.4	C	0.0		0.63	28.8	C	0.63	28.8	C	0.0	
	WB	L	0.90	64.1	E	0.90	64.1	E	0.0		0.83	52.1	D	0.75	41.4	D	-10.7		1.11	118.2	F	1.11	118.2	F	0.0		1.24	167.2	F	1.24	167.2	F	0.0	
		TR	0.40	24.1	C	0.40	24.1	C	0.0		0.50	25.4	C	0.47	23.6	C	-1.8		0.37	23.1	C	0.37	23.1	C	0.0		0.50	24.7	C	0.50	24.7	C	0.0	
	NB	LTR	0.41	27.9	C	0.51	29.5	C	1.6		0.62	31.5	C	0.85	40.8	D	9.3		0.52	29.5	C	0.74	34.8	C	5.3		0.70	33.6	C	1.04	71.2	E	37.6	yes
		U-TURN	0.50	16.7	C	0.50	16.9	C	0.2		0.33	14.1	B	0.34	14.5	B	0.4		0.97	61.0	F	1.00	68.5	F	7.5		0.55	21.7	C	0.56	23.0	C	1.3	
	SB	L	0.02	27.4	C	0.02	27.4	C	0.0		0.16	29.1	C	0.20	30.9	C	1.8		0.15	29.0	C	0.16	29.1	C	0.1		0.13	28.7	C	0.14	28.8	C	0.1	
		TR	0.20	29.7	C	0.28	31.1	C	1.4		0.28	30.9	C	0.20	39.9	D	9.0		0.26	30.5	C	0.52	35.8	D	5.3		0.61	37.8	D	0.92	62.9	E	25.1	yes
	Overall		*	**29.1**	**C**	*	**29.5**	**C**	**0.5**		*	**29.4**	**C**	*	**32.6**	**C**	**3.2**		*	**33.1**	**C**	*	**46.5**	**D**	**13.4**		*	**45.4**	**D**	*	**60.9**	**E**	**15.5**	
Veterans Road West / Tyrellan Avenue	EB	LTR	0.27	16.4	B	0.28	16.4	B	0.0		0.47	18.8	B	0.53	22.2	C	3.4		0.42	18.0	B	0.43	18.8	B	0.8		0.50	19.3	B	0.70	30.3	C	11.0	
	WB	LTR	0.37	17.5	B	0.37	17.5	B	0.0		0.47	19.1	B	0.53	22.7	C	3.6		0.48	19.2	B	0.50	20.0	B	0.8		0.67	22.7	C	0.89	40.4	D	17.7	
	NB	DefL	0.52	21.9	C	0.57	23.8	C	1.9		0.84	45.9	D	0.75	44.3	D	-1.6		0.56	24.4	C	0.79	41.0	D	16.6		0.94	65.8	E	0.70	42.4	D	-23.4	
		TR	0.18	15.6	B	0.20	15.9	B	0.3		0.34	17.5	B	0.36	15.5	B	-2.0		0.30	17.0	B	0.34	16.9	B	-0.1		0.42	18.7	B	0.41	13.2	B	-5.5	
	SB	LTR	0.22	15.9	B	0.29	16.5	B	0.6		0.52	19.8	B	0.84	33.9	C	14.1		0.36	17.4	B	0.52	18.9	B	1.5		0.57	20.4	C	0.82	28.3	C	7.9	
	Overall		**0.44**	**17.5**	**B**	**0.47**	**17.9**	**B**	**0.4**		**0.66**	**22.2**	**C**	**0.92**	**27.8**	**C**	**5.6**		**0.52**	**18.7**	**B**	**0.65**	**21.1**	**C**	**2.4**		**0.80**	**24.9**	**C**	**1.15**	**30.6**	**C**	**5.7**	
Boscombe Avenue / Outerbridge Crossing ramps	EB	L	0.98	35.4	D	0.98	37.3	D	1.9		0.92	34.3	C	0.97	42.6	D	8.3		0.96	32.5	C	1.00	43.2	D	10.7		0.98	37.6	D	0.98	37.8	D	0.2	
		TR	0.22	4.7	A	0.23	4.8	A	0.1		0.34	5.5	A	0.45	12.0	B	6.5		0.29	4.5	A	0.32	5.0	A	0.5		0.33	5.3	A	0.36	5.1	A	-0.2	
	WB	LT	0.67	38.1	D	0.69	38.9	D	0.8		0.93	52.1	D	0.78	33.8	C	-18.3		0.59	29.0	C	0.66	31.3	C	2.3		0.97	45.8	D	1.00	50.2	D	4.4	
		R	0.54	34.5	C	0.70	40.8	D	6.3		0.83	43.4	D	1.09	88.7	F	45.3	yes	0.79	36.3	D	1.25	154.2	F	117.9	yes	1.06	70.9	E	0.90	25.0	C	-45.9	
	NB	LTR	0.20	32.8	C	0.20	32.8	C	0.0		0.01	30.6	C	0.01	32.2	C	1.6		0.11	34.2	C	0.10	33.0	C	-1.2		-	-	-	-	-	-	-	
	SB	L	0.48	40.3	D	0.52	41.9	D	1.6		0.34	36.4	D	0.50	43.3	D	6.9		0.61	48.2	D	0.67	50.7	D	2.5		0.31	33.6	C	0.39	35.5	D	1.9	
		LT	0.02	30.6	C	0.02	30.6	C	0.0		0.00	30.4	C	0.00	32.1	C	1.7		0.00	32.1	C	0.00	31.3	C	-0.8		-	-	-	-	-	-	-	
		R	0.17	6.8	A	0.17	6.8	A	0.0		0.14	6.6	A	0.15	8.3	A	1.7		0.40	11.8	B	0.39	11.2	B	-0.6		0.23	7.3	A	0.24	7.7	A	0.4	
	Overall		**0.85**	**29.5**	**C**	**0.87**	**31.4**	**C**	**1.9**		**0.84**	**32.1**	**C**	**0.94**	**43.9**	**D**	**11.8**		**0.86**	**23.6**	**C**	**1.02**	**57.3**	**E**	**33.7**		**0.87**	**36.6**	**D**	**0.95**	**29.5**	**C**	**-7.1**	

Table 4-2 (cont'd)

Peak Hour Level-of-Service Analysis Results, Year 2015 Comparison of Future No-Action and Mitigated With-Action Traffic Conditions

Intersection	Approach	Movement	Weekday AM Peak Hour (8:00 to 9:00 AM)								Weekday Midday Peak Hour (12:00 to 1:00 PM)							
			2015 No-Action			2015 Mitigated-Action			Change in Delay	Impact?	2015 No-Action			2015 Mitigated-Action			Change in Delay	Impact?
			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS		
SIGNALIZED INTERSECTIONS																		
Boscombe Avenue / Tyrellan Avenue	EB	DefL	0.46	16.6	B	0.49	17.2	B	0.6		0.62	20.1	C	0.81	34.1	C	14.0	
		TR	0.03	11.4	B	0.03	11.4	B	0.0		0.04	11.5	B	0.04	15.4	B	3.9	
	WB	LTR	0.10	11.9	B	0.10	11.9	B	0.0		0.08	11.8	B	0.10	15.8	B	4.0	
	NB	LTR	0.07	17.4	B	0.07	17.4	B	0.0		-	-	-	-	-	-	-	
		DefL	-	-	-	-	-	-	-		0.01	16.9	B	0.01	12.9	B	-	
		TR	-	-	-	-	-	-	-		0.01	16.9	B	0.01	12.8	B	-	
	SB	LT	0.10	17.8	B	0.10	17.8	B	0.0		0.14	18.3	B	0.12	13.9	B	-4.4	
		R	0.39	21.6	C	0.52	24.1	C	2.5		0.71	29.7	C	0.93	42.0	D	12.3	
	Overall		**0.43**	**17.2**	**B**	**0.50**	**18.5**	**B**	**1.3**		**0.66**	**22.3**	**C**	**0.88**	**34.4**	**C**	**12.1**	
Bricktown Way / Veterans Road West	EB	L	0.14	15.3	B	0.21	15.9	B	0.6		0.30	16.9	B	0.49	19.7	B	2.8	
		R	0.00	14.0	B	0.00	14.0	B	0.0		0.04	14.4	B	0.04	14.4	B	0.0	
	NB	LT	0.07	7.3	A	0.07	7.3	A	0.0		0.14	7.7	A	0.14	7.7	A	0.0	
	SB	TR	0.34	8.9	A	0.37	9.1	A	0.2		0.48	9.9	A	0.55	10.6	B	0.7	
	Overall		**0.27**	**9.2**	**A**	**0.31**	**9.7**	**A**	**0.5**		**0.41**	**10.4**	**B**	**0.53**	**11.8**	**B**	**1.4**	
Englewood Avenue / Veterans Road West	EB	TR	0.01	10.2	B	0.01	10.2	B	0.0		0.01	10.2	B	0.01	10.2	B	0.0	
	WB	L	0.43	14.6	B	0.44	14.9	B	0.3		0.47	15.2	B	0.50	15.7	B	0.5	
		LT	0.45	15.0	B	0.46	15.3	B	0.3		0.49	15.7	B	0.52	16.2	B	0.5	
	NB	L	0.01	10.3	B	0.01	10.3	B	0.0		0.00	10.2	B	0.00	10.2	B	0.0	
		R	0.17	9.2	A	0.21	9.3	A	0.1		0.37	10.5	B	0.47	11.5	B	1.0	
	SB	LTR	0.10	10.8	B	0.12	10.9	B	0.1		0.13	10.9	B	0.17	11.2	B	0.3	
	Overall		*	**12.6**	**B**	*	**12.7**	**B**	**0.1**		*	**12.9**	**B**	*	**13.3**	**B**	**0.4**	
Englewood Avenue / Veterans Road East	EB	LT	0.29	15.5	B	0.33	15.9	B	0.4		0.52	19.0	B	0.62	21.2	C	2.2	
		R	0.05	13.1	B	0.07	13.3	B	0.2		0.11	13.6	B	0.17	14.1	B	0.5	
	WB	LTR	0.11	13.6	B	0.11	13.6	B	0.0		0.09	13.4	B	0.09	13.4	B	0.0	
	NB	LTR	0.26	9.4	A	0.27	9.5	A	0.1		0.25	9.3	A	0.26	9.4	A	0.1	
	Overall		**0.27**	**11.0**	**B**	**0.29**	**11.2**	**B**	**0.2**		**0.36**	**12.7**	**B**	**0.41**	**13.8**	**B**	**1.1**	
Englewood Avenue / Bloomingdale Road	EB	LR	0.14	17.4	B	0.19	17.9	B	0.5		0.31	19.3	B	0.47	21.7	C	2.4	
	NB	LT	0.39	8.3	A	0.39	8.3	A	0.0		0.31	7.6	A	0.31	7.6	A	0.0	
	SB	TR	0.52	9.4	A	0.52	9.4	A	0.0		0.34	7.7	A	0.34	7.7	A	0.0	
	Overall		**0.40**	**9.5**	**A**	**0.41**	**9.7**	**A**	**0.2**		**0.33**	**9.5**	**A**	**0.38**	**10.9**	**B**	**1.4**	
Sharrotts Road / Bloomingdale Road	EB	LR	0.26	15.8	B	0.26	15.8	B	0.0		0.27	15.9	B	0.27	15.9	B	0.0	
	NB	LT	0.52	12.2	B	0.55	12.6	B	0.4		0.49	11.8	B	0.57	13.1	B	1.3	
	SB	TR	0.44	11.0	B	0.48	11.5	B	0.5		0.40	10.5	B	0.48	11.5	B	1.0	
	Overall		**0.42**	**12.2**	**B**	**0.43**	**12.5**	**B**	**0.3**		**0.40**	**11.9**	**B**	**0.45**	**12.7**	**B**	**0.8**	
Veterans Road East-Drumgoole Road West / Bloomingdale Road	EB	L	0.02	22.7	C	0.02	22.7	C	0.0		0.05	23.1	C	0.05	23.1	C	0.0	
		R	0.33	27.5	C	0.38	28.6	C	1.1		0.60	34.2	C	0.78	44.9	D	10.7	
	WB	LTR	0.67	21.0	C	0.67	21.0	C	0.0		0.69	21.2	C	0.69	21.2	C	0.0	
	NB	L	0.38	23.8	C	0.52	30.3	C	6.5		0.40	21.9	C	0.63	32.0	C	10.1	
		T	0.36	16.8	B	0.36	16.8	B	0.0		0.31	16.1	B	0.31	16.1	B	0.0	
	SB	TR	0.95	30.5	C	0.95	30.5	C	0.0		0.60	19.8	B	0.60	19.8	B	0.0	
	Overall		**0.74**	**24.1**	**C**	**0.74**	**24.4**	**C**	**0.3**		**0.63**	**21.4**	**C**	**0.67**	**23.3**	**C**	**1.9**	
South Service Road-Drumgoole Road East / Bloomingdale Road	EB	LTR	0.15	16.8	B	0.15	16.8	B	0.0		0.09	16.2	B	0.09	16.2	B	0.0	
	NB	LTR	0.38	8.8	A	0.40	9.0	A	0.2		0.41	9.1	A	0.45	9.5	A	0.4	
	SB	L	0.57	11.0	B	0.58	11.3	B	0.3		0.44	10.0	A	0.46	10.4	B	0.4	
		TR	0.65	11.2	B	0.66	11.4	B	0.2		0.48	9.6	A	0.51	9.9	A	0.3	
	Overall		**0.48**	**10.8**	**B**	**0.49**	**11.0**	**B**	**0.2**		**0.35**	**9.7**	**A**	**0.37**	**10.1**	**B**	**0.4**	
Pleasant Plains Avenue-Amboy Road / Bloomingdale Road	EB	LTR	0.09	14.7	B	0.09	15.3	B	0.6		0.06	14.4	B	0.06	14.4	B	0.0	
	WB	L	0.34	18.1	B	0.35	18.8	B	0.7		0.56	21.9	C	0.56	21.9	C	0.0	
		T	0.02	14.1	B	0.02	14.7	B	0.6		0.04	14.2	B	0.04	14.2	B	0.0	
		R	0.20	16.0	B	0.21	16.7	B	0.7		0.21	16.1	B	0.21	16.1	B	0.0	
	NB	LTR	0.48	19.7	B	0.49	19.2	B	-0.5		0.68	23.3	C	0.73	24.9	C	1.6	
	SB	LTR	1.01	37.7	D	1.01	37.0	D	-0.7		0.73	25.3	C	0.79	27.9	C	2.6	
	Overall		**0.67**	**26.8**	**C**	**0.69**	**26.6**	**C**	**-0.2**		**0.64**	**22.6**	**C**	**0.67**	**24.1**	**C**	**1.5**	
Arthur Kill Road / Bloomingdale Road	EB	TR	0.32	14.3	B	0.33	14.4	B	0.1		0.34	14.5	B	0.37	14.9	B	0.4	
	WB	LT	0.26	13.6	B	0.34	14.7	B	1.1		0.30	14.2	B	0.57	19.5	B	5.3	
	NB	LR	0.53	24.4	C	0.57	25.4	C	1.0		0.48	23.3	C	0.61	26.5	C	3.2	
	Overall		**0.41**	**17.8**	**B**	**0.44**	**18.4**	**B**	**0.6**		**0.40**	**17.4**	**B**	**0.59**	**20.3**	**C**	**2.9**	

Intersection	Approach	Movement	Weekday PM Peak Hour (5:00 to 6:00 PM)								Saturday Midday Peak Hour (12:45 to 1:45 PM)							
			2015 No-Action			2015 Mitigated-Action			Change in Delay	Impact?	2015 No-Action			2015 Mitigated-Action			Change in Delay	Impact?
			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS		
SIGNALIZED INTERSECTIONS																		
Boscombe Avenue / Tyrellan Avenue	EB	DefL	0.56	18.5	B	0.69	24.7	C	6.2		0.70	22.7	C	0.71	23.6	C	0.9	
		TR	0.04	11.5	B	0.04	13.7	B	2.2		0.04	11.6	B	0.04	11.6	B	0.0	
	WB	LTR	0.05	11.6	B	0.05	13.7	B	2.1		0.06	11.7	B	0.08	20.1	C	8.4	
	NB	LTR	0.01	16.9	B	0.01	14.5	B	-2.4		0.00	16.8	B	0.00	16.8	B	0.0	
		DefL	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
		TR	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
	SB	LT	0.12	18.0	B	0.11	15.5	B	-2.5		0.16	18.4	B	0.16	18.4	B	0.0	
		R	0.63	26.9	C	0.91	41.6	D	14.7		0.86	37.9	D	0.98	43.9	D	6.0	
	Overall		**0.59**	**20.9**	**C**	**0.80**	**31.4**	**C**	**10.5**		**0.77**	**27.5**	**C**	**0.99**	**33.2**	**C**	**5.7**	
Bricktown Way / Veterans Road West	EB	L	0.30	16.8	B	0.49	19.7	B	2.9		0.51	19.6	B	0.77	27.1	C	7.5	
		R	0.04	14.4	B	0.04	14.4	B	0.0		0.06	14.5	B	0.06	14.5	B	0.0	
	NB	LT	0.17	7.9	A	0.17	7.9	A	0.0		0.17	7.9	A	0.18	7.9	A	0.0	
	SB	TR	0.37	9.1	A	0.43	9.6	A	0.5		0.56	10.4	B	0.65	11.4	B	1.0	
	Overall		**0.34**	**10.0**	**A**	**0.46**	**11.2**	**B**	**1.2**		**0.54**	**11.6**	**B**	**0.69**	**14.3**	**B**	**2.7**	
Englewood Avenue / Veterans Road West	EB	TR	0.01	10.2	B	0.01	10.2	B	0.0		0.01	10.2	B	0.00	9.7	A	-0.5	
	WB	L	0.42	14.4	B	0.45	14.9	B	0.5		0.93	39.4	D	0.96	42.7	D	3.3	
		LT	0.44	14.9	B	0.47	15.4	B	0.5		0.33	13.3	B	0.33	12.7	B	-0.6	
	NB	L	0.01	10.3	B	0.01	10.3	B	0.0		0.02	10.3	B	0.02	11.0	B	0.7	
		R	0.42	11.0	B	0.52	12.2	B	1.2		0.55	12.6	B	0.68	15.6	C	3.0	
	SB	LTR	0.13	10.9	B	0.16	11.1	B	0.2		0.17	11.2	B	0.23	12.2	B	1.0	
	Overall		*	**12.4**	**B**	*	**12.9**	**B**	**0.6**		*	**24.5**	**C**	*	**26.0**	**C**	**1.5**	
Englewood Avenue / Veterans Road East	EB	LT	0.68	23.5	C	0.79	28.3	C	4.8		0.98	53.0	D	1.00	52.9	D	-0.1	
		R	0.12	13.7	B	0.19	14.3	B	0.6		0.17	14.1	B	0.23	12.8	B	-1.3	
	WB	LTR	0.13	13.8	B	0.13	13.8	B	0.0		0.16	14.1	B	0.14	11.9	B	-2.2	
	NB	LTR	0.25	9.3	A	0.26	9.4	A	0.1		0.33	9.9	A	0.39	12.1	B	2.2	
	Overall		**0.43**	**14.6**	**B**	**0.48**	**16.8**	**B**	**2.2**		**0.60**	**25.9**	**C**	**0.68**	**27.6**	**C**	**1.7**	
Englewood Avenue / Bloomingdale Road	EB	LR	0.27	18.8	B	0.41	20.7	C	1.9		0.43	20.9	C	0.62	25.0	C	4.1	
	NB	LT	0.50	9.2	A	0.50	9.2	A	0.0		0.40	8.3	A	0.40	8.3	A	0.0	
	SB	TR	0.48	9.0	A	0.48	9.0	A	0.0		0.39	8.2	A	0.39	8.2	A	0.0	
	Overall		**0.42**	**10.1**	**B**	**0.47**	**10.8**	**B**	**0.7**		**0.41**	**10.5**	**B**	**0.47**	**12.3**	**B**	**1.8**	
Sharrotts Road / Bloomingdale Road	EB	LR	0.49	18.7	B	0.49	18.7	B	0.0		0.47	18.4	B	0.47	18.4	B	0.0	
	NB	LT	0.59	13.0	B	0.67	14.6	B	1.6		0.58	12.9	B	0.68	15.2	B	2.3	
	SB	TR	0.55	12.4	B	0.63	13.8	B	1.4		0.54	12.1	B	0.65	14.0	B	1.9	
	Overall		**0.55**	**13.9**	**B**	**0.60**	**15.0**	**B**	**1.1**		**0.53**	**13.7**	**B**	**0.60**	**15.2**	**B**	**1.5**	
Veterans Road East-Drumgoole Road West / Bloomingdale Road	EB	L	0.02	22.7	C	0.02	22.7	C	0.0		0.12	23.7	C	0.19	27.8	C	4.1	
		R	0.55	32.3	C	0.70	39.2	D	6.9		0.76	41.5	D	0.58	25.0	C	-16.5	
	WB	LTR	0.84	23.6	C	0.89	26.5	C	2.9		0.90	26.0	C	0.96	31.9	C	5.9	
	NB	L	0.44	26.0	C	0.71	44.3	D	18.3		0.58	30.9	C	0.35	22.0	C	-8.9	
		T	0.35	16.5	B	0.33	15.6	B	-0.9		0.38	16.9	B	0.32	13.4	B	-3.5	
	SB	TR	0.83	28.6	C	0.79	25.3	C	-3.3		0.66	20.7	C	0.88	36.6	D	15.9	
	Overall		**0.78**	**24.8**	**C**	**0.81**	**26.8**	**C**	**2.0**		**0.77**	**25.2**	**C**	**0.85**	**29.6**	**C**	**4.4**	
South Service Road-Drumgoole Road East / Bloomingdale Road	EB	LTR	0.12	16.5	B	0.12	16.5	B	0.0		0.19	17.2	B	0.19	17.2	B	0.0	
	NB	LTR	0.42	9.1	A	0.45	9.5	A	0.4		0.46	9.6	A	0.51	10.2	B	0.6	
	SB	L	0.62	12.1	B	0.64	12.9	B	0.8		0.67	14.0	B	0.71	15.8	B	1.8	
		TR	0.59	10.5	B	0.62	10.9	B	0.4		0.53	9.9	A	0.58	10.4	B	0.5	
	Overall		**0.45**	**10.7**	**B**	**0.47**	**11.2**	**B**	**0.5**		**0.51**	**11.2**	**B**	**0.54**	**12.0**	**B**	**0.8**	
Pleasant Plains Avenue-Amboy Road / Bloomingdale Road	EB	LTR	0.09	14.7	B	0.09	14.7	B	0.0		0.06	14.4	B	0.06	14.4	B	0.0	
	WB	L	0.53	21.4	C	0.53	21.4	C	0.0		0.54	21.6	C	0.54	21.6	C	0.0	
		T	0.04	14.2	B	0.04	14.2	B	0.0		0.02	14.1	B	0.02	14.1	B	0.0	
		R	0.21	16.0	B	0.21	16.0	B	0.0		0.19	15.8	B	0.19	15.8	B	0.0	
	NB	LTR	0.66	22.8	C	0.70	24.0	C	1.2		0.75	24.5	C	0.81	26.9	C	2.4	
	SB	LTR	0.87	26.5	C	0.93	30.9	C	4.4		0.80	26.8	C	0.88	31.9	C	5.1	
	Overall		**0.70**	**22.8**	**C**	**0.73**	**25.0**	**C**	**2.2**		**0.67**	**23.6**	**C**	**0.71**	**26.3**	**C**	**2.7**	
Arthur Kill Road / Bloomingdale Road	EB	TR	0.42	15.6	B	0.46	16.1	B	0.5		0.43	15.6	B	0.47	16.2	B	0.6	
	WB	LT	0.29	14.0	B	0.59	20.3	C	6.3		0.31	14.4	B	0.77	28.9	C	14.5	
	NB	LR	0.50	23.8	C	0.68	28.7	C	4.9		0.41	22.1	C	0.59	26.2	C	4.1	
	Overall		**0.46**	**17.7**	**B**	**0.63**	**21.5**	**C**	**3.8**		**0.42**	**17.0**	**B**	**0.69**	**23.2**	**C**	**6.2**	

Table 4-2 (cont'd)

Peak Hour Level-of-Service Analysis Results, Year 2015 Comparison of Future No-Action and Mitigated With-Action Traffic Conditions

Intersection	Approach	Movement	Weekday AM Peak Hour (8:00 to 9:00 AM)								Weekday Midday Peak Hour (12:00 to 1:00 PM)								Weekday PM Peak Hour (5:00 to 6:00 PM)								Saturday Midday Peak Hour (12:45 to 1:45 PM)							
			2015 No-Action			2015 Mitigated-Action			Change in Delay	Impact?	2015 No-Action			2015 Mitigated-Action			Change in Delay	Impact?	2015 No-Action			2015 Mitigated-Action			Change in Delay	Impact?	2015 No-Action			2015 Mitigated-Action			Change in Delay	Impact?
			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS		
UNSIGNALIZED INTERSECTIONS																																
Sharrots Road / Arthur Kill Road	EB	LTR	0.06	13.3	B	0.06	13.6	B	0.3		0.21	14.6	B	0.22	15.7	C	1.1		0.25	18.2	C	0.27	20.1	C	1.9		0.46	20.1	C	0.51	23.6	C	3.5	
	WB	LTR	0.20	13.9	B	0.20	14.3	B	0.4		0.22	16.7	C	0.24	18.2	C	1.5		0.36	20.8	C	0.40	23.6	C	2.8		0.38	19.8	C	0.43	23.4	C	3.6	
	NB	LTR	0.02	7.9	A	0.02	8.0	A	0.1		0.03	7.9	A	0.03	8.0	A	0.1		0.03	7.9	A	0.03	8.0	A	0.1		0.01	7.8	A	0.01	8.0	A	0.2	
	SB	LTR	0.03	7.9	A	0.03	7.9	A	0.0		0.03	8.1	A	0.03	8.2	A	0.1		0.06	8.1	A	0.06	8.2	A	0.1		0.02	7.9	A	0.03	8.0	A	0.1	
Englewood Avenue / Arthur Kill Road	WB	LR	0.05	10.5	B	0.05	10.6	B	0.1		0.12	13.4	B	0.13	14.1	B	0.7		0.16	13.4	B	0.17	14.2	B	0.8		0.06	11.2	B	0.06	11.8	B	0.6	
	SB	LT	0.02	7.9	A	0.02	8.0	A	0.1		0.02	8.1	A	0.02	8.2	A	0.1		0.01	8.0	A	0.01	8.1	A	0.1		0.01	7.9	A	0.01	8.0	A	0.1	
South Bridge Street / Arthur Kill Road	SB	LT	0.17	10.4	B	0.17	10.5	B	0.1		0.18	10.0	B	0.19	10.2	B	0.2		0.26	11.0	B	0.26	11.1	B	0.1		0.24	11.0	B	0.25	11.3	B	0.3	
Bricktown Way / Tyrellan Avenue	EB	LT	0.04	7.9	A	0.12	9.2	A	1.3		0.07	8.8	A	0.35	14.3	B	5.5		0.08	8.3	A	0.33	12.9	B	4.7		0.16	9.0	A	0.60	21.7	C	12.8	
		TR	0.07	7.7	A	0.09	8.2	A	0.5		0.12	8.8	A	0.23	11.7	B	2.8		0.12	8.2	A	0.22	10.7	B	2.5		0.21	9.1	A	0.39	14.8	B	5.6	
	WB	LT	0.09	8.2	A	0.11	8.7	A	0.5		0.28	10.0	B	0.38	13.8	B	3.8		0.33	10.5	B	0.43	14.5	B	4.0		0.32	10.7	B	0.48	17.9	C	7.2	
		TR	0.03	7.5	A	0.10	7.8	A	0.3		0.07	8.0	A	0.27	11.0	B	3.0		0.10	8.1	A	0.28	11.0	B	2.9		0.14	8.7	A	0.49	16.9	C	8.1	
	NB	LT	0.01	7.7	A	0.05	8.6	A	1.0		0.07	8.4	A	0.22	12.0	B	3.5		0.02	8.3	A	0.14	11.0	B	2.7		0.09	9.0	A	0.31	14.9	B	5.9	
		R	0.03	6.9	A	0.03	7.5	A	0.6		0.06	7.5	A	0.09	9.6	A	2.1		0.11	7.9	A	0.12	9.8	A	2.0		0.13	8.3	A	0.21	12.2	B	3.9	
	SB	LT	-	-	-	0.08	8.7	A	-		-	-	-	0.35	13.3	B	-		-	-	-	0.34	13.0	B	-		-	-	-	0.58	21.0	C	-	
		TR	-	-	-	0.06	8.1	A	-		-	-	-	0.29	11.7	B	-		-	-	-	0.28	11.5	B	-		-	-	-	0.49	16.9	C	-	
Sharrots Road / Veterans Road West	EB	TR	0.12	8.3	A	0.12	8.4	A	0.1		0.12	8.2	A	0.12	8.4	A	0.2		0.21	8.6	A	0.22	8.8	A	0.2		0.18	8.5	A	0.19	8.7	A	0.2	
	WB	LT	0.24	8.9	A	0.29	9.4	A	0.4		0.27	9.3	A	0.39	10.5	B	1.2		0.32	9.8	A	0.43	11.2	B	1.4		0.34	10.1	B	0.49	12.2	B	2.1	
	SB	LT	0.07	8.0	A	0.07	8.1	A	0.1		0.11	8.3	A	0.12	8.6	A	0.3		0.10	8.5	A	0.10	8.8	A	0.3		0.11	8.5	A	0.12	8.9	A	0.4	
		TR	0.09	7.8	A	0.09	7.9	A	0.1		0.09	7.9	A	0.09	8.1	A	0.3		0.10	8.2	A	0.10	8.4	A	0.3		0.12	8.3	A	0.12	8.7	A	0.4	
Sharrots Road / Veterans Road East	EB	LT	0.11	8.3	A	0.11	8.4	A	0.1		0.13	8.6	A	0.13	8.8	A	0.2		0.21	9.2	A	0.22	9.5	A	0.2		0.17	8.9	A	0.17	9.2	A	0.3	
	WB	TR	0.18	8.4	A	0.22	8.7	A	0.3		0.24	8.9	A	0.35	10.0	A	1.1		0.26	9.5	A	0.38	10.7	B	1.3		0.29	9.6	A	0.45	11.5	B	1.9	
	NB	LT	0.12	8.2	A	0.12	8.3	A	0.1		0.10	8.3	A	0.11	8.5	A	0.3		0.15	8.8	A	0.16	9.1	A	0.3		0.14	8.7	A	0.15	9.1	A	0.4	
		TR	0.09	7.5	A	0.09	7.6	A	0.1		0.15	7.9	A	0.16	8.2	A	0.3		0.23	8.6	A	0.24	9.0	A	0.4		0.24	8.7	A	0.25	9.2	A	0.5	

Notes:
v/c = volume-to-capacity ratio; LOS = Level-of-Service
NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound; SEB = Southeastbound
L = Left-Turn; T = Through; R = Right-Turn;
LT = Left-Turn/Through; TR = Through/Right-Turn; LR = Left-Turn/Right-Turn; LTR = Left-Turn/Through/Right-Turn
Average Control Delay shown in units of seconds/vehicle
- = No volumes for this approach or movement.

Table 4-3

Peak Hour Level-of-Service Analysis Results, Year 2020 Comparison of Future No-Action and Mitigated With-Action Traffic Conditions

Intersection	Approach	Movement	Weekday AM Peak Hour (8:00 to 9:00 AM)								Weekday Midday Peak Hour (12:00 to 1:00 PM)								Weekday PM Peak Hour (5:00 to 6:00 PM)								Saturday Midday Peak Hour (12:45 to 1:45 PM)							
			2020 No-Action			2020 Mitigated-Action			Change in Delay	Impact?	2020 No-Action			2020 Mitigated-Action			Change in Delay	Impact?	2020 No-Action			2020 Mitigated-Action			Change in Delay	Impact?	2020 No-Action			2020 Mitigated-Action			Change in Delay	Impact?
			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS		
SIGNALIZED INTERSECTIONS																																
Allentown Lane-Veterans Rd West / Arthur Kill Road	EB	LTR	0.02	10.3	B	0.02	10.3	B	0.0		0.04	10.5	B	0.04	10.5	B	0.0		0.02	10.4	B	0.02	10.4	B	0.0		0.02	10.4	B	0.02	10.4	B	0.0	
	WB	LT	0.43	14.7	B	0.44	15.0	B	0.3		0.54	16.8	B	0.59	17.9	B	1.1		0.68	20.8	C	0.74	23.1	C	2.3		0.70	20.5	C	0.76	23.2	C	2.7	
		R	0.61	18.7	B	0.51	16.3	B	-2.4		0.82	27.6	C	0.84	29.1	C	1.5		0.61	18.7	B	0.70	21.5	C	2.8		0.76	23.3	C	0.88	31.7	C	8.4	
	NB	LTR	0.75	21.3	C	-	-	-	-		0.63	17.7	B	-	-	-	-		0.68	18.9	B	-	-	-	-		0.83	24.9	C	-	-	-	-	
		LT	-	-	-	0.34	13.1	B	-		-	-	-	0.27	12.4	B	-		-	-	-	0.27	12.3	B	-		-	-	-	0.33	12.8	B	-	
		R	-	-	-	0.59	17.3	B	-		-	-	-	0.49	15.4	B	-		-	-	-	0.55	16.4	B	-		-	-	-	0.69	19.4	B	-	
	SB	LTR	0.60	20.1	C	-	-	-	-		0.78	26.7	C	-	-	-	-		1.16	113.5	F	-	-	-	-		1.07	81.6	F	-	-	-	-	
		L	-	-	-	0.34	14.1	B	-		-	-	-	0.62	20.1	C	-		-	-	-	0.77	27.1	C	-		-	-	-	0.76	26.7	C	-	
		TR	-	-	-	0.29	12.7	B	-		-	-	-	0.32	13.0	B	-		-	-	-	0.43	14.4	B	-		-	-	-	0.34	13.2	B	-	
	Overall		**0.68**	**19.2**	**B**	**0.55**	**15.0**	**B**	**-4.2**		**0.80**	**22.3**	**C**	**0.73**	**19.2**	**B**	**-3.1**		**0.92**	**47.8**	**D**	**0.75**	**19.7**	**B**	**-28.1**		**0.91**	**36.6**	**D**	**0.82**	**22.4**	**C**	**-14.2**	
North Bridge Street / Arthur Kill Road	WB	LR	0.49	18.4	B	0.49	18.4	B	0.0		0.64	21.1	C	0.64	21.1	C	0.0		0.95	31.3	C	0.95	31.3	C	0.0		0.89	27.9	C	0.89	27.9	C	0.0	
	NB	T	0.54	12.1	B	0.61	13.4	B	1.3		0.45	11.0	B	0.49	11.5	B	0.5		0.49	11.5	B	0.54	12.1	B	0.6		0.59	12.9	B	0.66	14.0	B	1.1	
	SB	T	0.35	9.9	A	0.42	10.5	B	0.6		0.52	11.3	B	0.56	11.8	B	0.5		0.64	12.2	B	0.69	12.8	B	0.6		0.58	11.5	B	0.63	12.1	B	0.6	
	Overall		**0.52**	**13.2**	**B**	**0.56**	**13.7**	**B**	**0.5**		**0.56**	**14.2**	**B**	**0.59**	**14.4**	**B**	**0.2**		**0.76**	**18.9**	**B**	**0.79**	**19.0**	**B**	**0.1**		**0.71**	**17.4**	**B**	**0.75**	**17.7**	**B**	**0.3**	
Richmond Valley Road / Arthur Kill Road	WB	LR	0.61	26.1	C	0.67	28.6	C	2.5		0.89	45.0	D	0.90	46.4	D	1.4		0.91	46.6	D	0.93	49.9	D	3.3		0.93	51.2	D	0.94	53.1	D	1.9	
	NB	TR	0.67	11.7	B	0.71	12.6	B	0.9		0.53	9.7	A	0.57	10.3	B	0.6		0.64	11.2	B	0.68	11.9	B	0.7		0.67	11.5	B	0.72	12.6	B	1.1	
	SB	LT	0.68	13.5	B	-	-	-	-		1.14	87.9	F	-	-	-	-		1.42	202.6	F	-	-	-	-		1.38	184.7	F	-	-	-	-	
		L	-	-	-	0.52	13.9	B	-		-	-	-	0.65	13.8	B	-		-	-	-	0.63	10.1	B	-		-	-	-	0.69	13.4	B	-	
		T	-	-	-	0.45	8.9	A	-		-	-	-	0.58	9.7	A	-		-	-	-	0.92	14.3	B	-		-	-	-	0.83	12.9	B	-	
	Overall		**0.66**	**14.7**	**B**	**0.70**	**14.4**	**B**	**-0.3**		**1.06**	**51.8**	**D**	**0.73**	**17.9**	**B**	**-33.9**		**1.26**	**109.7**	**F**	**0.93**	**19.2**	**B**	**-90.5**		**1.23**	**97.2**	**F**	**0.86**	**19.7**	**B**	**-77.5**	
Richmond Valley Road / Page Avenue	EB	LTR	0.35	23.4	C	0.38	23.9	C	0.5		0.81	37.2	D	0.81	37.2	D	0.0		0.69	29.9	C	0.70	30.1	C	0.2		0.70	29.9	C	0.70	30.1	C	0.2	
	WB	LTR	0.38	24.1	C	0.38	24.1	C	0.0		0.55	27.9	C	0.55	27.9	C	0.0		0.66	31.1	C	0.66	31.1	C	0.0		0.50	26.6	C	0.50	26.6	C	0.0	
	NB	L	0.18	11.0	B	0.24	11.7	B	0.7		0.33	13.4	B	0.35	13.9	B	0.5		0.31	13.5	B	0.35	14.4	B	0.9		0.60	18.8	B	0.65	21.1	C	2.3	
		TR	0.80	20.8	C	0.82	21.5	C	0.7		0.74	19.1	B	0.78	20.4	C	1.3		0.69	17.8	B	0.72	18.8	B	1.0		0.89	25.2	C	0.94	30.4	C	5.2	
	SB	LTR	0.55	15.5	B	0.57	15.9	B	0.4		0.78	22.5	C	0.84	26.3	C	3.8		0.88	28.8	C	0.94	37.6	D	8.8		0.77	21.3	C	0.86	27.3	C	6.0	
	Overall		**0.64**	**19.6**	**B**	**0.65**	**20.0**	**B**	**0.4**		**0.79**	**23.9**	**C**	**0.83**	**25.4**	**C**	**1.5**		**0.81**	**25.3**	**C**	**0.85**	**28.7**	**C**	**3.4**		**0.82**	**24.4**	**C**	**0.85**	**28.4**	**C**	**4.0**	
South Bridge Street / Page Avenue-Boscombe Avenue	EB	L	0.47	26.1	C	0.47	26.1	C	0.0		0.50	26.7	C	0.50	26.7	C	0.0		0.62	29.4	C	0.62	29.4	C	0.0		0.68	31.5	C	0.68	31.5	C	0.0	
		R	0.40	11.8	B	0.12	11.1	B	-0.7		0.16	11.3	B	0.16	11.5	B	0.2		0.16	12.5	B	0.16	12.8	B	0.3		0.10	10.9	B	0.10	11.1	B	0.2	
	NB	T	0.12	11.0	B	0.40	11.8	B	0.8		0.40	11.8	B	0.42	12.0	B	0.2		0.38	11.6	B	0.39	11.8	B	0.2		0.44	12.2	B	0.47	12.4	B	0.2	
	SB	T	0.24	10.5	B	0.25	10.6	B	0.1		0.31	11.2	B	0.33	11.4	B	0.2		0.38	11.8	B	0.40	12.0	B	0.2		0.38	11.8	B	0.40	12.0	B	0.2	
	Overall		*	**13.7**	**B**	*	**14.1**	**B**	**0.4**		*	**14.1**	**B**	*	**14.2**	**B**	**0.1**		*	**15.4**	**B**	*	**15.4**	**B**	**0.0**		*	**15.8**	**B**	*	**15.8**	**B**	**0.0**	
Veterans Road West / Bricktown Way-KWVP WB off-ramp	EB	L	0.24	23.5	C	0.28	22.7	C	-0.8		0.60	36.3	D	0.76	43.4	D	7.1		0.52	29.7	C	0.77	42.0	D	12.3		0.66	39.5	D	1.18	147.3	F	107.8	yes
		TR	0.53	26.9	C	0.54	25.8	C	-1.1		0.52	27.0	C	0.66	28.3	C	1.3		0.63	29.0	C	0.82	36.1	D	7.1		0.65	29.4	C	0.89	41.8	D	12.4	
	WB	L	0.97	80.0	F	0.96	76.8	E	-3.2		0.90	62.9	E	1.16	141.8	F	78.9	yes	1.15	132.7	F	1.15	132.7	F	0.0		1.35	210.9	F	2.93	921.8	F	710.9	yes
		TR	0.44	24.7	C	0.36	22.3	C	-2.4		0.55	26.2	C	0.47	23.0	C	-3.2		0.44	23.9	C	0.43	23.9	C	0.0		0.58	25.0	C	0.58	26.1	C	1.1	
	NB	LTR	0.54	30.0	C	0.69	33.4	C	3.4		0.75	35.5	D	1.10	92.0	F	56.5	yes	0.73	34.3	C	1.05	74.8	E	40.5	yes	0.97	54.0	D	1.45	242.8	F	188.8	yes
		U-TURN	0.53	17.9	C	0.54	18.2	C	0.3		0.35	14.7	B	0.37	15.4	C	0.7		1.05	84.5	F	1.10	100.2	F	15.7		0.59	24.4	C	0.63	27.0	D	2.6	
	SB	L	0.27	30.6	C	0.30	32.8	C	2.2		0.49	34.9	C	0.58	40.4	D	5.5		0.76	45.6	D	0.76	45.8	D	0.2		0.75	43.5	D	0.75	43.8	D	0.3	
		TR	0.23	30.1	C	0.35	33.9	C	3.8		0.31	31.4	C	0.65	44.1	D	12.7		0.32	31.5	C	0.58	37.7	D	6.2		0.68	40.6	D	0.99	77.5	E	36.9	yes
	Overall		*	**31.7**	**C**	*	**31.9**	**C**	**0.2**		*	**32.5**	**C**	*	**59.1**	**E**	**26.6**		*	**42.9**	**D**	*	**64.7**	**E**	**21.9**		*	**55.2**	**E**	*	**185.0**	**F**	**129.8**	
Veterans Road West / Tyrellan Avenue	EB	LTR	0.35	17.3	B	-	-	-	-		0.57	20.3	C	-	-	-	-		0.58	20.5	C	-	-	-	-		0.64	21.8	C	-	-	-	-	
		L	-	-	-	0.16	15.7	B	-		-	-	-	0.27	27.4	C	-		-	-		0.24	27.1	C	-		-	-	-	0.46	33.2	C	-	
		TR	-	-	-	0.27	16.2	B	-		-	-	-	0.86	40.8	D	-		-	-		0.89	43.2	D	-		-	-	-	0.92	45.6	D	-	
	WB	LTR	0.40	17.9	B	0.34	17.1	B	-0.8		-	-	-	-	-	-	-		-	-	-	-	-	-	-		-	-	-	-	-	-	-	
		DefL	-	-	-	-	-	-	-		0.58	27.5	C	0.54	40.1	D	12.6		0.61	28.9	C	0.54	40.2	D	11.3		0.88	53.8	D	0.70	45.7	D	-8.1	
		TR	-	-	-	-	-	-	-		0.40	18.2	B	0.40	22.8	C	4.6		0.45	19.0	B	0.51	24.7	C	5.7		0.61	21.9	C	0.66	27.5	C	5.6	
	NB	DefL	0.60	24.4	C	0.67	27.6	C	3.2		1.01	78.8	E	0.69	37.2	D	-41.6		0.72	31.9	C	0.59	32.8	C	0.9		1.26	168.5	F	0.77	44.0	D	-124.5	
		TR	0.18	15.6	B	0.21	15.9	B	0.3		0.35	17.6	B	0.53	26.8	C	9.2		0.31	17.1	B	0.46	25.5	C	8.4		0.43	18.8	B	0.73	35.5	D	16.7	
	SB	LTR	0.23	15.9	B	-	-	-	-		0.54	20.1	C	-	-	-	-		0.38	17.5	B	-	-	-	-		0.60	20.9	C	-	-	-	-	
		L	-	-	-	0.03	14.2	B	-		-	-	-	0.08	21.0	C	-		-	-	-	0.06	20.7	C	-		-	-	-	0.08	19.8	B	-	
		TR	-	-	-	0.27	16.3	B	-		-	-	-	0.89	40.7	D	-		-	-	-	0.66	29.0	C	-		-	-	-	0.94	43.2	D	-	
	Overall		**0.50**	**18.4**	**B**	**0.51**	**18.5**	**B**	**0.1**		**0.79**	**27.5**	**C**	**1.10**	**36.3**	**D**	**8.8**		**0.66**	**21.2**	**C**	**1.03**	**33.1**	**C**	**11.9**		**1.07**	**39.1**	**D**	**1.34**	**40.5**	**D**	**1.4**	
Boscombe Avenue / Outerbridge Crossing ramps	EB	L	1.04	53.5	D	1.05	57.2	E	3.7		0.96	39.4	D	0.96	39.9	D	0.5		1.03	53.5	D	1.07	66.5	E	13.0	yes	1.01	35.7	D	1.01	34.6	C	-1.1	
		TR	0.25	4.9	A	0.26	4.9	A	0.0		0.37	5.8	A	0.40	5.6	A	-0.2		0.33	4.7	A	0.36	4.9	A	0.2		0.38	5.6	A	0.41	5.1	A	-0.5	
	WB	LT	0.72	40.3	D	0.75	41.5	D	1.2		1.00	66.4	E	1.01	67.3	E	0.9		0.66	30.8	C	0.72	32.6	C	1.8		1.08	76.2	E	1.08	74.4	E	-1.8	
		R	0.72	41.6	D	0.96	68.1	E	26.5	yes	1.11	103.1	F	1.81	403.6	F	300.5	yes	1.13	107.4	F	1.72	362.5	F	255.1	yes	1.55	286.0	F	1.29	157.2	F	-128.8	
	NB	LTR	0.20	32.8	C	0.20	32.8	C	0.0		0.01	30.6	C	0.01	31.4	C	0.8		0.11	34.2	C	0.11	34.2	C	0.0		-	-	-	-	-	-	-	
	SB	L	0.54	42.8	D	0.61	45.6	D	2.8		0.40	37.8	D	0.56	44.5	D	6.7		0.72	55.8	E	0.89	77.3	E	21.5	yes	0.36	34.3	C	0.50	38.4	D	4.1	
		LT	0.02	30.6	C	0.02	30.6	C	0.0		0.00	30.4	C	0.00	31.3	C	0.9		0.00	32.1	C	0.00	32.1	C	0.0		-	-	-	-	-	-	-	
		R	0.18	6.8	A	0.18	6.8	A	0.0		0.15	6.6	A	0.15	7.0	A	0.4		0.41	12.0	B	0.42	12.1	B	0.1		0.24	7.3	A	0.25	8.3	A	1.0	
	Overall		**0.99**	**38.4**	**D**	**1.03**	**44.4**	**D**	**6.0**		**0.90**	**48.3**	**D**	**0.98**	**37.5**	**D**	**-10.8**		**1.02**	**48.8**	**D**	**1.25**	**129.0**	**F**	**80.2**		**1.03**	**88.3**	**F**	**1.16**	**70.6**	**E**	-	

Table 4-3 (cont')

Peak Hour Level-of-Service Analysis Results, Year 2020 Comparison of Future No-Action and Mitigated With-Action Traffic Conditions

Intersection	Approach	Movement	Weekday AM Peak Hour (8:00 to 9:00 AM)								Weekday Midday Peak Hour (12:00 to 1:00 PM)								Weekday PM Peak Hour (5:00 to 6:00 PM)								Saturday Midday Peak Hour (12:45 to 1:45 PM)							
			2020 No-Action			2020 Mitigated-Action					2020 No-Action			2020 Mitigated-Action					2020 No-Action			2020 Mitigated-Action					2020 No-Action			2020 Mitigated-Action			
			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS	Change in Delay	Impact?	v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS	Change in Delay	Impact?	v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS	Change in Delay	Impact?	v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS	Change in Delay	Impact?
SIGNALIZED INTERSECTIONS																																
Boscombe Avenue / Tyrellan Avenue	EB	DefL	0.52	17.8	B	0.56	18.7	B	0.9		0.68	22.2	C	0.68	22.8	C	0.6		0.65	20.7	C	0.66	21.6	C	0.9		0.80	27.6	C	0.81	28.5	C	0.9	
		TR	0.03	11.5	B	0.03	11.5	B	0.0		0.04	11.5	B	0.04	11.5	B	0.0		0.04	11.5	B	0.04	11.5	B	0.0		0.05	11.6	B	0.05	11.6	B	0.0	
	WB	LTR	0.10	12.0	B	0.10	12.0	B	0.0		0.09	11.9	B	0.14	22.6	C	10.7		0.05	11.6	B	0.07	21.3	C	9.7		0.06	11.7	B	0.10	23.7	C	12.0	
	NB	LTR	0.07	17.4	B	0.07	17.4	B	0.0		-	-	-	-	-	-	-		0.01	16.9	B	0.01	16.9	B	0.0		0.00	16.8	B	0.00	16.8	B	0.0	
		DefL	-	-	-	-	-	-	-		0.01	16.9	B	0.01	16.9	B	0.0		-	-	-	-	-	-	-		-	-	-	-	-	-	-	
		TR	-	-	-	-	-	-	-		0.01	16.9	B	0.01	16.9	B	0.0		-	-	-	-	-	-	-		-	-	-	-	-	-	-	
	SB	LT	0.10	17.8	B	0.10	17.8	B	-		0.15	18.3	B	0.15	18.3	B	0.0		0.12	18.1	B	0.12	18.1	B	0.0		0.17	18.5	B	0.17	18.5	B	0.0	
		R	0.55	24.8	C	0.74	31.0	C	-		0.95	50.8	D	1.02	53.2	D	2.4		0.99	59.7	E	1.05	61.3	E	1.6		1.26	156.3	F	1.28	150.7	F	-5.6	
	Overall		**0.53**	**19.0**	**B**	**0.64**	**22.2**	**C**	**3.2**		**0.80**	**32.8**	**C**	**1.01**	**38.2**	**D**	**5.4**		**0.80**	**38.1**	**D**	**1.03**	**43.1**	**D**	**5.0**		**1.00**	**88.2**	**F**	**0.19**	**97.1**	**F**	**8.9**	
Bricktown Way / Veterans Road West	EB	L	0.19	15.7	B	0.25	16.4	B	0.7		0.37	17.8	B	0.56	21.1	C	3.3		0.41	18.3	B	0.60	22.1	C	3.8		0.64	22.4	C	0.90	37.0	D	14.6	
		R	0.00	14.0	B	0.00	14.0	B	0.0		0.05	14.4	B	0.05	14.4	B	0.0		0.04	14.4	B	0.04	14.4	B	0.0		0.06	14.5	B	0.06	14.5	B	0.0	
	NB	LT	0.07	7.3	A	0.07	7.3	A	0.0		0.14	7.7	A	0.15	7.8	A	0.1		0.17	7.9	A	0.17	7.9	A	0.0		0.18	8.0	A	0.19	8.0	A	0.0	
	SB	TR	0.38	9.1	A	0.37	9.1	A	0.0		0.52	10.2	B	0.56	10.7	B	0.5		0.42	9.5	A	0.46	9.9	A	0.4		0.62	11.0	B	0.69	11.9	B	0.9	
	Overall		**0.31**	**9.6**	**A**	**0.32**	**9.9**	**A**	**0.3**		**0.46**	**10.9**	**B**	**0.56**	**12.2**	**B**	**1.3**		**0.41**	**10.6**	**B**	**0.52**	**12.2**	**B**	**1.6**		**0.63**	**12.8**	**B**	**0.77**	**17.3**	**B**	**4.5**	
Englewood Avenue / Veterans Road West	EB	TR	0.01	10.2	B	0.29	9.5	A	-0.7		0.01	10.2	B	0.17	9.1	A	-1.1		0.01	10.2	B	0.17	10.2	B	0.0		0.01	10.2	B	0.15	15.2	B	5.0	
	WB	L	0.44	14.8	B	0.93	39.2	D	24.4		0.49	15.5	B	0.94	37.9	D	22.4		0.43	14.7	B	0.94	40.0	D	25.3		0.96	45.2	D	1.01	49.3	D	4.1	
		T	0.46	15.3	B	0.25	9.2	A	-6.1		0.51	16.0	B	0.09	8.6	A	-7.4		0.45	15.1	B	0.10	9.7	A	-5.4		0.34	13.4	B	0.10	7.6	A	-5.8	
	NB	L	0.01	10.3	B	0.01	13.5	B	3.2		0.00	10.2	B	0.00	12.7	B	2.5		0.01	10.3	B	0.02	11.6	B	1.3		0.02	10.4	B	0.03	14.4	B	4.0	
		R	0.20	9.3	A	0.32	12.1	B	2.8		0.41	10.9	B	0.57	13.8	B	2.9		0.49	11.7	B	0.67	16.6	C	4.9		0.63	14.1	B	0.86	27.3	D	13.2	
	SB	LTR	0.13	10.9	B	0.22	14.7	B	3.8		0.16	11.1	B	0.26	14.3	B	3.2		0.16	11.1	B	0.23	12.8	B	1.7		0.21	11.4	B	0.38	16.6	B	5.2	
	Overall		*	**12.6**	**B**	*	**20.0**	**C**	**7.4**		*	**13.1**	**B**	*	**22.3**	**C**	**9.2**		*	**12.7**	**B**	*	**22.1**	**C**	**9.4**		*	**26.6**	**C**	*	**31.0**	**C**	**4.4**	
Englewood Avenue / Veterans Road East	EB	LT	0.34	16.1	B	0.59	20.4	C	4.3		0.58	20.3	C	0.74	25.2	C	4.9		0.78	28.2	C	0.93	41.7	D	13.5		1.12	94.5	F	1.12	89.9	F	-4.6	
		R	0.05	13.1	B	0.30	15.6	B	2.5		0.12	13.7	B	0.22	14.6	B	0.9		0.13	13.8	B	0.25	14.2	B	0.4		0.18	14.2	B	0.28	12.0	B	-2.2	
	WB	LTR	0.11	13.6	B	0.18	14.3	B	0.7		0.09	13.4	B	0.12	13.7	B	0.3		0.14	13.9	B	0.17	13.5	B	-0.4		0.17	14.1	B	0.18	11.0	B	-3.1	
	NB	LTR	0.27	9.5	A	0.34	10.0	A	0.5		0.26	9.4	A	0.28	9.6	A	0.2		0.26	9.4	A	0.30	10.3	B	0.9		0.34	10.0	A	0.46	14.0	B	4.0	
	Overall		**0.30**	**11.3**	**B**	**0.45**	**13.6**	**B**	**2.3**		**0.39**	**13.3**	**B**	**0.47**	**15.6**	**B**	**2.3**		**0.48**	**16.8**	**B**	**0.58**	**22.7**	**C**	**5.9**		**0.67**	**43.1**	**D**	**0.80**	**43.8**	**D**	**0.7**	
Englewood Avenue / Bloomingdale Road	EB	LR	0.19	17.9	B	0.57	23.9	C	6.0		0.39	20.4	C	0.63	25.6	C	5.2		0.38	20.3	C	0.62	25.3	C	5.0		0.56	23.6	C	0.86	38.4	D	14.8	
	NB	LT	0.41	8.5	A	0.41	8.5	A	0.0		0.32	7.7	A	0.32	7.7	A	0.0		0.52	9.5	A	0.52	9.5	A	0.0		0.41	8.4	A	0.41	8.4	A	0.0	
	SB	TR	0.54	9.6	A	0.58	10.2	B	0.6		0.35	7.9	A	0.37	8.0	A	0.1		0.50	9.3	A	0.52	9.5	A	0.2		0.41	8.3	A	0.44	8.6	A	0.3	
	Overall		**0.43**	**9.9**	**A**	**0.57**	**12.4**	**B**	**2.5**		**0.37**	**10.2**	**B**	**0.45**	**12.7**	**B**	**2.5**		**0.47**	**10.8**	**B**	**0.55**	**12.6**	**B**	**1.8**		**0.46**	**11.7**	**B**	**0.57**	**17.3**	**B**	**5.6**	
Sharrotts Road / Bloomingdale Road	EB	LR	0.27	16.0	B	0.27	16.0	B	0.0		0.28	16.0	B	0.28	16.0	B	0.0		0.51	19.0	B	0.51	19.0	B	0.0		0.48	18.6	B	0.48	18.6	B	0.0	
	NB	LT	0.57	13.0	B	0.75	17.6	B	4.6		0.55	12.6	B	0.67	15.2	B	2.6		0.67	14.6	B	0.81	19.2	B	4.6		0.67	14.8	B	0.91	28.4	C	13.6	
	SB	TR	0.50	11.8	B	0.62	13.9	B	2.1		0.45	11.1	B	0.57	12.8	B	1.7		0.64	13.9	B	0.76	17.2	B	3.3		0.63	13.7	B	0.80	18.5	B	4.8	
	Overall		**0.45**	**12.9**	**B**	**0.56**	**15.8**	**B**	**2.9**		**0.44**	**12.5**	**B**	**0.52**	**14.2**	**B**	**1.7**		**0.61**	**15.2**	**B**	**0.69**	**18.3**	**B**	**3.1**		**0.59**	**15.0**	**B**	**0.74**	**22.4**	**C**	**7.4**	
Veterans Road East-Drumgoole Road West / Bloomingdale Road	EB	L	0.02	22.7	C	0.01	21.0	C	-1.7		0.06	23.1	C	0.05	21.3	C	-1.8		0.02	22.7	C	0.02	21.8	C	-0.9		0.12	23.7	C	0.08	19.9	B	-3.8	
		R	0.34	27.7	C	0.39	17.4	B	-10.3		0.63	35.3	D	0.74	37.5	D	2.2		0.57	33.1	C	0.76	41.5	D	8.4		0.79	43.3	D	0.83	38.6	D	-4.7	
	WB	LTR	0.69	21.4	C	0.85	27.5	C	6.1		0.71	21.7	C	0.81	25.7	C	4.0		0.88	25.0	C	0.95	31.1	C	6.1		0.94	28.7	C	1.01	41.2	D	12.5	
	NB	L	0.39	24.2	C	0.25	20.7	C	-3.5		0.44	23.7	C	0.44	20.2	C	-3.5		0.47	27.1	C	0.50	23.2	C	-3.9		0.64	36.4	D	0.76	39.6	D	3.2	
		T	0.39	17.2	B	0.39	17.2	B	0.0		0.32	16.3	B	0.32	16.3	B	0.0		0.37	16.7	B	0.37	16.7	B	0.0		0.40	17.2	B	0.47	20.5	C	3.3	
	SB	TR	0.99	36.5	D	0.98	38.1	D	1.6		0.62	20.3	C	0.37	15.9	B	-4.4		0.87	31.4	C	0.51	17.5	B	-13.9		0.69	21.4	C	0.48	19.1	B	-2.3	
	Overall		**0.76**	**26.4**	**C**	**0.69**	**28.3**	**C**	**1.9**		**0.66**	**21.9**	**C**	**0.63**	**23.4**	**C**	**1.5**		**0.82**	**26.4**	**C**	**0.72**	**26.7**	**C**	**0.3**		**0.80**	**27.2**	**C**	**0.86**	**34.1**	**C**	**6.9**	
South Service Road-Drumgoole Road East / Bloomingdale Road	EB	LTR	0.16	16.9	B	0.16	16.9	B	0.0		0.10	16.3	B	0.10	16.3	B	0.0		0.13	16.5	B	0.13	16.5	B	0.0		0.20	17.3	B	0.20	17.3	B	0.0	
	NB	LTR	0.41	9.2	A	0.47	9.8	A	0.6		0.43	9.3	A	0.49	10.0	A	0.7		0.44	9.4	A	0.50	10.1	B	0.7		0.49	9.9	A	0.56	11.0	B	1.1	
	SB	L	0.61	11.9	B	0.83	19.5	B	7.6		0.47	10.4	B	0.52	11.5	B	1.1		0.66	13.1	B	0.74	15.7	B	2.6		0.71	15.6	B	0.82	21.3	C	5.7	
		TR	0.67	11.6	B	0.72	12.6	B	1.0		0.50	9.8	A	0.55	10.4	B	0.6		0.62	11.0	B	0.68	11.8	B	0.8		0.56	10.2	B	0.63	11.1	B	0.9	
	Overall		**0.50**	**11.3**	**B**	**0.60**	**13.8**	**B**	**2.5**		**0.37**	**10.0**	**A**	**0.40**	**10.7**	**B**	**0.7**		**0.48**	**11.2**	**B**	**0.53**	**12.3**	**B**	**1.1**		**0.54**	**11.8**	**B**	**0.61**	**13.7**	**B**	**1.9**	
Pleasant Plains Avenue-Amboy Road / Bloomingdale Road	EB	LTR	0.09	14.8	B	0.10	16.6	B	1.8		0.06	14.5	B	0.06	14.5	B	0.0		0.09	14.7	B	0.09	15.3	B	0.6		0.06	14.5	B	0.07	15.1	B	0.6	
	WB	L	0.36	18.2	B	0.39	20.7	C	2.5		0.58	22.4	C	0.58	22.4	C	0.0		0.55	21.8	C	0.56	22.9	C	1.1		0.57	22.1	C	0.58	23.2	C	1.1	
		T	0.02	14.1	B	0.03	15.8	B	1.7		0.04	14.2	B	0.04	14.2	B	0.0		0.04	14.2	B	0.04	14.8	B	0.6		0.02	14.1	B	0.03	14.7	B	0.6	
		R	0.21	16.1	B	0.22	18.1	B	2.0		0.22	16.2	B	0.22	16.2	B	0.0		0.22	16.1	B	0.22	16.8	B	0.7		0.20	15.9	B	0.20	16.5	B	0.6	
	NB	LTR	0.52	20.5	C	0.55	19.1	B	-1.4		0.71	24.3	C	0.78	27.1	C	2.8		0.69	23.6	C	0.74	24.5	C	0.9		0.79	25.9	C	0.86	28.8	C	2.9	
	SB	LTR	1.08	64.8	E	1.09	67.9	E	3.1		0.78	27.4	C	0.87	33.5	C	6.1		0.93	30.9	C	1.00	41.1	D	10.2		0.86	30.6	C	0.96	40.3	D	9.7	
	Overall		**0.72**	**38.9**	**D**	**0.77**	**40.7**	**D**	**1.8**		**0.68**	**23.8**	**C**	**0.73**	**26.9**	**C**	**3.1**		**0.74**	**24.9**	**C**	**0.79**	**29.4**	**C**	**4.5**		**0.71**	**25.5**	**C**	**0.77**	**30.4**	**C**	**4.9**	
Arthur Kill Road / Bloomingdale Road	EB	TR	0.35	14.6	B	0.39	15.1	B	0.5		0.37	14.9	B	0.41	15.5	B	0.6		0.47	16.2	B	0.68	28.4	C	12.2		0.47	16.3	B	0.81	37.0	D	20.7	
	WB	LT	0.36	15.1	B	-	-	-	-		0.43	16.3	B	-	-	-	-		0.57	19.5	B	-	-	-	-		0.65	22.8	C	-	-	-	-	
		L	-	-	-	0.51	20.0	C	-		-	-	-	0.60	23.4	C	-		-	-	-	0.75	44.8	D	-		-	-	-	0.78	44.7	D	-	
		T	-	-	-	0.30	14.1	B	-		-	-	-	0.31	14.4	B	-		-	-	-	0.34	16.4	B	-		-	-	-	0.30	14.1	B	-	
	NB	LR	0.60	26.1	C	0.87	41.0	D	-		0.56	25.1	C	0.75	32.2	-	-		0.66	27.9	C	0.88	39.4	-	-		0.55	25.0	C	0.83	37.5	D	-	
	Overall		**0.47**	**18.8**	**B**	**0.67**	**25.3**	**C**	**6.5**		**0.49**	**18.7**	**B**	**0.67**	**22.2**	**C**	**3.5**		**0.61**	**21.0**	**C**	**0.88**	**32.8**	**C**	**11.8**		**0.61**	**20.7**	**C**	**0.86**	**34.9**	**C**	**14.2**	

Table 4-3 (cont')

Peak Hour Level-of-Service Analysis Results, Year 2020 Comparison of Future No-Action and Mitigated With-Action Traffic Conditions

Intersection	Approach	Movement	Weekday AM Peak Hour (8:00 to 9:00 AM)								Weekday Midday Peak Hour (12:00 to 1:00 PM)								Weekday PM Peak Hour (5:00 to 6:00 PM)								Saturday Midday Peak Hour (12:45 to 1:45 PM)							
			2020 No-Action			2020 Mitigated-Action					2020 No-Action			2020 Mitigated-Action					2020 No-Action			2020 Mitigated-Action					2020 No-Action			2020 Mitigated-Action			
			v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS	Change in Delay	Impact?	v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS	Change in Delay	Impact?	v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS	Change in Delay	Impact?	v/c	Average Control Delay	LOS	v/c	Average Control Delay	LOS	Change in Delay	Impact?
UNSIGNALIZED INTERSECTIONS																																
Sharrots Road / Arthur Kill Road	EB	LTR	0.07	13.9	B	0.09	16.6	C	2.7		0.23	15.5	C	0.26	17.5	C	2.0		0.29	20.7	C	0.34	25.4	D	4.7		0.54	24.5	C	0.65	34.9	D	10.4	yes
	WB	LTR	0.22	14.9	B	0.22	16.9	C	2.0		0.24	18.1	C	0.24	19.5	C	1.4		0.42	24.7	C	0.43	28.2	D	3.5		0.45	24.2	C	0.50	30.2	D	6.0	yes
	NB	LTR	0.03	8.0	A	0.03	8.3	A	0.3		0.03	8.0	A	0.04	8.1	A	0.1		0.03	8.0	A	0.03	8.2	A	0.2		0.01	8.0	A	0.01	8.2	A	0.2	
	SB	LTR	0.03	7.9	A	0.03	8.0	A	0.1		0.03	8.1	A	0.03	8.3	A	0.2		0.06	8.2	A	0.06	8.4	A	0.2		0.03	8.0	A	0.03	8.1	A	0.1	
Englewood Avenue / Arthur Kill Road	WB	LR	0.05	10.8	B	-	-	-	-		0.13	14.0	B	-	-	-	-		0.17	14.3	B	-	-	-	-		0.40	19.1	C	-	-	-	-	
		L	-	-	-	0.63	33.9	D	-		-	-	-	0.45	23.2	C	-		-	-	-	0.57	32.8	D	-		-	-	-	0.50	27.7	D	-	
		R	-	-	-	0.08	10.3	B	-		-	-	-	0.03	10.6	B	-		-	-	-	0.07	11.3	B	-		-	-	-	0.04	10.6	B	-	
	SB	LT	0.02	8.0	A	0.11	8.5	A	0.5		0.02	8.2	A	0.03	8.4	A	0.2		0.01	8.1	A	0.04	8.5	A	0.4		0.01	8.0	A	0.03	8.3	A	0.3	
South Bridge Street / Arthur Kill Road	SB	LT	0.18	10.8	B	0.19	11.2	B	0.4		0.19	10.3	B	0.20	10.6	B	0.3		0.29	11.5	B	0.30	11.9	B	0.4		0.27	11.7	B	0.28	12.2	B	0.5	
Bricktown Way / Tyrellan Avenue	EB	LT	0.05	8.0	A	0.14	9.3	A	1.3		0.10	9.1	A	0.39	15.0	C	5.9		0.12	8.7	A	0.39	14.4	B	5.7		0.22	9.6	A	0.72	29.5	D	19.9	
		TR	0.08	7.9	A	0.11	8.4	A	0.5		0.15	9.2	A	0.27	12.3	B	3.1		0.16	8.7	A	0.29	11.9	B	3.2		0.27	9.9	A	0.48	17.5	C	7.6	
	WB	LT	0.12	8.3	A	0.14	8.9	A	0.6		0.32	10.5	B	0.42	14.7	B	4.2		0.39	11.3	B	0.52	16.8	C	5.6		0.39	11.8	B	0.60	22.3	C	10.5	
		TR	0.06	7.7	A	0.13	8.2	A	0.5		0.10	8.2	A	0.31	11.6	B	3.4		0.14	8.5	A	0.35	12.4	B	3.9		0.20	9.3	A	0.60	21.0	C	11.7	
	NB	LT	0.02	7.8	A	0.05	8.8	A	1.0		0.07	8.7	A	0.22	12.3	B	3.6		0.03	8.5	A	0.15	11.5	B	3.0		0.10	9.4	A	0.33	16.0	C	6.6	
		R	0.03	7.0	A	0.03	7.7	A	0.7		0.06	7.7	A	0.09	9.9	A	2.1		0.11	8.2	A	0.17	10.7	B	2.5		0.14	8.8	A	0.23	13.1	B	4.3	
	SB	LT	-	-	-	0.07	8.8	A	-		-	-	-	0.34	13.3	B	-		-	-	-	0.35	13.9	B	-		-	-	-	0.61	23.4	C	-	
		TR	-	-	-	0.06	8.2	A	-		-	-	-	0.28	11.8	B	-		-	-	-	0.29	12.3	B	-		-	-	-	0.51	18.5	C	-	
Sharrots Road / Veterans Road West	EB	TR	0.13	8.4	A	0.13	8.6	A	0.2		0.13	8.4	A	0.13	8.6	A	0.2		0.23	8.9	A	0.24	9.1	A	0.3		0.20	9.0	A	0.20	9.0	A	0.0	
	WB	LT	0.30	9.5	A	0.41	10.7	B	1.2		0.34	9.9	A	0.48	11.9	B	2.0		0.42	11.1	B	0.57	13.7	B	2.7		0.64	16.0	C	0.64	16.0	C	0.0	
	SB	LT	0.07	8.2	A	0.09	8.5	A	0.3		0.12	8.5	A	0.13	8.9	A	0.4		0.11	8.8	A	0.12	9.2	A	0.4		0.14	9.4	A	0.14	9.4	A	0.0	
		TR	0.09	8.0	A	0.09	8.3	A	0.3		0.09	8.1	A	0.09	8.4	A	0.4		0.10	8.5	A	0.10	8.9	A	0.4		0.13	9.1	A	0.13	9.1	A	0.0	
Sharrots Road / Veterans Road East	EB	LT	0.11	8.4	A	0.11	8.6	A	0.1		0.14	8.7	A	0.14	9.0	A	0.2		0.23	9.5	A	0.24	9.9	A	0.3		0.19	9.6	A	0.19	9.6	A	0.0	
	WB	TR	0.24	8.8	A	0.34	9.8	A	0.9		0.30	9.5	A	0.44	11.2	B	1.7		0.36	10.6	B	0.51	13.0	B	2.4		0.60	14.8	B	0.60	14.8	B	0.0	
	NB	LT	0.12	8.4	A	0.13	8.6	A	0.3		0.11	8.5	A	0.12	8.8	A	0.3		0.16	9.1	A	0.17	9.5	A	0.4		0.17	9.6	A	0.17	9.6	A	0.0	
		TR	0.10	7.6	A	0.10	7.9	A	0.2		0.16	8.1	A	0.17	8.5	A	0.4		0.24	9.0	A	0.26	9.5	A	0.5		0.28	9.8	A	0.28	9.8	A	0.0	

Notes:
v/c = volume-to-capacity ratio; LOS = Level-of-Service
NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound; SEB = Southeastbound
L = Left-Turn; T = Through; R = Right-Turn;
LT = Left-Turn/Through; TR = Through/Right-Turn; LR = Left-Turn/Right-Turn; LTR = Left-Turn/Through/Right-Turn
Average Control Delay shown in units of seconds/vehicle
- = No volumes for this approach or movement.