

A. INTRODUCTION

This chapter examines a number of alternatives to the proposed Fresh Kills Park Plan. In accordance with the Final Scope of Work issued in August 2006, this analysis considers the following alternatives:

- The No Action Alternative, which assumes no rezoning or other proposed actions;
- A Two-Lane Park Road Alternative;
- Alternative Richmond Hill Road Connection Alignment (west of Landfill Section 6/7); and
- A Lesser Impact Alternative.

This analysis first examines the No Action Alternative, in which the proposed project and other actions are assumed to not be approved.

The second alternative assumes a Two-Lane Park Road and is compared with the proposed Four-Lane Park Road design that is presented at the proposed project in this Generic Environmental Impact Statement (GEIS). The Alternative Road Alignment (west of Landfill Section 6/7) assumes that the Richmond Hill Road Connection (a 2036 project) is constructed along the west side of Landfill Section 6/7 rather than along the eastern alignment presented in this GEIS. The 2016 Proposed Roads Alternative is an examination of conditions that assume the proposed 2016 road network is developed, but not the 2016 park program.

B. NO ACTION ALTERNATIVE**DESCRIPTION**

The No Action Alternative assumes that the proposed project is not implemented. This includes no mapping of parkland and the corresponding amendments to the zoning map; no mapping of new roadways and demapping of unbuilt paper streets; no acquisition of private land for a proposed park road connection; and no capital funding for the construction of public facilities. This alternative essentially reflects conditions discussed as the “Future Without the Proposed Project” in Chapters 2 through 21 through the analysis years 2016 and 2036. This analysis compares conditions under the No Action Alternative to conditions with the proposed project through 2036.

LAND USE, ZONING AND PUBLIC POLICY

Under the No Action Alternative, it is assumed that the project site would remain as Fresh Kills Landfill and the associated properties undergoing final closure through the completion of final closure construction and post closure monitoring and maintenance. No other development is expected on the project site through the 2016 and 2036 analysis years. Closure construction at both Landfill Sections 1/9 and 6/7 will be completed by 2016. This would include the

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installation of final cover on the landfill mounds and implementation of all environmental control and monitoring systems.

There are a number of projects that are expected to take place in the study area under the No Action Alternative. These projects include roadway improvements, commercial, residential, and hotel construction, and industrial projects.

The benefits to the area expected to result from the proposed action—including the creation of a 2,163-acre regional park and public access to the waterfront—would not be realized under this alternative.

SOCIOECONOMIC CONDITIONS

As stated above, the project site would remain a closed landfill absent the proposed project and no other development is expected on the project site absent the proposed project. After closure of the landfill, a small number of employees would remain to oversee the maintenance and operations of the closed landfill. The study area would see nominal increases in both the residential population and employees in the future without the project. Neither the proposed action nor the No Action Alternative would displace populations, employees, or businesses. However, the project's goals of creating a park to complement both the existing residential neighborhoods surrounding the project site and the region as a whole would not be met under the No Action Alternative.

COMMUNITY FACILITIES

Under the No Action Alternative, the project site would remain a closed landfill and there would be an increase in the residential population of the study area. However, like the proposed project, the No Action Alternative would not have any significant adverse impacts on community facilities.

OPEN SPACE

Under the No Action Alternative, the 2,163-acre park that would result from the proposed project would not be constructed. Therefore, under the No Action Alternative, although open space ratios in the area are adequate due to the large existing parks, open space ratios for the study area population would not see the dramatic increase that would occur under the future with the proposed project.

SHADOWS

In the No Action Alternative, wind turbines would not be constructed on the project site and no new shadows would be cast. However, the shadows from the wind turbines under consideration with the proposed project would be very slender, and would not be expected to impact open space users and activities that are proposed within the park, nor would they be expected to impact in any way the planting program that is proposed in these areas.

HISTORIC RESOURCES

Under the No Action Alternative, it is assumed that the project site would remain a closed landfill and no development on the site would occur, therefore, it is expected that no potential impacts to archaeological resources would occur. With the proposed project, it is recommended that individual construction projects be reviewed by an archaeologist to determine if the project

could impact locations that were identified in the Phase 1A archaeological documentary study (see GEIS Appendices) as possessing moderate, moderate to high, or high sensitivity for pre-contact or historic-period archaeological resources.

With respect to architectural resources, under the No Action Alternative, it is assumed that the project site would remain a closed landfill and no development on the site would occur. Similarly, no significant adverse impacts are expected in the future with the proposed project. One architectural resource, the Sleight Family Cemetery (a.k.a. Blazing Star Burial Ground) New York City Landmark (NYCL) is located in the project site; however, no direct or indirect impacts to this resource are expected to result from the proposed project, and no construction activities are currently planned within 90 feet of this resource.

URBAN DESIGN AND VISUAL RESOURCES

Under the No Action Alternative, it is assumed that the visual enhancements associated with the construction of the proposed park would be foregone. Although there are a number of projects anticipated to be completed in the study area, these projects would not involve any alterations to block form, streetscape, street pattern or hierarchy, natural resources, or topography. A number of these projects, described in Chapter 2, “Land Use, Zoning, and Public Policy,” are road improvement projects, but they would not alter alignments or configurations or create new streets.

NEIGHBORHOOD CHARACTER

The No Action Alternative would not provide the benefits to neighborhood character associated with the proposed project, nor would it have either the positive or negative impact on traffic patterns that occur under the proposed project. However, under this alternative, the land use, open space, natural resources, and urban design benefits to the local neighborhood of the proposed project would be foregone.

NATURAL RESOURCES

Neither the No Action Alternative nor the proposed project would result in significant adverse impacts on natural resources or water quality. In general, implementation of the post-closure monitoring and maintenance activities in the No Action Alternative would not result in significant adverse impacts to terrestrial or aquatic natural resources within the project site. The natural resources within the project site would be expected to be similar to those present under the existing condition, with some changes occurring naturally due to successional changes in the plant community. *Phragmites* would likely continue to invade portions of the *Spartina*-dominated saltmarsh within the project site where tidal flow is restricted. Upland and wetland woodlands on the site would continue to mature, and where contiguous to other woodlands (e.g., at the southern portion of the project site south of Landfill Section 2/8, just north of Arden Heights Woods), may support wildlife characteristic of forest interior landscape. Palustrine emergent and scrub-shrub wetlands would continue to mature and may gain additional woody plant species. Invasive plant species would continue to invade the project site. The tidal creeks and wetlands, freshwater wetlands and open water areas, woodlands and fields would continue to provide landscape for fish and wildlife currently described as using the landscapes present within the project site. In addition, with this alternative, the benefits of the proposed project would be foregone, including the extensive enhancement of landscape.

HAZARDOUS MATERIALS

In the No Action Alternative, it is assumed that landfill closure would be completed in accordance with approved DSNY closure plans with oversight by the New York State Department of Environmental Conservation (NYSDEC). It is expected that closure construction at Landfill Sections 6/7 and 1/9 will be completed by 2016. The leachate collection and containment system and landfill gas management system would continue to operate after landfill closure as required by NYSDEC. Without the proposed project, no other development is expected on the project site through the 2016 and 2036 analysis years. The remediation of contamination in areas where spills have not been reported, or for which there is no other regulatory action, would likely take place only if contamination were encountered during soil disturbance as part of New York City Department of Sanitation DSNY operations. Overall, in the No Action Alternative there would be a low potential for disturbance of hazardous materials, but there would likely be less extensive remediation of hazardous materials than would be associated with the future with the proposed project.

While a greater intensity of construction would occur with the proposed project as compared to the No Action Alternative, this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to eliminate the potential for any impacts from hazardous materials. The No Action Alternative would also not include the final covering of the project site with soils that are acceptable for park use.

WATERFRONT REVITALIZATION PROGRAM

The No Action Alternative would not be consistent with City coastal zone objectives or waterfront plans for the site. Most notably, the No Action Alternative would continue to preclude public access to the waterfront and would not improve scenic views to the water that would be provided with the proposed project.

In contrast, the proposed project would be consistent with the Waterfront Revitalization Program (WRP) policies and standards. Most importantly, the development of a public park on the project site would be consistent with the borough and City goals for revitalizing and providing public access in the coastal zone.

INFRASTRUCTURE

Under the No Action Alternative, increased project demands on infrastructure would not occur; however neither this alternative nor the proposed project would cause increases to the degree that there would be significant adverse impacts on these services.

SOLID WASTE AND SANITATION SERVICES

Under the No Action Alternative, it is assumed that the final closure construction of all the landfill sections would be completed by 2016, and by 2036, all landfill sections would be closed and DSNY would continue to operate and manage the Fresh Kills Landfill environmental control systems, along with implementation of the monitoring and maintenance programs. It is expected that the City would continue to manage and transport its solid waste and recyclables through the 2036 analysis year. It is also assumed that the Staten Island Waste Transfer Station would continue to operate and handle the borough's waste stream.

For the project site, the increased demands on solid waste and sanitation services would be less in the No Action Alternative than under the proposed project, but neither this alternative nor the proposed

project would result in increases to the degree that there would be significant adverse impacts on these services.

ENERGY

Under the No Action Alternative, the increased demands on energy systems would be smaller than those under the proposed project, but neither this alternative nor the proposed project would cause significant adverse impacts on utilities.

TRAFFIC AND PARKING

TRAFFIC

In the No Action Alternative, traffic and parking demand levels in the study area would increase as a result of general background growth and future developments in the area. Under the 2016 No Action Alternative conditions, of the 30 intersections analyzed, 23 intersections would experience congestion on one or more movements in the AM peak hour, 21 intersections in the midday peak hour, 23 intersections in the PM peak hour, 23 intersections in the Saturday midday peak hour, and 20 intersections in the Saturday PM peak hour. Under the 2036 No Action Alternative conditions, of the 30 intersections analyzed, 25 intersections would experience congestion on one or more movements in the AM peak hour, 24 intersections in the midday peak hour, 27 intersections in the PM peak hour, 26 intersections in the Saturday midday peak hour, and 25 intersections in the Saturday PM peak hour.

PARKING

Under the proposed project no impacts would occur on local parking. Thus, conditions would be similar to the No Action Alternative.

TRANSIT AND PEDESTRIANS

The proposed project would not adversely impact transit and pedestrian conditions. Thus, conditions in the No Action Alternative would not be significantly different from that under the proposed project.

AIR QUALITY

With respect to mobile sources, no violations of the National Ambient Air Quality Standards (NAAQS) are predicted to occur under either the No Action Alternative or under the proposed project. In addition, as under the proposed project, the No Action Alternative would not result in impacts from heating systems.

NOISE

Under the proposed project no impact would occur at local sensitive receptors. Thus, conditions under this No Action Alternative would be similar to the proposed project.

CONSTRUCTION

Since the No Action Alternative would entail only the closure of the landfill, this alternative would not generate as much construction activity or disruption as the proposed project. Construction-related impacts on historic archaeological and architectural resources would be similar since the same sites would have the potential to be impacted, though with the proposed project, measures would be put in place during construction to ensure that impacts do not occur.

The No Action Alternative would not have the construction-related noise and traffic of the proposed project. However, neither this alternative nor the proposed project would result in significant adverse impacts on air quality, noise, traffic, or transit during construction.

PUBLIC HEALTH

In the No Action Alternative, it is assumed that landfill closure will be completed in accordance with approved DSNY closure plans with oversight by NYSDEC. It is expected that closure construction at Landfill Sections 6/7 and 1/9 will be completed by 2016. The leachate collection and containment system and landfill gas management system will continue to operate after landfill closure as required by NYSDEC. Without the proposed project, no other development is expected on the project site through the 2016 and 2036 analysis years.

While a greater intensity of construction would occur with the proposed project as compared to the No Action Alternative, this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to minimize any impact from hazardous materials.

MITIGATION

Under the No Action Alternative, there would not be the significant impacts of the proposed project (e.g., traffic, wetlands) that require mitigation.

UNAVOIDABLE ADVERSE IMPACTS

Like the proposed project, the No Action Alternative would not have any unavoidable adverse impacts.

C. TWO-LANE PARK ROAD ALTERNATIVE¹

INTRODUCTION

The purpose of this alternative is to provide a comparison of the four lane road design presented in this GEIS with a narrower road footprint. The principal areas of comparison are the physical geometric differences between a two-lane and four-lane road design, potential landfill conflicts, environmental impacts, park design conflicts, and costs. A detailed description of the alternative follows with a comparison analysis.

¹ Details on the alternative designs are presented in the Road Alternatives Report, Arup et al., January 2008.

DESCRIPTION OF THE ALTERNATIVE

The two-lane alternative design assumes two 12-foot travel lanes, a 4-foot textured median, and 6-foot shoulders (see Figure 22-1). The combination of median and shoulder widths would allow for bypassing of stalled vehicles, so that a single stopped vehicle does not block an entire direction of travel. The shoulders would also contribute to improved sight distance along the inside of curved roadway segments and help keep the roadside clear of hazards.

With respect to the Forest Hill Road and Richmond Hill Road Connections, the road coverage associated with this two-lane alternative would differ from that under the four-lane alternative in terms of magnitude or extent. This provides certain advantages. For example, the smaller footprint of the two-lane alternative would provide a significant advantage in the segment along the berm along Richmond Avenue. While the base of the roadway embankment would be approximately 80 percent as wide as the four-lane at the basin crossings, along the berm the narrower two-lane width would require 50 percent less width into the basins and wetlands.

In addition, under the two-lane alternative, the Loop Park Road configuration plus pedestrians and bicycles requires roughly 57 feet of width at the bridge crossings. The existing bridge provides 50 feet between the parapets. However, in this alternative, unlike with the four-lane design, proposing a narrower configuration to avoid the cost of widening the bridge or constructing a second bridge (as with the proposed project) would be feasible, and is typical of situations in which the New York State Department of Transportation (NYSDOT) approves retaining substandard features. Therefore, the proposed two-lane alternative narrows the roadway to 50 feet. Other modifications, such as narrowing or eliminating the median or narrowing the traffic lanes to 11 feet, could also be considered.

In this two-lane alternative, since the bridge would have a shared vehicular/pedestrian function, a second barrier or rail would need to be added to separate the roadway from the bicycle/pedestrian path. A steel bicycle rail would also be added on the outboard side of the pedestrian sidewalk.

Similarly, under the two-lane alternative, since the Richmond Creek Bridge is exactly the same width as the Main Creek Bridge (50 feet), the same alternative design assumptions apply, and this alternative would be substantially identical to the Main Creek Bridge (two-lane alternative). Two lanes of traffic and pedestrians and cyclists would be accommodated on the existing reconfigured bridge, with the same constraints and similar opportunities for improving the appearance of the structure. As a result, under this alternative, costs are reduced, as are wetland impacts from new bridges over Main and Richmond Creeks.

In addition to the elimination of the pedestrian/bicycle bridges over the creeks, a two-lane alternative at the north shore underpass and south shore underpass below the West Shore Expressway would require a total width of 60 feet to accommodate the traffic lanes, pedestrian/bicycle path and barriers in this configuration. The width of the existing roadway and barriers on the north shore is roughly 40 feet. Therefore the proposed new north shore bulkhead would be located roughly 20 feet out from the back of the existing south (water side) barrier. The width of the existing roadway and barrier on the rough shore is roughly 28 feet. Therefore the proposed new south shore bulkhead would be located roughly 32 feet out from the back of the existing south (water side) barrier.

With the four-lane design, these wetland impacts are reduced (see the discussion below). In addition, these impacts could be further reduced if the proposed roadway cross section were narrowed. Options for doing so include eliminating the 4-foot median, reducing the width of the

shoulders from 6 feet to as little as 2 feet, and reducing the lane widths from 12 feet to 11 feet. Reducing the bicycle path from 10 feet to 8 feet could be considered. These design options could further reduce or eliminate these impacts under this alternative.

A more detailed comparison of the four-lane design with this two lane road alternative follows.

OVERVIEW OF ENVIRONMENTAL IMPACTS

The Two-Lane Park Road Alternative would have impacts similar to the proposed project with its four-lane park road proposal with a few key exceptions. Like the proposed project, under the Two-Lane Park Road Alternative, it is assumed that the project site would developed as a park with proposed access roads. The benefits expected to result from the proposed project—including the creation of a 2,163-acre regional park and public access to the waterfront—would also be realized under this alternative. Neither the proposed project nor the alternatives would have an impact on socioeconomic conditions or community facilities. Both would provide significant open space benefits as well as benefits for urban design and visual resources. Neither would have shadow impacts or impacts on historic architectural resources. Both have the potential to impact archaeological resources, which would have to be addressed as the project designs are advanced in order to determine if specific areas of archaeological impact could occur and if any field research is necessary. Neither would significantly adversely impact neighborhood character. Hazardous materials impacts would be similar, although a somewhat greater intensity of construction would occur with the proposed project as compared to the Two-Lane Park Road Alternative, this additional construction is not expected to greatly affect the project's need to comply with all applicable city, state and federal requirements to eliminate the potential for any impacts from hazardous materials including on-site testing of soils, as necessary.

Both would be generally consistent with the City waterfront revitalization program policies. Most importantly, the development of a public park on the project site would be consistent with the borough and City goals for revitalizing and providing public access in the coastal zone. Under both the four-lane proposal and the Two-Lane Park Road Alternative, the increased demands on solid waste and sanitation services would be similar and neither this alternative nor the proposed project would result in increases to the degree that there would be significant adverse impacts on these services. Likewise, the increased demands on energy systems would be smaller than those under the proposed project, but neither this alternative nor the proposed project would cause significant adverse impacts on utilities. While a greater intensity of construction would occur with the proposed project as compared with this alternative, as it relates to the roads, like the proposed project this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to minimize any public health impacts. In addition, other requirements of the proposed project with respect to public health protections would also be provided to protect public health. Traffic volumes would be the same, thus the traffic impacts would be similar, as would the impacts on air and noise conditions. Impacts on transit and pedestrians would also be similar. With the proposed project, there would be no unavoidable adverse impacts. All impacts of the proposed project would be avoided or mitigated.

Where the proposed project and this alternative differ is primarily in the areas of road design and engineering, conflicts with infrastructure and landfill systems, natural resources, and park design. The differences between the four-lane road design and this alternative are described in greater detail below.

TWO-LANE PARK ROAD ALTERNATIVE DETAILED COMPARISON OF IMPACTS

As stated above, the footprint of the Two-Lane Park Road Alternative is such that the two-lane roadway width, in addition to the full width path for pedestrians and bicyclists, falls within the paved width of the Four-Lane roadway that was analyzed for impacts in this GEIS.

SOUTH LOOP PARK ROAD (2016)

- *Geometry.* The Two-Lane Park Road Alternative differs from the Four-Lane designs at the crossing beneath the West Shore Expressway overpasses and at Richmond Creek Bridge, where the Two-Lane Park Road Alternative maintains a typical cross section.
The narrower Two-Lane Park Road Alternative would require less roadway outside (waterward) of the existing shoreline. It may be possible to further reduce the width under the West Shore Expressway by eliminating the median and reducing the shoulders which further reduce the impact on the Kills, but would not be optimal from a design perspective (i.e., risk that a stalled vehicle could block travel in that direction). However, the Two-Lane Park Road Alternative does allow for both the roadway and the path for pedestrians and bicyclists to be located on the existing Richmond Creek Bridge.
- *Landfill Conflicts.* Under this alternative, the outfall from Stormwater Basin K1 (serving Landfill Section 1/9) would need to be extended, though at shorter distance than with the Four-Lane proposal. In the vicinity of Landfill Section 2/8, the proposed roadway fits comfortably within the footprint of the existing DSNY service road. As with the Four-Lane proposal, the landfill utilities that lay below the existing roadbed need to be protected and their manhole and valve covers and related hardware need to be raised in order to be flush with the new surface. An entrance/exit point from South Loop Road Park would also be provided at the Landfill Section 2/8 Flare Station.
- *Environmental Impacts.* The two-lane South Loop Park Road extends 31 feet into the Fresh Kills shoreline under the West Shore Expressway. The tidal wetland impacts for the Two-Lane Park Road Alternative totals approximately 0.31 acres of regulated tidal open water (as compared with 0.7 acres under the four-lane proposal). This shoreline is currently degraded, steep sloped, and the water is both deep and shaded. As with the four-lane proposal, the potential tidal wetland impacts at this location could be offset by tidal wetland creation and enhancements at other locations, although the extent of the mitigation would be less. In addition, no new pedestrian/bikeway bridge is required over Main Creek. Under the four-lane proposal this new bridge would require new piles into Main Creek and the decking and coverage of the proposed bridge. Like the four-lane proposal, the Two-Lane Park Road Alternative has minimal environmental impact elsewhere as it occupies more or less the alignment of existing DSNY service haul roads in this segment.
- *Park Design Conflicts.* Under this alternative, pedestrians and cyclists could share the existing Richmond Creek Bridge, which is wide enough to allow for physical separation of cars and buses from non-motorized lanes. The small program area at the Terrace would also not be compromised by a narrower South Loop Road.

NORTH LOOP PARK ROAD

- *Geometry.* Like the four-lane-road proposal, this Two-Lane Park Road Alternative alignment includes curves with a 300-foot radius at the West Shore Expressway Bridge crossing. The West Loop Park Road profile is provided in Figure 22-2. In this segment, the

Two-Lane Park Road Alternative differs from the Four-Lane Alternative at the crossing beneath the West Shore Expressway and at Main Creek Bridge.

In the segment beneath the highway, as with the South Loop Road, the Two-Lane Park Road Alternative maintains a typical cross section, but requires less roadway extension into the water and tidal wetlands as compared with the Four-Lane Alternative. Additionally, the Two-Lane Park Road Alternative allows for a full width path for pedestrians and bicyclists to be located on the existing Main Creek Bridge. Like the South Loop Park Road the proposed road under this alternative would require some modifications to existing landfill infrastructure including a drainage outfall serving the West Shore Expressway that needs to be extended or replaced.

- *Landfill Conflicts.* The proposed two-lane alternative alignment passes close to, but is designed to avoid, intruding into Landfill Section 3/4 and its completed closure system. However, the alignment traverses landfill Stormwater Basins Q and F. However, the modifications what would be necessary to these systems would be similar to the four-lane proposal. In addition, as with the four-lane proposal, access points are to be provided to accommodate landfill post-closure operation and maintenance activities, the section 3/4 landfill gas flare station and the basins. .
- *Environmental Impacts.* The two-lane North Loop Park Road extends into the creek in the area under the West Shore Expressway bridges, extending the existing shoreline out into the water by 19 feet, thus impacting NYSDEC mapped tidal wetlands and regulated tidal open water. However, the shoreline area is degraded and steep-sloped and the water is deep and shaded. Thus, a with the four-lane proposal, impacts of this filling could be mitigated by tidal wetlands at other locations in the park although the extent of the mitigation would less than under the four-lane proposal. In addition, no new pedestrian/bikeway bridge is required over Main Creek. Under the four-lane proposal this new bridge would require new piles into Main Creek and the decking and coverage of the proposed bridge. Otherwise, like the four-lane proposal, the Two-Lane Park Road Alternative has minimal environmental impact elsewhere as it occupies more or less the alignment of existing DSNY service haul roads in this segment.
- *Park Design Issues.* Like the four-lane proposal, the Two-Lane Park Road proposal for this segment provides a graceful, arcing access road to the Creek Landing and the almost entirely non-motorized North Park. However, the two-lane version of this road preserves more space for waterfront and park activity in the Creek Landing, and prioritizes park recreational activities like bike and pedestrian path alignments. No new pedestrian and cycle bridge over Main Creek is required, a significant advantage in terms of park development.

EAST LOOP PARK ROAD

Similar to the Four-Lane Alternative, the Two-Lane Park Road Alternative presents two options for East Loop Road. Both are described below.

- *Geometry.*
 - *Option 1.* This option involves separate northbound and southbound roadways, each including two 6-foot-wide shoulders and one 12-foot-side wide travel lane, to allow for bypass of stalled vehicles. Under the Four-lane Alternative, some curves have non-standard radii.

- *Option 2.* This option involves a single roadway with 6-foot-wide shoulders, two 12-foot-wide travel lanes and a 4-foot median. It includes compact single lane roundabouts at both ends, which allow them to be placed in a more desirable locations based on NYSDOT and FHWA design guidelines for roundabouts. To narrower its footprint, Option 2 adheres more closely to the existing DSNY roadbed in the two-lane than in the four-lane version.
- *Infrastructure.* There are no known infrastructure elements unrelated to the landfill in the vicinity of East Loop Road (either Option 1 or Option 2). As with the other landfill segments discussed above, the four-lane proposal, the landfill gas transmission manhole covers would need to be raised to the new surface elevation and other modifications would be necessary.
- *Landfill Conflicts.*
 - *Option 1.* The west leg of the Two-Lane Park Road Alternative occupies the bed of an existing DSNY service road. Like the four-lane proposal, the Two-Lane Park Road Alternative has reduced storage capacity in the Basin C2 due to encroachment by the park road. This can be addressed by modifying the existing culvert connection between Basin C1 and C2. In addition, the extent of the encroachment associated with the Two-Lane Park Road Alternative is less than that for the Four-Lane Alternative due to the narrower roadway width.
 - *Option 2.* Under this option, the north roundabout sits over the landfill cutoff wall and leachate trench as well as a landfill gas transmission main. Construction of protective concrete slabs above the leachate cutoff wall, as described for Option 1 is proposed.
- *Environmental Impacts.* Like the four-lane proposal, the Two-Lane Park Road Alternative has no tidal wetland impacts in this segment.
- *Park Conflicts.* Like the four-lane proposal, Option 1 under this alternative infringes less on a flat area in the northwest portion of this planning area, allowing the construction of a larger parking lot for park use.

FOREST HILL ROAD CONNECTION

Under this alternative, the Two-Lane Park Road Alternative for the Forest Hill Road connection follows a similar horizontal alignment and profile as for the Four-Lane proposal. At the intersection with Richmond Avenue, the two-lane approach provides an eastbound left turn bay approaching Richmond Avenue as well one through and one right turn lane, along with restriping of northbound Richmond Avenue to provide a left turn bay onto Forest Hill Road and re-striping for a right turn bay from southbound Richmond Avenue. The specific differences between this proposal and the proposal project are as follows:

- *Geometry.* The Two-Lane Park Road Alternative is a wide road but is similar to the Four-Lane proposal in its geometry, with a sweeping and curvilinear alignment that minimizes interference with landfill infrastructure elements. It meets or exceeds the design criteria along its length and veers no more than 20 feet from the footprint of the Four-Lane proposal.
- *Landfill Conflicts.* Like the four-lane proposal, the Two-Lane Park Road Alternative passes over Section Landfill 6/7 and must account for these conditions and potential conflicts in the same manner as the Four-Lane proposal. The specific features and systems that may be influenced by the road alignment include: final cover protections and the foundation support properties of the solid waste in the landfill, and protection of the landfill gas, stormwater, and leachate management system.

The placement of the road over the landfill final cover system requires a detailed evaluation of potential sliding of the roadway embankment along the interface between the landfill geosynthetic drainage layer and geosynthetic barrier layer. Due to the narrower road width of road in the Two-Lane Park Road Alternative this is expected to apply a lesser load to the landfill surface than the four-lane proposal. Nonetheless, like the four-lane proposal, this alternative would densify the waste beneath the roadbed ahead of road construction in a similar manner. Like the our lane alternative, this alignment crosses the southern landfill gas collection header ring at two locations, crosses eight lateral landfill gas collection pipes and passes over one landfill gas extraction well. Like the four-lane proposal this alternative requires that landfill gas lines be rerouted through a protective carrier pipe that would protect the pipes from crushing, and allow access to flush the pipes, remove condensate, or if needed remove and replace the pipes. With this alignment, the landfill gas wells are to be either decommissioned and reinstalled outside of the alignment or be provided with a lateral header connection from outside of the roadway.

The two-lane road alternative would also include placement of lateral vent channels perpendicular to the road alignment at a one vent per 200-foot spacing for sampling the soil vapor beneath the road.

As with the four-lane proposal, swales and ditches would be introduced to intercept runoff that would otherwise flow onto the road. Swales would be placed along much of the north edge of the road to intercept mound runoff on the uphill side. A culvert would also be added under the roadway on the west side to convey flows westward toward Basin C2. The length of this culvert under this alternative is less than that required for the Four-Lane proposal.

Similar to the Four-Lane proposal, as the roadway descends from the mound onto the viaduct, the alignment spans over the leachate collection trench and cut-off wall, requiring that one end of the span be placed within the landfill. For the Two-Lane Park Road Alternative, the width of the end pier and mechanically stabilized earth wall are less than that of the Four-Lane proposal.

- *Environmental Impacts.* Both the four-lane proposal and this two-lane alternative would impact freshwater wetlands in the viaduct segment. Under this alternative, the freshwater wetland impacts for the Two-Lane Park Road Alternative total approximately 0.70 acres. This two-lane alternative would therefore reduce the wetland impacts as compared to the four-lane proposal which would impact about 1.1 acres. The impact calculations correspond to the maximum amount of potential permanent footprint impacts associated with a viaduct. In the four-lane proposal and this alternative, the viaduct roadway design option would have the opportunity to reduce the extent of actual wetland resource impacts in several ways. The open areas under the viaduct and the hydrologic connectivity provided for the wetlands both north and south of the alignment are advantages of the viaduct option. The affected area is dominated by common reed (*Phragmites communis*), which would be replaced by native freshwater marsh plant communities. Under both the four-lane proposal and this alternative, new stormwater management controls are necessary in road segment.
- *Park Design Conflicts.* Both the proposed Four-Lane proposal and the Two-Lane Park Road Alternative for the Forest Hill Road connection provide a short and direct route to the Loop Program areas. Views from the roadway on the viaduct and on the section across the landfill would be of significant park features. A viaduct creates a relationship between the driver and the creek while reducing impact on the wetland area. The slim roadway leaves more land for park use and brings the park closer to travelers.

WEST LOOP PARK ROAD/SIGNATURE BRIDGE (2036)

By 2026, the Fresh Kills Park would feature an appealing iconic bridge across the Fresh Kills as the main component of West Loop Road. The bridge would link the North and South Park Roads.

- *Geometry.* In this segment, the roadway horizontal curvature is very similar to that of the four-lane proposal, with a slight improvement in radius at the north end (to 325 feet). The profile, also similar.
- *Landfill Conflicts.* On the south side of the Fresh Kills, the West Loop Park Road traverses land presently occupied by DSNY landfill management and maintenance facilities (part of Plant 1). However those facilities are scheduled for future abandonment and are not expected to conflict with the park's implementation. In the same area, like the four-lane proposal, the alignment passes over a water line, a landfill gas transmission main, and an underground electrical line; however neither alternative has and conflicts with major landfill infrastructure.
- *Environmental Impacts.* Under this alternative, the tidal wetland impacts for the Two-Lane Park Road Alternative totals approximately 1.06 acres—0.11 acres of NYSDEC mapped tidal wetlands and approximately 0.95 acres of regulated tidal open water both direct and indirect impacts such as shadows. This is less than the approximately 3 acres under the four-lane proposal. As with the four-lane proposal, impacts of this construction in and over the water could be mitigated by tidal wetlands at other locations in the park, although the extent of the mitigation would less than under the four-lane proposal. As with the four-lane proposal, depending on its design, this new bridge would require new piles into Fresh Kills along with the decking and coverage of the proposed bridge. Otherwise, like the four-lane proposal, the Two-Lane Park Road Alternative has minimal environmental impact elsewhere as it occupies more or less the alignment of existing DSNY service roads in this segment.
- *Park Design Conflicts.* A two-lane West Loop Road and signature bridge would serve the purposes described under the Four-Lane Alternative—iconic marker, gateway to the largest concentration of destination programs, hinge between park sectors, architectural feature with unique vistas of the water—with less impact on the waterway.

RICHMOND HILL ROAD CONNECTION (2036)

Like the Four-Lane proposal, the Two-Lane Park Road Alternative follows a similar alignment in as the Four-Lane proposal in connecting the East Loop Park Road to Richmond Hill Road over the Yukon saddle and through the basins east of Landfill Section 6/7. However, it differs from the four-lane proposal in its impacts on freshwater wetlands.

- *Geometry.* The Two-Lane Park Road Alternative exceeds the design criteria, except at the horizontal curve approaching the Richmond Avenue intersection, where a curve of a 300 foot radius is provided. Here, justification for retention of the non-standard horizontal curve is the same as for the Four-Lane proposal.

The two lane alignment differs in the northern segment of the road from the four-lane proposal in that it allows for minimal impacts to the stream outlets from Basin B1 to the south. The alignment passes between the garage and the stream. Since the desired profile lies approximately ± 10 feet below the elevation of the parking lot and ± 10 feet above the elevation of the stream, a retaining wall is required on each side of the roadway along that

stretch of roadway, which allows the stream to be retained (see also the discussion under “Environmental” below).

At Richmond Avenue, the Two-Lane Park Road Alternative incorporates an eastbound to northbound left turn bay, a through lane and combined through/right turn lane at the eastbound approach to the intersection. The narrower roadway adds some flexibility to the eastbound approach as compared to the Four-Lane proposal, allowing for the approach angle and shoulder widths to be adjusted during detailed design to achieve the most favorable overall geometric balance.

- *Landfill Conflicts.* As with the Four-Lane proposal, the alignment under the proposed Two-Lane Alternative passes over the landfill along the Yukon saddle segment, in a manner similar to the Four-Lane proposal. Some of the specific differences between the two-lane park road and the four proposals with respect to landfill infrastructure are described below.

In both the Four-Lane proposal and this Two-Lane Alternative, the design must account for the unusual roadbed conditions, as well as the road’s influence on continuing landfill post-closure operations. In general, the roadway foundation design and analysis of landfill related impacts are similar to those described along the Forest Hill Road segment described above.

Among the affected elements along the Yukon saddle are two landfill gas collection laterals, crossing of landfill gas collection headers, covering of a leachate stone trench and a water line. Culverts would also be introduced to maintain drainage conveyance patterns.

As it descends from the landfill section, the alignment spans over the leachate collection trench and cutoff wall. This requires that one end of the span be placed within the landfill, similar to the crossing along the Forest Hill Road connection.

In both the Four-Lane proposal and the two-lane alternative, as the road traverses Basin B1, its embankment severs the southern portion of the southern end of the basin, requiring a culvert beneath the embankment to maintain its hydraulic function. Similarly, a pair of multi-barrel culverts is proposed to maintain the hydraulic connection at the north end of Basin B1. In between, the alignment takes up the space of an existing gravel access road leading to groundwater and landfill gas monitoring wells. Protected pullouts are to be provided at each monitoring well. The landfill gas interceptor venting system is also affected along this segment of roadway.

In the northern segment of the road, as with the four-lane proposal, a portion of the Two-Lane Park Road Alternative alignment overlaps the cutoff wall. Here, protective slabs are proposed to shield the cut-off wall from the influence of roadway loads.

Both the Four-Lane proposal and this Two-Lane Park Road Alternative require filling a portion of Basin B1. However, the estimated encroachments into Basin B1 and the wetlands are each less than that of the Four-Lane proposal due to the reduced road width.

- *Environmental Impacts.* The Two-Lane Park Road Alternative impacts approximately 3.23 acres of freshwater wetlands. The Four-Lane proposal would impact 4.3. Both the Four-Lane proposal and this alternative roadway would be contained within retaining walls in the northern segment of the road, preventing encroachment on the adjacent wetland stream. Further south, the road is able to fit almost entirely on an existing DSNY service road adjacent to existing wetlands. The loss of freshwater wetlands landscape in this area would be mitigated elsewhere on site. Several culverts would also be required under the road to convey water between the wetlands along this stretch of the road alignment.

- *Park Design Issues.* Under both the Four-Lane proposal and this alternative, the Richmond Hill Road connection would serve as the northeastern gateway into the park from the local neighborhoods. .

TRAFFIC OPERATIONS

Overall, traffic levels within the park would be moderate to low, at less than half the capacity of the Two-Lane Park Road Alternative on all park roads, and below those that can be effectively handled by signalized intersections within the park, or by the roundabout proposed under Option 2 for East Loop Road. Thus, as with the four-lane proposal, normal traffic operations on the Two-Lane Park Road Alternative are expected to be satisfactory.

COST

Preliminary costs have been developed for the proposed park roads and improvements to the West Shore Expressway. The costs of the two-lane park road alternative is about 20 percent less than the cost of the four-lane road proposal. The cost of the park roads under the Two-Lane Park Road Alternative is estimated at approximately \$179 million (in 2016 dollars) with an additional \$58 million cost for the West Shore Expressway service road and ramp improvements which yields a total estimated park road cost of \$237 million. The cost of the park roads under the four-lane proposal is estimated at approximately \$242 million (in 2016 dollars) with an additional \$58 million cost for the West Shore Expressway access and ramp improvements which yields an estimated total road system cost of \$300 million.

A significant portion of this cost, \$34 million, is attributed to the proposed viaduct along the Forest Hill Road connection. A combination of embankment and strategically placed structures could result in acceptable impact on the wetlands and substantial cost savings. This potential is being explored in the preliminary design phase.

SUMMARY CONCLUSIONS

Provided below is a summary of the comparison of this Two-Lane Park Road Alternative and the Four-Lane design examined in this GEIS. This summary comparison is made with respect to impacts on the landfill, the environment, the park, and traffic operations.

LANDFILL IMPACTS

With regard to the landfill closure cover system, the horizontal extent of the road embankments under this alternative would be greater under the Four-Lane design than this Two-Lane Alternative, and the wider embankments would result in settlement over a larger area. The wider embankments would also apply more weight to the landfill cover system, waste, and underlying soils, which could result in a lower degree of stability and increased stress on the closure system's geomembrane layer.

Both alternatives cross the leachate management system four times as they traverse Landfill Section 6/7 and both alternatives encroach on the stormwater basin at the north end of the Richmond Hill Road Connection in 2036. However, the Four-Lane design affects an additional length of cutoff wall and leachate collection trench at the north end of the Richmond Hill Road Connection. This Two-Lane Park Road Alternative requires the least extensive protective measures due to its narrower footprint and would also require a smaller bridge, with a smaller

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pier penetrating the waste, at the two grade-separated leachate system crossings along the east edge of Landfill Section 6/7.

Impacts on the landfill gas management system are on the whole relatively minor, but are slightly greater for the Four-Lane design as compared with the Two-Lane Park Road Alternative. Similarly, both require adjustments to the stormwater management system to accommodate the loss of capacity in basins B1, C2, F, and Q, but the differences are pronounced only at Basin B1 where the Four-Lane Design intrudes more extensively. There are no significant differences among the alternatives in terms of impacts to the environmental monitoring system.

ENVIRONMENTAL IMPACTS

All of the proposed roadway alignments encroach on both regulated and unregulated freshwater and tidal wetlands. The entire eastern edge of the site is bounded by wetlands; in order to enter the site from Richmond Avenue, it is necessary to cross them. The design proposes to offset limited landscape losses by creating an extensive system of healthy wetlands, meadows, and woodland.

- The Four-Lane Design impacts approximately 8.56 acres of wetlands.
- The Two-Lane Alternative impacts approximately 5.55 acres of wetlands.

PARK IMPACTS

All of the alternatives provide access to park features and scenic views of park natural features. The Two-Lane Alternative succeeds to a greater degree in limiting the visual and physical intrusion of the road in the landscape. In so doing, the two-lane road is more consistent with park design intentions to provide access to the huge site and its features, while prioritizing bike, pedestrian, and boater experience over cars. In addition, the two-lane road affords opportunities for a greater degree of grade separation between pedestrian/bicycle paths and the roads, as well as providing more room on side slopes for a landscape corridor with native plantings and beneficial stormwater management functions.

Given that traffic volumes do not warrant a wider roadway, there is no advantage to either the Four-Lane design from a park perspective, and given the intention to limit the physical presence of roadways and interference with wetlands, the Four-Lane Design is less desirable from a park perspective.

TRAFFIC OPERATIONS

Traffic Operations on the Proposed Park Roads

The analyses indicate that the projected traffic levels within the park would be low on all park roads, and well within the capacity of a two-lane road. Therefore, normal traffic operations are expected to be acceptable for both the four-lane design and this Two-Lane Park Road Alternative. The Four-Lane design, however, does provide spare capacity on all legs of the primary park road network, which would provide added flexibility in dealing with incidents, major park venue events, and roadway maintenance.

Traffic Operations Outside the Proposed Park

The traffic analysis shows that the park roads would have similar impacts on functionality of the surrounding street network. The traffic analyses indicate that the Four-Lane design provides no greater relief to local traffic congestion than the Two-Lane Alternative.

COSTS

Internal Park Roads

The estimated costs in 2016 dollars of the proposed roads within the park (exclusive of the Signature Bridge and exclusive of the connections to the West Shore Expressway) are \$243 million for the Four-Lane design and \$179 million for the Two-Lane Alternative. In other words, the Four-Lane design costs \$64 million, or 36 percent, more than the Two-Lane Alternative.

West Shore Expressway Access Improvements

The West Shore Expressway access improvements are \$58 million regardless of which park road alternative is selected for implementation.

Total Costs

The total costs, including the proposed park roads and connections to the West Shore Expressway (but exclusive of the Signature Bridge) are \$301 million for the Four-Lane design and \$237 million for the Two-Lane Alternative.

D. ALTERNATIVE—RICHMOND HILL ROAD CONNECTION (WEST OF LANDFILL SECTION 6/7)¹

INTRODUCTION

This alternative examines the potential impacts of a roadway alignment for the Richmond Hill Road Connection that extends around the west side of Landfill Section 6/7 rather than passing over the Landfill via the “Yukon Saddle” and heading north along Richmond Avenue berm and crossing the stormwater basins and wetlands to reach the intersection of Richmond Hill Road at Richmond Avenue. Figure 1-12 in Chapter 1, “Project Description,” shows the general alignment of this proposed alternative. As described in greater detail below, three specific corridors were considered along this alignment: 1) a placement off the landfill (outside the solid waste management unit area boundary); 2) a placement on the existing landfill service road; and 3) a placement up the higher elevation of the landfill. As described below, this Alternative Road Alignment would have impacts similar to the proposed project in many respects, including traffic conditions at this intersection of Richmond Hill Road at Richmond Avenue, which is a long-term proposal for the project and is in the 2036 analysis year. However, there are specific differences with respect to road geometry, landfill conflicts, environmental impacts, and park conflicts that are described below. A more detailed description follows.

¹ This alternative is based on the “Conceptual Alternatives Road Report,” Arup et al., September, 2007.

OVERVIEW OF ENVIRONMENTAL IMPACTS

Like the proposed project, under this Alternative Road Alignment it is assumed that the project site would developed as a park with proposed access roads. The benefits expected to result from the proposed project—including the creation of a 2,163-acre regional park and public access to the waterfront—would also be realized under this alternative. Neither the proposed project or the alternatives would have an impact on socioeconomic conditions or community facilities. Both would provide significant open space benefits as well as benefits for urban design and visual resources. Neither would have shadow impacts or impacts on historic architectural resources. Both have the potential to impact archaeological resources, which would have to be addressed as the project designs are advanced in order to determine if specific areas of archaeological impact could occur and if any field research is necessary. Neither significantly adversely impact neighborhood character. Hazardous materials impacts would be similar, although a somewhat greater intensity of construction would occur with the proposed project as compared to the Two-Lane Park Road Alternative. This additional construction is not expected to greatly affect the project’s need to comply with all applicable City, state, and federal requirements to eliminate the potential for any impacts from hazardous materials, including on-site testing of soils, as necessary.

Both would be generally consistent with New York City waterfront revitalization program policies. Most importantly, the development of a public park on the project site would be consistent with the borough and City goals for revitalizing and providing public access in the coastal zone. Under both the four-lane proposal and this alternative, the increased demands on solid waste and sanitation services would be similar and neither this alternative or the proposed project would result in increases to the degree that there would be significant adverse impacts on these services. Likewise, the increased demands on energy systems would be smaller than those under the proposed project, but neither this alternative or the proposed project would cause significant adverse impacts on utilities. While a greater intensity of construction would occur with the proposed project as compared with this alternative, as it relates to the roads, like the proposed project this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to minimize any public health impacts. In addition, other requirements of the proposed project with respect to public health protections would also be provided to protect public health. Traffic volumes would be the same, thus the traffic impacts would be similar, as would the impacts on air and noise conditions. Impacts on transit and pedestrians would also be similar. With the proposed project, there would be no unavoidable adverse impacts. All impacts of the proposed project would be avoided or mitigated.

Where the proposed project and this alternative differ is primarily in the areas of road design and engineering, conflicts with landfill systems, natural resources, and park design. The differences between the proposed alignment along the eastern corridor for the Richmond Hill Road Connection and this alternative are described in greater detail below.

DESCRIPTION OF ALTERNATIVES AND IMPACTS OF THREE ALIGNMENT CORRIDORS WEST OF LANDFILL SECTION 6/7

An assessment of the major impacts related to three alternative roadway corridors under this alternative follows. These alternative alignments include off-landfill, on landfill service road, and up landfill slope.

OFF-LANDFILL PLACEMENT

The off-landfill alignment avoids significant interaction with the landfill infrastructure. In developing the off-landfill option the roadway was placed outside and as near the landfill cutoff wall as possible, at an elevation above the 100-year flood level, with conceptual allowances for drainage. In the western corridor, an off-landfill road would have to be constructed on a berm in the wetlands or on structure, as there is only a narrow strip of land between the landfill perimeter and open water. Much of this section of Main Creek includes tidal wetlands that have been mapped by NYSDEC, that have been mapped as part of the National Wetlands Inventory, requiring a U.S. Army Corps of Engineers (ACOE) permit, and designated as significant coastal fish and wildlife landscape by the New York State Department of State (NYSDOS). All three agencies would be involved in the review of any impacts to these designated areas, NYSDEC and ACOE in a permitting capacity. This alignment would be costly to construct as either a two-lane or four-lane Park Road and would have the following impacts:

- It is estimated that the alignment could impact up to 14 acres of land area below the 10-foot contour line as currently surveyed. This would include activities such as filling and grading in both tidal wetlands and tidal wetland adjacent areas, interrupting mapped high marsh, intertidal marsh, and some formerly connected wetlands linked hydrologically and ecologically with the William T. Davis Wildlife Refuge to the North.
- A portion of the roadway would be constructed within existing tidal wetland areas, which would require review by NYSDOS and permitting by NYSDEC and ACOE. Assuming about half of this area (7 acres) is tidal wetlands, mitigation under the Tidal Wetlands Act and State Environmental Quality Review (SEQR) may require 24 to 32 acres of new or substantially improved tidal wetlands. Under the two-lane alignment this potential impact reduces to 11 acres of impacted tidal wetlands adjacent area (estimated at 5 to 6 acres of tidal wetlands), or an estimated mitigation area of 15 to 24 acres. In either case, from a natural resource perspective, an alignment with less impact on tidal wetlands would be much preferred.
- If there are other viable alternatives without substantial wetland impacts, it may be difficult or impossible to get permits for this alignment.
- Soft soils within the tidal wetland area would likely not provide an adequate foundation for embankment roadway construction without engineering modifications such as overexcavation and replacement, and sheet pile bulkheads.
- A significant volume of fill would need to be imported to achieve a finished roadway elevation above the 100-year flood elevation; alternatively, construction of the roadway on a pile-supported viaduct would be costly.
- Placing the roadway on water's edge restricts park visitors' contact with Main Creek. Without massive wetland filling in addition to that for the roadway, a waterside pedestrian/bike path would not be possible in this scenario.
- No creek-side space would be available for a landscape buffer that would provide landscape, filter road runoff to reduce wetland impacts, and reduce the visual prominence and noise of the road.

The impacts associated with the two-lane alternative only differ from those of the four-lane alternative in degree. The roadway would be about two-thirds and the base of the embankment approximately three-fourths as wide, but would principally result in the same impacts.

ON-SERVICE ROAD PLACEMENT

This road location on the landfill section slope was selected to alleviate a significant portion of the shoreline and wetland impacts cited above, as well as avoiding major impacts on the landfill cover, and to provide a strong, compacted road base that minimizes the depth of municipal solid waste under the road. In developing this alternative, the outside edge of the proposed roadway was designed to generally coincide with the outside edge of the service road, to avoid placing the leachate system chambers, manholes, vents, and their frequently used access covers within the pavement area. Given that the existing perimeter service road is about 20 feet wide, and typically fitted between sloping sides, both the four-lane and two-lane versions, which are approximately 60 and 40 feet wide, extend well outside the existing paved footprint and its plateau. The greater width is obtained by raising the new road surface to where its inside edge meets the side of the landfill without cutting into the landfill cover, which would necessitate reshaping extensive portions of the mound slope.

The consequence of raising the roadway profile is that this placement would still intrude into the environmentally sensitive creek shore and would cause disruption to landfill infrastructure and long-term operations as follows:

- To avoid cutting into the landfill cover, up to 10 feet of fill would need to be placed above the existing service road surface to achieve a finished roadway that integrates properly with the existing slope, with the necessary stormwater management provisions.
- Existing leachate collection and pumping station enclosures would need to be vertically extended to meet the final grade elevations and traffic bearing covers installed.
- The top of the leachate cutoff wall would need to be protected and hardened to alleviate the load from the overlying roadway fill.
- Should repairs to the leachate trench and cutoff wall become necessary, the high overlaying embankment will severely hamper access. In addition, such interventions would result in disruption and potential closure of the Park Road.
- The existing service road would be eliminated and landfill maintenance vehicles and activities would have to share the road with park users and commuters. Even with the addition of auxiliary pavement, the slower movements and stoppages of maintenance vehicles are likely to cause friction with faster vehicles and safety concerns. A separated maintenance road is not feasible, as it would not be able to access the critical infrastructure lying in the area of the cut-off wall.
- Auxiliary accommodations for parking and filling of over-the-road tanker trucks used to collect landfill gas condensate would need to be incorporated into the design. Special precautions for protecting landfill maintenance personnel from roadway traffic would need to be implemented during periodic maintenance of the leachate pumps or electrical systems.
- Placing the roadway on the service road still results in intrusion into the wetland buffer and diminishes the opportunity for and appeal of a waterside pedestrian/bike path.
- Minimal space would be available for the landscape buffer and filtration of road runoff.

Again, the impacts associated with the two-lane alternative differ from those of the four-lane alternative in degree. The narrower roadway would not require as high an embankment over the existing service road, reaching a height of 6 feet above the leachate trench, nor extend as far laterally. Nonetheless, the list of issues would read much the same.

UP-LANDFILL PLACEMENT

In this alignment, the road is placed higher up on the landfill sections west slope so that the road embankment does not impinge on critical perimeter landfill infrastructure features. Since the slope of the roadway embankment and that of the Landfill Section 6/9 are similar (at approximately 33 percent), development of useful alignment, profile, and cross sections required the testing of several side slope locations. The placement depicted was chosen because it rests on a shelf that is wide enough not to cause the new roadway embankment to chase the downhill side with fill onto the service road, nor to cut into the uphill side up to the next plateau. These constraints were considered important because this part of the landfill will already have met final closure requirements by the time of road construction.

While this placement avoids impacts on the Main Creek shore, the service road, and the leachate collection/cutoff wall system, it places the road far up on the Landfill Section, with projected elevations near elevation 90, a deeper waste strata of the landfill, and with the potential to have the following effects on the environment and the landfill systems:

- Placement of the roadway at this elevation may reduce the short-term slope stability factor of safety below the generally recommended value of 1.5.
- Waste deposits could be expected to settle several feet due to mechanical compression and future decomposition, and require additional up front capital cost to mitigate impacts.
- Foundation improvement techniques would be necessary to stabilize this waste prior to road construction. Even with preventive measures, more variability in settlement following foundation improvement could be expected due to the inability to reach and treat lower strata.
- The stabilization treatments would likely require a significant amount of energy or resources (i.e. more compaction effort, greater surcharge thickness, deeper drilling for stone columns) in attempting to better improve the long-term performance of material lower in the profile.
- Areas of the east mound adjacent to the western corridor are scheduled for closure construction in 2007 and 2008, ahead of roadway construction. To ensure the integrity and performance of the landfill cover system, areas already experiencing landfill closure construction would need to be deconstructed prior to foundation improvement and reconstructed as a part of the roadway.
- The deconstruction and reconstruction of the cover system would require that an area as wide as the roadway grading, plus an additional 25 feet on each side of the grading limits, be cleared of cover soils, and that the geomembrane be cut at a location approximately 5 to 10 feet inside of the area that has been uncovered to apply roadway foundation improvements and modify the gas system. The geomembrane's cut edge would need to be cleaned and protected during roadway foundation improvement and base grading.

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- The roadway position on the landfill would conflict with landfill gas wells and with header and lateral collection lines. Modifications to the gas system features along the western slope of east mound would be necessary to accommodate roadway construction.
- After settlement or compression of the waste, soil backfill and regrading will be needed to restore surface integrity. In reconstructing the cover, the gas vent layer (under membrane composite) will be replaced by overlapping the new composite with the existing material, the new membrane must be placed and welded, tested, certified, and accepted by NYSDEC. Similarly, the drainage layer geotextile or composite (above the membrane) will be replaced by overlapping with the existing material and the barrier solids (roadway subbase material) placed. Reconstruction of the geomembrane cover welds will likely be made using extrusion welds, which are more difficult to construct and test for continuity than fusion welds typically made along the edges of new geomembrane panels.

WEST ALIGNMENT SUMMARY

All three west alignments described above were proven to have significant impacts, to be problematic and undesirable in comparison to eastern alignment proposed in this GEIS for the following reasons:

- The on-landfill alignment pushes the road well up Landfill Section 6/7, interfering with views from the North Park and William T. Davis Wildlife Refuge, a condition that runs counter to the park goal of leaving this northern section pristine and natural.
- The 9- to 14-foot rise of the landfill service road scenario above the existing perimeter features significantly impacts upon landfill infrastructure and would compromise DSNY landfill maintenance and operations. The on-service road scenario proves to be the least desirable alignment in all three corridors, as it consistently conflicts with critical landfill infrastructure and seriously compromises maintenance and operation requirements.
- The on-landfill alignment rises to approximately elevation 90, traversing some of the thickest, most unconsolidated layers of waste that are presently being capped. This will result in significant initial and long-term settlement that will not adequately respond to preloading and other foundation improvement measures. Initial construction and the large initial settlement will require cap removal and reconstruction. Differential settlement would continue in the longer term, resulting in undesirable levels of degradation for both the road and the landfill, requiring excessive intervention.
- The off landfill alignment would result in significant impacts on tidal wetlands and natural resources of Main Creek and William T. Davis Wildlife Refuge as well as views and experiences from North Park and William T. Davis Wildlife Refuge.

E. LESSER IMPACT ALTERNATIVE

DESCRIPTION

This alternative examines the potential impacts of less intensive programming for the park and a reduced roadway network. The park would not include any recreational areas, amenities, cultural/educational facilities, banquet halls, restaurants, etc., and would consist of completing closure of the landfill and subsequently landscaping the project site. Under the Lesser Impact Alternative, the proposed roads would also not be constructed. This analysis compares

conditions under the Lesser Impact Alternative to conditions with the proposed project through 2036.

LAND USE, ZONING AND PUBLIC POLICY

Under the Lesser Impact Alternative, it is assumed that the entirety of the Fresh Kills project site would be mapped as parkland and landscaped, however, no recreational areas or public amenities would be constructed on the site. This alternative would provide some public access to the site along footpaths, but there would be no roads constructed as part of the project.

The benefits to the area expected to result from the proposed project—including the creation of a 2,163-acre regional park with a variety of active recreational areas and other amenities, including significant public access to the waterfront—would not be realized under this alternative, however, it would not provide the goals of providing waterfront public access or reuse of a underutilized waterfront parcel for public access, as well as recreational and cultural amenities.

SOCIOECONOMIC CONDITIONS

As stated above, the project site would be landscaped and would include small footpaths, however, no recreational areas, public amenities, or new roads would be constructed on the site. After closure of the landfill, a small number of employees would remain to oversee the maintenance and operations of the closed landfill, however, the number of parks employees on site to maintain the park under this alternative would be minimal. Neither the proposed project nor the Lesser Impact Alternative would displace populations, employees, or businesses. However, the project's goals of creating a park with a variety of recreational uses to complement both the existing residential neighborhoods surrounding the project site and the region as a whole would not be met under the Lesser Impact Alternative, and there would be fewer new jobs created than under the proposed project.

COMMUNITY FACILITIES

Neither the Lesser Impact Alternative, or the proposed project would have any significant adverse impacts on community facilities.

OPEN SPACE

The park that would result from the Lesser Impact Alternative would not include any recreational facilities or public amenities. While the Lesser Impact Alternative would still improve passive open space ratios for the study area population due to the mapping, open space ratios would not see the dramatic improvement benefits that would occur under the future with the proposed project.

SHADOWS

Neither this alternative nor the proposed project would have an shadow impacts.

HISTORIC RESOURCES

Under the Lesser Impact Alternative, it is assumed that the project site would be landscaped, however, since no recreational uses, public amenities, or roads would be constructed, it is expected that no potential impacts to archaeological resources would occur. With the proposed

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project, it is recommended that individual construction projects be reviewed by an archaeologist to determine if the project could impact locations that were identified in the Phase 1A archaeological documentary study as possessing moderate, moderate to high, or high sensitivity for pre-contact or historic-period archaeological resources.

With respect to architectural resources, under the Lesser Impact Alternative, since it is assumed that only landscaping would occur on the project site, there would be no significant adverse impacts to architectural resources. Similarly, no significant adverse impacts are expected in the future with the proposed project. One architectural resource, the Sleight Family Cemetery (a.k.a. Blazing Star Burial Ground) New York City Landmark (NYCL) is located in the project site; however, no direct or indirect impacts to this resource are expected to result from the Lesser Impact Alternative or from the proposed project, and no construction activities are currently planned within 90 feet of this resource in either scenario.

URBAN DESIGN AND VISUAL RESOURCES

Under the Lesser Impact Alternative, it is assumed that many of the visual enhancements associated with the construction of the proposed park would be foregone. Although the site would be landscaped, the active recreational uses and public amenities would not be constructed.

NEIGHBORHOOD CHARACTER

The Lesser Impact Alternative would not provide all of the benefits to neighborhood character associated with the recreational uses and public amenities planned under the proposed project, nor would it have either the positive or negative impacts on traffic circulation that occur under the proposed project.

NATURAL RESOURCES

The Lesser Impact Alternative would avoid the impacts to freshwater and tidal wetlands that would occur as a result of the roads and marine infrastructure that are part of the proposed project. Thus the freshwater and wetland mitigation would not be necessary. However, it would also not include the overall benefits of the project with respect to freshwater and tidal wetland enhancements.

HAZARDOUS MATERIALS

In the Lesser Impact Alternative, it is assumed that landfill closure would be completed in accordance with approved DSNY closure plans with oversight by the New York State Department of Environmental Conservation (NYSDEC). It is expected that closure construction at Landfill Sections 6/7 and 1/9 will be completed by 2016. Without the proposed project, the project site would be landscaped; however, no active recreational uses, public amenities, or roads would be constructed on the site. Overall, in the Lesser Impact Alternative there would be a low potential for disturbance of hazardous materials, but there would likely be less soil cover than would be associated with the future with the proposed project since public access would be limited.

While a greater intensity of construction would occur with the proposed project as compared to the Lesser Impact Alternative, this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to eliminate the potential for any impacts from hazardous materials.

WATERFRONT REVITALIZATION PROGRAM

The Lesser Impact Alternative would be consistent with many of the City coastal zone objectives or waterfront plans for the site; however, it would not provide the same level of public access to the waterfront that would be provided with the proposed project. Thus it would not meet the goals for public access and recreational use of the waterfront on City-owned properties.

In contrast, under the proposed project, the development of a public park with active recreational uses and public amenities on the project site would be fully consistent with the borough and City goals for revitalizing and providing public access in the coastal zone.

INFRASTRUCTURE

Under the Lesser Impact Alternative, increased demands on infrastructure would not occur; however neither this alternative nor the proposed project would cause increases to the degree that there would be significant adverse impacts on these services.

SOLID WASTE AND SANITATION SERVICES

Under the Lesser Impact Alternative, as in the future with the proposed project, it is assumed that the final closure construction of all the landfill sections would be completed by 2016, and by 2036, all landfill sections would be closed and DSNY would continue to operate and manage the Fresh Kills Landfill environmental control systems, along with implementation of the monitoring and maintenance programs.

For the project site, the increased demands on solid waste and sanitation services would be less in the Lesser Impact Alternative than under the proposed project, but neither this alternative nor the proposed project would result in increases to the degree that there would be significant adverse impacts on these services.

ENERGY

Under the Lesser Impact Alternative, the increased demands on energy systems would be smaller than those under the proposed project, but neither this alternative nor the proposed project would cause significant adverse impacts on utilities.

TRAFFIC AND PARKING

TRAFFIC

In the Lesser Impact Alternative, traffic and parking demand levels in the study area would increase as a result of general background growth and future developments in the area. However, since the park on the project site under this alternative would have less intense uses than the proposed project, there would be minimal additional traffic introduced to the study area. However, this alternative would also not include the roadway connections to the West Shore Expressway that would relieve local traffic congestion. It is therefore not expected that any traffic impacts would occur under this alternative.

PARKING

Under the Lesser Impact Alternative, no impacts would occur on local off-site parking. Thus, conditions would be similar to the future with the proposed project.

TRANSIT AND PEDESTRIANS

The proposed project would not adversely impact transit and pedestrian conditions. Thus, conditions in the Lesser Impact Alternative would not be significantly different from that under the proposed project. No expanded transit service onto the project site would be necessary.

AIR QUALITY

With respect to mobile sources, no violations of the National Ambient Air Quality Standards (NAAQS) are predicted to occur under either the Lesser Impact Alternative or under the proposed project. In addition, as under the proposed project, the Lesser Impact Alternative would not result in impacts from heating systems.

NOISE

Under the proposed project no impacts would occur at local sensitive receptors. Thus, conditions under this Lesser Impact Alternative would be similar to the proposed project.

CONSTRUCTION

Since the Lesser Impact Alternative would not involve the construction of active recreational uses, public amenities, or new roads on the site, it would not generate as much construction activity or disruption as the proposed project. The Lesser Impact Alternative would have less construction-related noise and traffic than the proposed project. However, neither this alternative nor the proposed project would result in significant adverse impacts on air quality, noise, traffic, or transit during construction.

PUBLIC HEALTH

In the Lesser Impact Alternative, it is assumed that landfill closure will be completed in accordance with approved DSNY closure plans with oversight by NYSDEC. It is expected that closure construction at Landfill Sections 6/7 and 1/9 will be completed by 2016. The leachate collection and containment system and landfill gas management system will continue to operate after landfill closure as required by NYSDEC.

While a greater intensity of construction would occur with the proposed project as compared to the Lesser Impact Alternative, this additional construction would be closely monitored and would occur in compliance with all applicable state and federal requirements to minimize any impact from hazardous materials. The proposed project would also include all the necessary measures to avoid impacts to landfill infrastructure, environmental monitoring and maintenance systems, and would provide the other measures necessary to avoid impacts to park users and the general public relative to public health. Therefore, neither this alternative nor the proposed project would impact public health.

MITIGATION

Under the Lesser Impact Alternative, there would not be the significant impacts of the proposed project (e.g., traffic, wetlands) that require mitigation. However, under the proposed project all impacts can be mitigated while meeting the goals of this project.

UNAVOIDABLE ADVERSE IMPACTS

Unlike the proposed project, the Lesser Impact Alternative would not have any unavoidable adverse impacts.

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