

5. Description, Evaluation and Rationale for “Alternative Methods”

This chapter provides the description, evaluation and rationale for the “Alternative Methods”. As previously noted, “Alternative Methods” are different ways of carrying out the Project. Alternatives were identified and evaluated based on the methodology provided in the following sections and outlined in the ToR. The “Alternative Methods” were developed to address the identified existing problems (i.e., risk from erosion, limited waterfront access, low habitat integrity) and create new opportunities or benefits (i.e., access, improved habitat, and reduced risk). Furthermore, the “Alternative Methods” were developed in a manner that is complementary to the existing natural features of the Project Study Area and considered the concerns and input of the local community.

Once developed, the Alternatives were then assessed and evaluated based on their ability to achieve the Project Vision and Objectives. Evaluation Criteria and Indicators were used to assess the extent of new opportunities or benefits created and potential resulting negative environmental effects. This reflects the relative advantages and disadvantages of each Alternative. All applicable components of the environment were considered as per the *Ontario EA Act* and are reflected in the Criteria and Indicators. Based on the evaluation, a Preferred Alternative was selected that best meets the overall Project Vision and Objectives.

5.1 Step 1: Consideration of Baseline Environmental and Social Conditions

In **Chapter 3**, a description of the baseline conditions in the Project Area and Project Study Area was prepared which provided contextual information for the development of the Alternatives and their evaluation. This information was used to understand the specific physical, natural and socio-economic conditions that influenced the development of the Alternatives.

5.2 Step 2: Confirm Problems and Opportunities by Shoreline Segment

Considering the baseline conditions (refer to **Chapter 3**) and agency, public and stakeholder input (refer to **Chapter 10**), the Problems and Opportunities for each of the three Project Area Shoreline Segments were confirmed. As previously described in **Section 2.5**, the key problems/opportunities associated with this EA study included:

- Limited Access to and along the Waterfront:
 - ▶ Unsafe, informal access along sandy shorelines;
 - ▶ Vehicle, pedestrian and cyclist conflict on Brimley Road;
 - ▶ Approximately 1,770 m¹ of shoreline access constrained by private ownership and critical infrastructure;

1. Note that all shoreline measurements are based on the curved nature of the shoreline, unless otherwise specified.

- ▶ No access to and along the waterfront for people of limited abilities east of Bluffer's Park Beach;
 - ▶ No formal access to the shoreline east of Doris McCarthy Trail; and,
 - ▶ Opportunities to formalize access points, create continuous waterfront access in public ownership, provide access for all users, and manage conflicts on Brimley Road.
- Erosion and Risk to Public Safety and Property:
 - ▶ Public safety and public infrastructure at risk from erosion within the planning timelines of the Project;
 - ▶ Informal access along sandy shorelines at risk from landslides and other hazards; and,
 - ▶ Opportunities to mitigate risk to public property and infrastructure, and manage risk to users.
 - Habitat Integrity:
 - ▶ Historical human activities have impacted the aquatic habitat within the nearshore;
 - ▶ Ongoing impacts to terrestrial communities of concern due to trampling and fragmentation as a result of informal access; and,
 - ▶ Opportunities to restore and enhance aquatic and terrestrial habitat.

5.3 Step 3: Develop Alternatives by Shoreline Segment

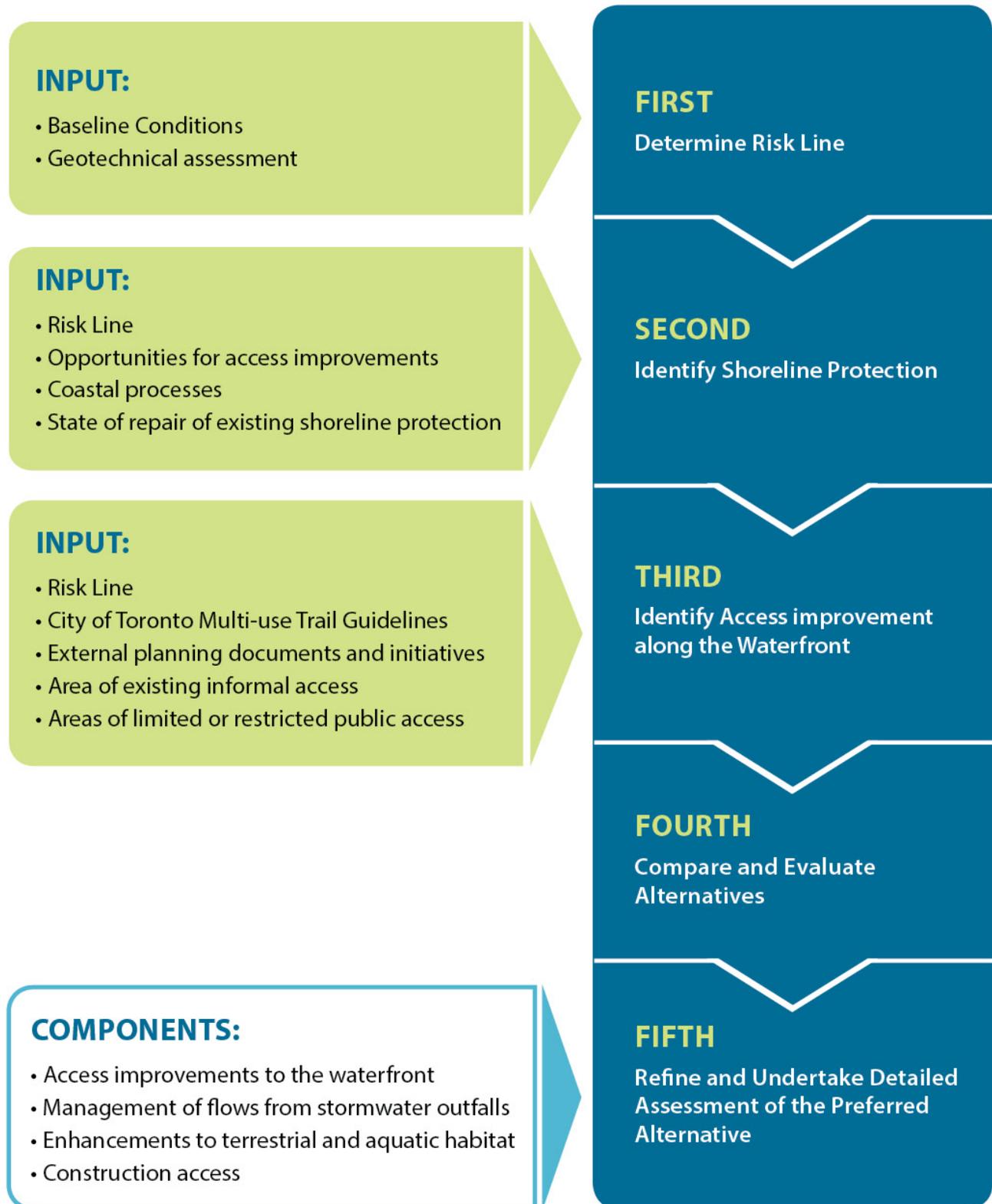
Considering the Project Vision and Objectives, baseline conditions, problems/opportunities, and public and Stakeholder input, separate sets of Project Alternatives were developed for each of the three Project Area Segments: West, Central and East (see previous **Figure 2-1** showing limits of Project Area Segments).

Alternatives were developed as follows (**Figure 5-1**):

FIRST: Determine the Risk Line

The risk line associated with slope crest migration and the resulting talus accumulation was identified at the toe of the Bluffs, and from the crest of slope at the top of the Bluffs for public properties. The risk line identifies a rationally estimated likely extent of talus accumulation, and is provided on the basis of MNRF technical guidelines, geotechnical engineering criteria, observation and professional judgment, which are practical for this land usage and this environment. It identified the line beyond which public safety risks have been adequately mitigated (as is the responsibility of the City of Toronto and the TRCA), but not eliminated. Trail options are to be lakeward of the risk line at the toe of the Bluffs and shoreward of the risk line at the top of the Bluffs.

Figure 5-1: Framework for the Development and Evaluation of Alternatives



SECOND: Identify Shoreline Protection

Shoreline protection options were identified which would accommodate safe public access beyond the risk line and stop toe erosion. Three main options were considered; revetments, headland beaches, and islands. Bridges were also considered as a softer Alternative for short spans only where removal from risk at the toe was required, and there was no risk to public infrastructure along the tablelands. Through coastal modeling, each Alternative was designed to consider potential increases in extreme weather events associated with climate change (more frequent storms, high waves, more intense rainfall), and all Alternatives have advantages and disadvantages in providing protection, access, and improved habitat at a reasonable cost. All Alternatives requiring fill would be constructed of approved fill, rip rap, and armourstone that meets MOECC's *Fill Quality Guide and Good Management Practices for Shore Infilling in Ontario* (2011) guidelines. In addition, existing shoreline protection works were inspected to determine which required repair, retrofit or renewal.

THIRD: Identify Access Improvements along the Waterfront

Access improvements along the waterfront were considered through trail routing. As previously noted, both the City of Toronto Official Plan and TRCA's Living City Policies provide direction that the Waterfront Trail is to be moved to the water's edge and into public ownership, where feasible. Continued growth of the City population and densification of surrounding neighbourhoods will increase demand by users to access the waterfront area. Unmanaged access will continue to degrade important ecological features. Therefore, access must be managed to protect ecological features. As noted above and earlier in this document, the City and TRCA are required to meet the City's Multi-use Trail Guidelines for a primary to high-capacity trail, allow for access by Emergency Services vehicles, and where possible they must meet AODA grade and surface requirements. Therefore, in routing the trail the initial assumptions were that the trail would require a corridor of a maximum width of 8 m, including a paved trail of 3.6 to 4.1 m, with separate marked lanes for pedestrians and cyclists, a slope of not greater than 5%, and a maximum turning radius of 20 m. These design requirements provide for access by Emergency Services vehicles and permit sufficient width to allow for separation between different user groups. These assumptions were only modified if a constraint was encountered that required a reduction to the width, or an increase to the grade. Modifications were also made if achieving these assumptions would result in substantive alterations to the Bluffs through the use of cut and fill. Access improvements that present human safety risks that cannot be reasonably mitigated or managed were not considered further. In addition, the expansion of the rail corridor within the East Segment may constrain the trail connection through this section, and may require the rerouting of the existing Waterfront Trail.

FOURTH: Identify Alternatives for Each Segment to be Evaluated and Compared to Choose the Preferred Alternative

The shoreline protection options and access improvements beyond the risk line were combined into a set of Alternatives for each Segment. Each Alternative was described at a conceptual level of detail and then assessed using Criteria and Indicators which measure how well each Alternative achieves the Project Objectives, and positive and negative net environmental effects, in order to identify a Preferred Alternative. For each Alternative, mitigation related to avoiding sensitive features was applied (see **Table 5-1**). The Alternatives for each Segment were then compared against each other to identify a Preferred Alternative.

FIFTH: Refine and Undertake Detailed Assessment of the Preferred Alternative

A number of opportunities and activities were determined to be the same for all Alternatives, and were described (**Chapter 6**) and assessed (**Chapter 7**) for the Preferred Alternative only. These included:

- ▶ Opportunities to improve access to the waterfront, for both vehicle (Emergency Services and maintenance only) and pedestrian/cycling access;
- ▶ Opportunities to manage stormwater outfalls prior to discharge to Lake Ontario;
- ▶ Opportunities to enhance and manage terrestrial habitat; and,
- ▶ Construction access and construction activities.

The following provides a description of the Alternatives that were identified for the Project. It is noted that while the evaluation is focused on the evaluation of “Alternative Methods”, or designs, the “Do Nothing” Alternative was also considered in this evaluation and is included in the description of Project Alternatives for each section. The advantages and disadvantages of each Alternative are assessed in **Section 5.4**.

5.3.1 West Segment Alternatives

The following presents the Alternatives developed in the West Segment. A total of eight Alternatives plus the “Do Nothing” Alternative were developed. All Alternatives, except the “Do Nothing” Alternative, include the provision of a new water’s edge trail connection between Bluffer’s Park and the Meadowcliffe shoreline section (Central Segment). The Alternatives differ in how they provide this new trail connection.

5.3.1.1 West Segment, Do Nothing (Leave As Is)

The “Do Nothing” Alternative would not result in any significant changes to the shoreline. There would not be safe “water’s edge” public access connecting Bluffer’s Park with the Meadowcliffe shoreline

section. The Cudia Park Bluffs would continue to erode, and without shoreline protection it would remain oversteepened and in a state of active downcutting and slope erosion, until it reaches a stable state and begins to vegetate. The timeline to reach a stable slope state is expected to be in the order of decades. Bluffer's Park Beach would continue to exist in a similar condition as it is today providing recreation opportunities. The City of Toronto would continue with maintenance activities at Bluffer's Park while TRCA will maintain the TRCA/City-owned shoreline works. Regular (at least every two years) dredging of the entrance channel to Bluffer's Park boat basin would also be undertaken. **Figure 5-2** illustrates what the "Do Nothing" Alternative would include.

5.3.1.2 West Segment, Alternative 1: Headland Beach

This Alternative includes the creation of new headlands east of Bluffer's Park at the base of Cudia Park (**Figure 5-3**). As shown in the figures below, a cobblestone beach would be developed between the created headlands. The maximum distance of infill from the shoreline edge into the water would be approximately 115 m. This Alternative would connect the shoreline between Bluffer's Park and Meadowcliffe by extending the shoreline treatment at Meadowcliffe. This Alternative would halt the toe erosion at the base of Cudia Park, but crest migration would continue until a stable slope is reached.

The Alternative would be designed to accommodate the required setback of the risk line from the bluff face as well as a connecting trail along the shoreline of about 650 m in length. The existing Bluffer's Park sand beach would be retained, with the exception of approximately 330 m at the eastern extent.

The headlands/beach would improve aquatic habitat diversity through the addition of the cobble beaches, and increased length of shoreline.

The area of infill required would be approximately 40,000 m².

5.3.1.3 West Segment, Alternative 2A/2B: Bridge (Short Span and Long Span)

This Alternative involves constructing a bridge connection with either short spans (approximately 30 m long) or long spans (approximately 100 m). The bridge would be located along the shoreline between Cudia Park and Meadowcliffe (**Figure 5-4** and **Figure 5-5**). Its maximum distance from the shoreline into the water would be approximately 50 m to accommodate the required risk line setback from the bluff face to facilitate a new trail connection. The bridge length would be approximately 600 m. The bridge would be supported on steel piers surrounded with scour protection, which involves the placement of stone on the lake bottom without breaking the surface. The elevation of the bridge would be approximately **77.5 metres above sea level (mASL)** (about 2.5 m above typical lake level). The bridge would have minimal impact on the existing Bluffer's Park sand beach (approximately 10 m).

Toe erosion at the base of Cudia Park would continue at a marginally lower rate than existing as the bluff begins to self-stabilize, although crest migration would still occur while that process continues. Early stages of stabilization would be reached in 5 to 10 years after the construction of shoreline protection.

Figure 5-2: West Segment, Do Nothing (Leave Shoreline As Is) – Overview



Figure 5-3: West Segment, Alternative 1: Headland Beach – Overview

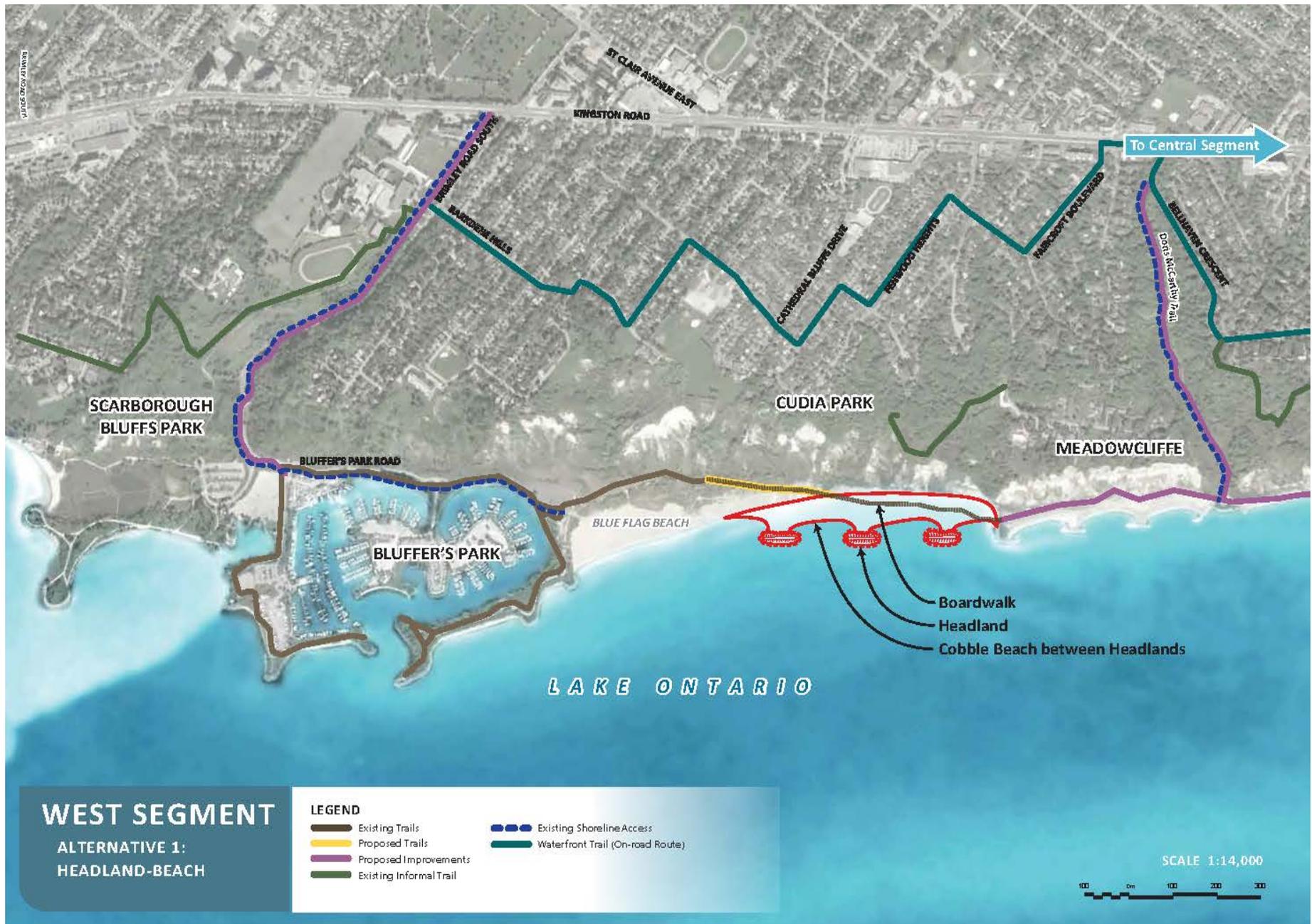


Figure 5-4: West Segment, Alternative 2A: Bridge (Short Span) – Overview

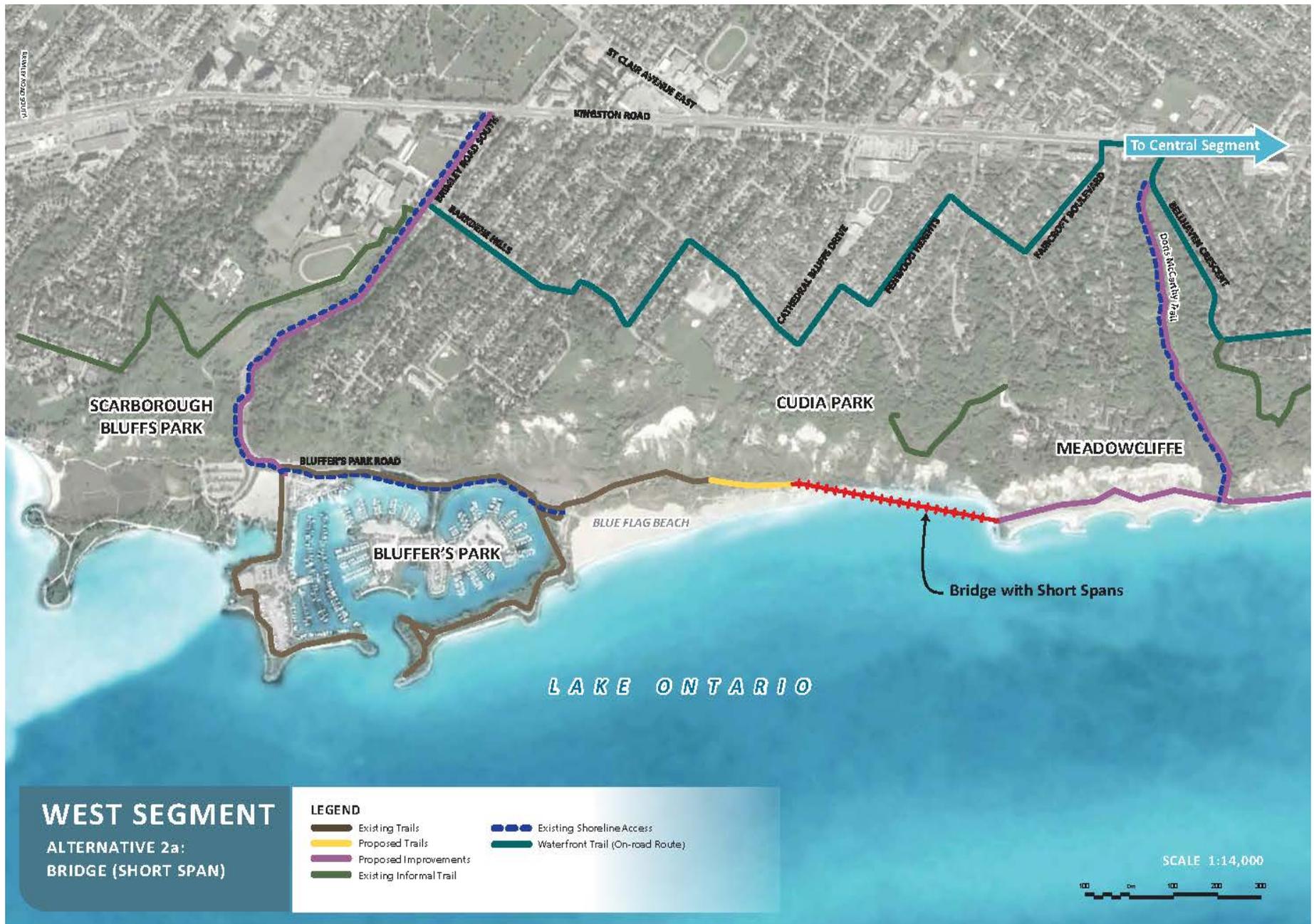
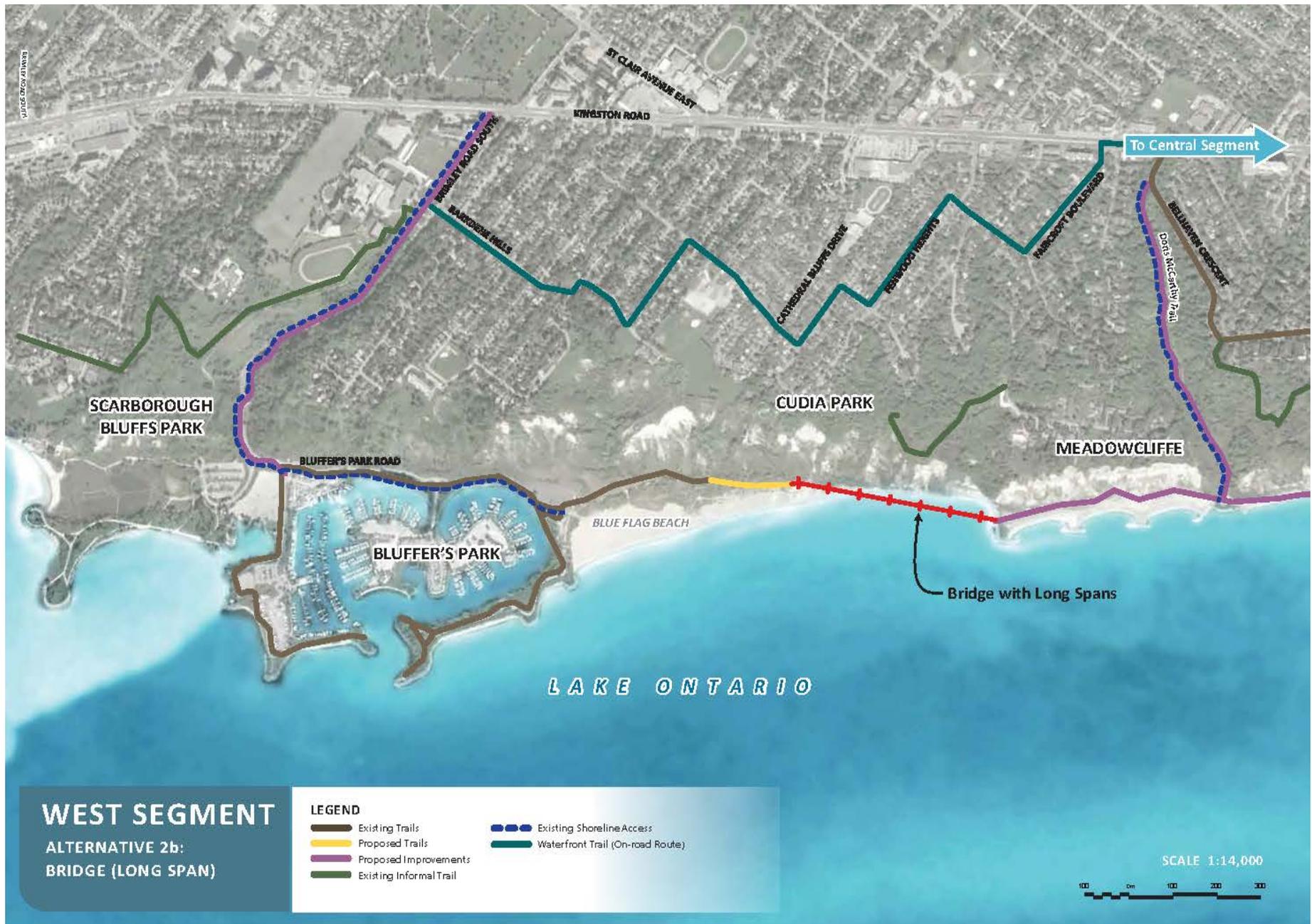


Figure 5-5: West Segment, Alternative 2B: Bridge (Long Span) – Overview



5.3.1.4 West Segment, Alternative 3A/3B: Island-Bridge (Short Span and Long Span)

This Alternative involves an island-bridge connection with short or long spans to connect the created “islands” and provide trail access between Cudia Park and Meadowcliffe (**Figure 5-6**). For the short span island-bridge, the islands would be approximately 50 to 100 m long and the bridges would involve approximate 30 m long spans. It is expected that about five to six islands would be created. Alternative 3B, the long span island-bridge, would involve fewer but longer islands and bridges (**Figure 5-7**). The bridge span lengths to connect the islands are expected to be approximately 100 m and the islands would be about 120 m in length. About three islands would be created.

The structure would have a crest elevation of 79 mASL (about 4 m above typical lake level). The maximum distance of the island-bridge concept from the shoreline into the water would be approximately 125 m and would be located lakeward of the risk line. The bridge sections would be supported on steel piers. The bridge sections would be positioned at a similar height as the islands (79 mASL).

The Alternative would also include ramps on either end for connection with the shoreline, and would have a minimal impact on the existing Bluffer’s Park sand beach (approximately 30 m). It is estimated that the short span island-bridge would require an approximate area of 12,000 m² of infill and the long span island-bridge would require approximately 9,000 m² of infill.

Aquatic habitat enhancement opportunities associated with this Alternative include increased shoreline morphology through a longer, more irregular shoreline, and increased shoreline substrate type diversity through the addition of larger rocky substrate.

Toe erosion at the base of Cudia Park will be mostly eliminated. The bluff would begin to self-stabilize, although crest migration would still occur while that process continues.

5.3.1.5 West Segment, Alternative 4: Causeway

This Alternative involves constructing an armourstone-protected causeway crossing to provide a trail connection between Cudia Park and Meadowcliffe (**Figure 5-8**). The causeway would include ramps on either end for connection to the shoreline trail, and would have a moderate impact on the existing Bluffer’s Park Beach (of approximately 240 m). Its maximum distance from the shoreline into the water would be approximately 120 m and the Alternative would accommodate a trail lakeward of the required risk line setback. The causeway is proposed to be located further away from the shoreline than the bridge Alternatives to allow for the creation of an inner embayment area. The causeway length would be approximately 650 m. The elevation of the causeway would be approximately 79 mASL (about 4 m above typical lake level).

This Alternative would require an area of approximately 15,000 m² of infill. A sloped revetment would be used to reduce wave reflection. This Alternative would also include approximately five 135 m-long, 1.5 m diameter Corrugated Steel Pipe (CSP) culverts to allow for the passage of water between the inner basin and the lake.

Figure 5-6: West Segment, Alternative 3A: Island-Bridge (Short Span) – Overview

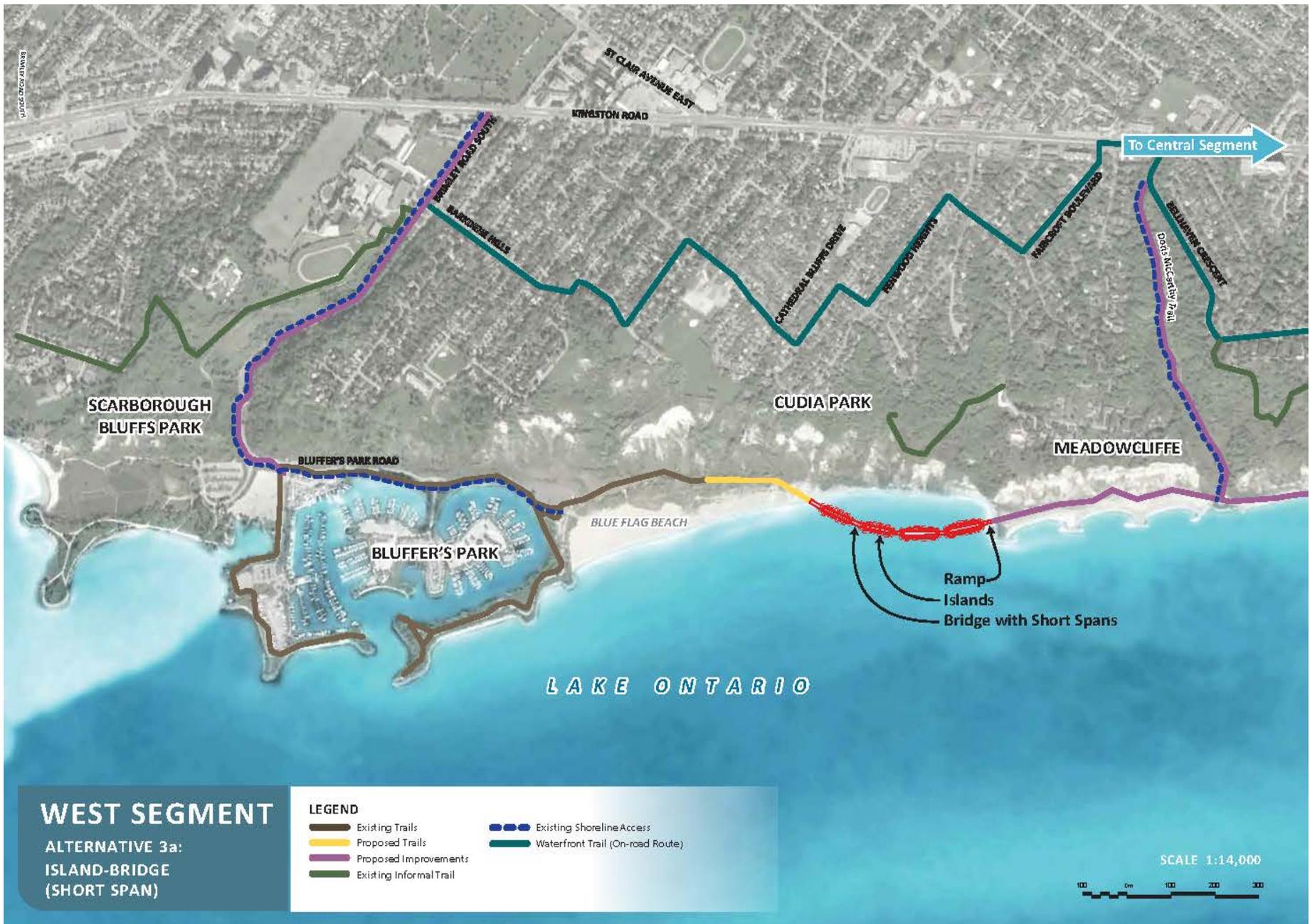


Figure 5-7: West Segment, Alternative 3B: Island-Bridge (Long Span) – Overview

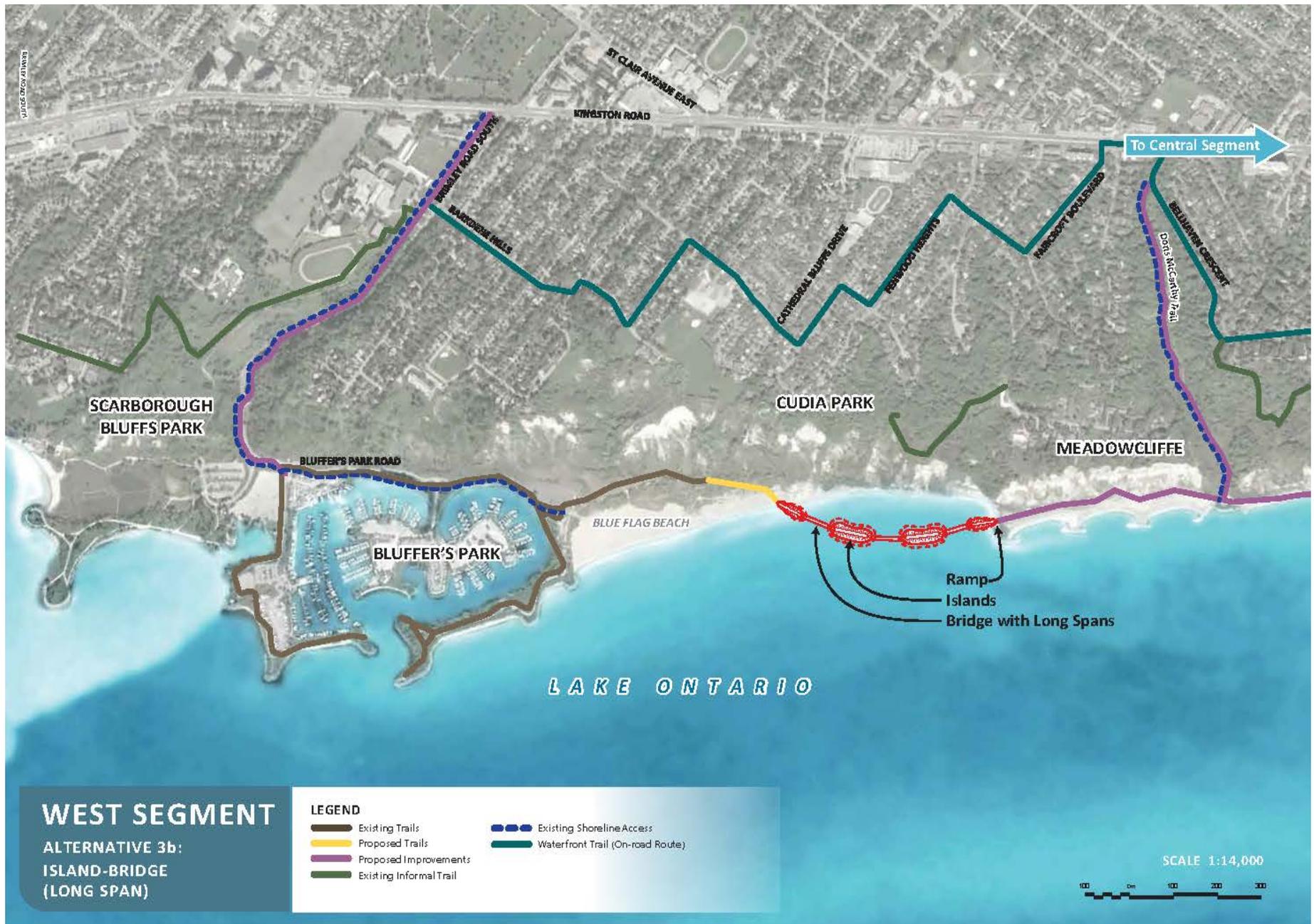
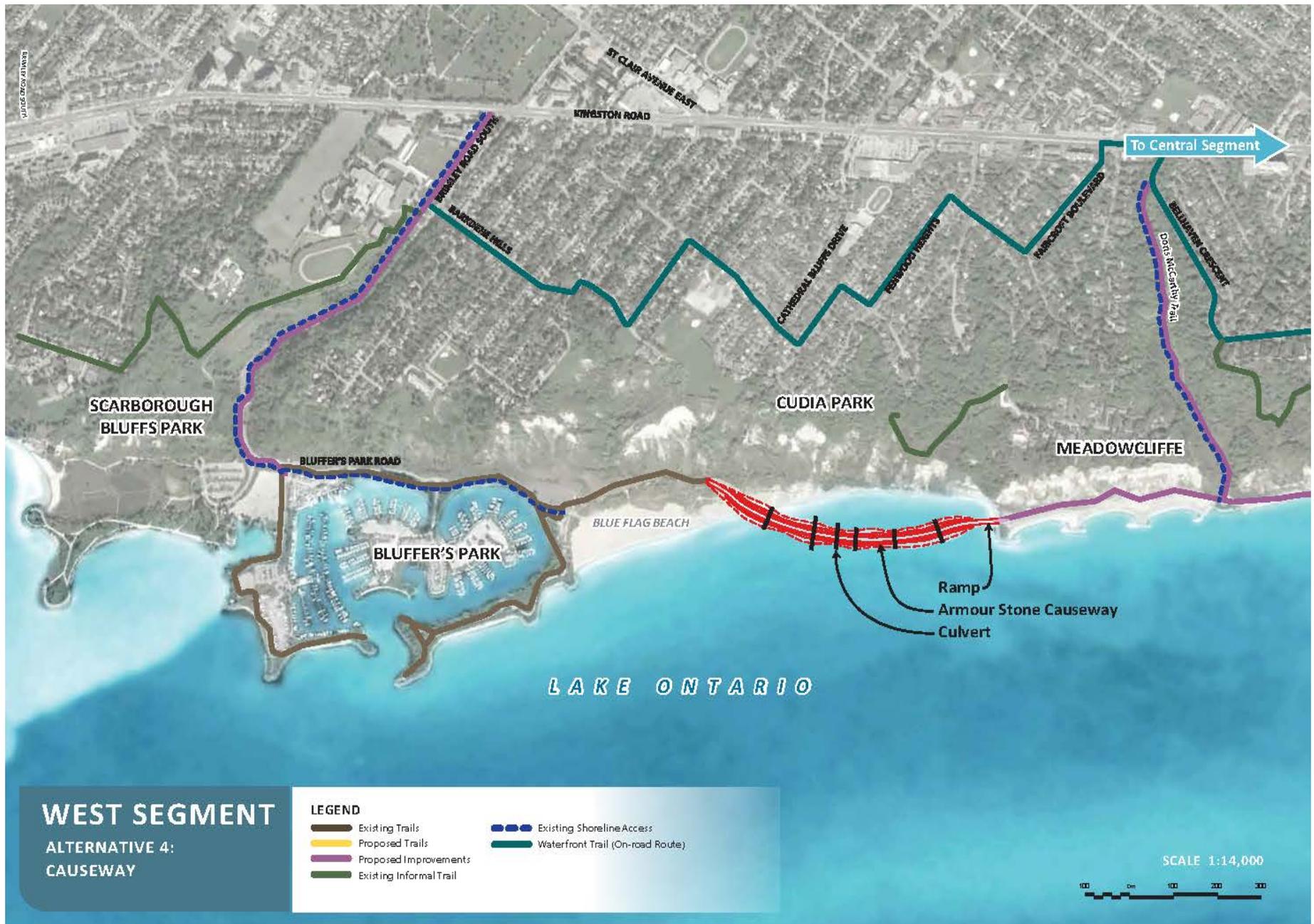


Figure 5-8: West Segment, Alternative 4: Causeway – Overview.



Aquatic habitat enhancement opportunities associated with this Alternative includes the increased shoreline substrate type diversity through the addition of larger rocky substrate.

The culverts in the causeway will provide minimal water circulation between the lake and the enclosed basin. Any talus is likely to remain within the enclosed basin and aquatic vegetation is likely to establish. Toe erosion at the base of Cudia Park will be nearly eliminated. The bluff would begin to self-stabilize although crest migration would still occur while that process continues.

5.3.1.6 West Segment, Alternative 5A/5B: Beach Expansion (Narrow/Wide)

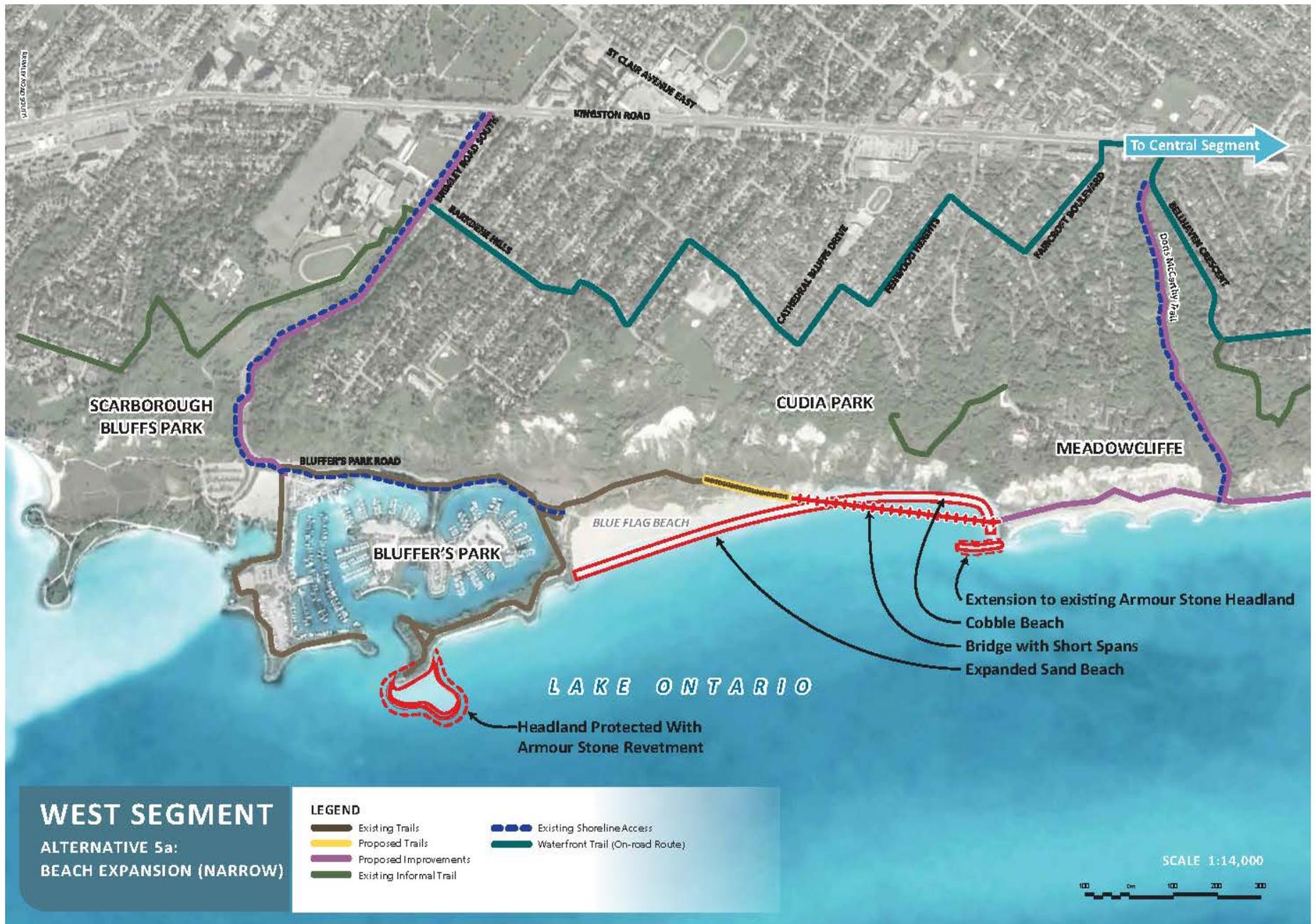
Alternative 5A includes an expansion of the existing beach by approximately 30 m into Lake Ontario between Bluffer's Park and Meadowcliffe (**Figure 5-9**). Cobble would be located at the east end of the beach only. Included would be an extension to the existing armourstone headland at the east end near Meadowcliffe by approximately 100 m. The Alternative would also include a short span bridge crossing (to the same specifications as provided for West Segment, Alternative 2A). The existing headland in the west end at Bluffer's Park would be expanded and protected with an armourstone revetment that would extend into Lake Ontario by approximately 130 m. The area of infill required would be approximately 49,000 m², for the full beach build-out. The Alternative would be designed to provide continuous beach protection from Bluffer's Park to Meadowcliffe. Expansion of the headland at Bluffer's Park would be minimized to the size required to retain a beach that extends to Meadowcliffe. The extended headland will reduce the boat basin entrance dredging frequency, allowing for safe passage in and out of the basin. This minimum width beach requires a bridge span to connect the trail at Meadowcliffe to the wider area of beach at Bluffer's Park.

Alternative 5B includes an expansion of the existing beach by approximately 60 m into Lake Ontario between Bluffer's Park and Meadowcliffe (**Figure 5-10**). The Alternative also includes an extension to the existing armourstone headland at the east end near Meadowcliffe by approximately 200 m and an expansion to the existing headland at the west end of Bluffer's Park by approximately 230 m into the lake. This Alternative would also result in a reduction in the boat basin entrance dredging frequency, allowing for safe passage in and out of the basin. The area of infill required would be approximately 109,000 m² for the full beach build-out. The Alternative would be designed to provide a continuous sand beach connection between Bluffer's Park and Meadowcliffe within the widened beach. This increased beach width requires substantially larger headlands to retain the beach sand.

Aquatic habitat enhancement opportunities associated with both Alternatives include increased diversity of fish habitat associated with the longer, more irregular shoreline of the expanded headlands and the addition of larger substrate.

Toe erosion at the base of Cudia Park would be halted. The bluff would begin to self-stabilize, although crest migration would still occur while that process continues.

Figure 5-9: West Segment, Alternative 5A: Beach Expansion (Narrow) – Overview



5.3.2 Central Segment Alternatives

The following presents the Alternatives developed in the Central Segment. Two Alternatives plus the “Do Nothing” Alternative were developed for this Segment. Both Alternatives involve extension of land base at the Sylvan and Guild Park and Gardens sections to provide long-term stability of the existing shoreline works, and safe public access along the shoreline lakeward of the risk line.

5.3.2.1 Central Segment, Do Nothing (Leave As Is)

Under the “Do Nothing” Alternative there would be no major infrastructure changes to the shoreline other than ongoing maintenance of the Guild construction access route as well as minor shoreline stabilization works as required. It is expected that the public will continue to use the construction access route as an informal trail along the shoreline even though some sections of it are within the risk line and too near the bluff face. Improvements to the Guild Park and Gardens may occur as per their Management Plan. Improvements to the Guild Park and Gardens revetment will likely be required on an ongoing basis in the future (which largely consists of construction rubble). While a 2005 **Class EA** was undertaken to identify a preferred option for providing long-term protection to the Guild Park and Gardens shoreline, the Project was never implemented as a comprehensive solution for the shoreline as a whole was preferred. **Figure 5-11** illustrates the “Do Nothing” Alternative.

5.3.2.2 Central Segment, Alternative 1: Headland Beach

For the base of the Doris McCarthy Trail, a new headland beach system is proposed with two new headlands and the extension of an existing headland into the lake at the east end of the Meadowcliffe shoreline protection section (**Figure 5-12**).

For the Guild Park and Gardens area, new headland features are proposed with cobble beaches in-between, which will address aesthetics by covering the existing exposed rebar along the shoreline. The maximum distance of the extension from the shoreline into the water would be approximately 100 m. A new approximately 130 m-long headland is also proposed to the east at the base of the existing Guild Park and Gardens construction access route. This Alternative is consistent with the Preferred Alternative from the 2005 Class EA that was not implemented. The purpose of this Alternative is to reassess that Preferred Alternative from the 2005 Class EA. The maximum distance for the extension from the existing shoreline into the water would be approximately 100 m.

The area of infill required would be approximately 65,000 m².

The shoreline sections near the base of Doris McCarthy Trail and the Guild Park and Gardens would be designed to provide a gathering space, while reducing wave overtopping levels and making public access along the shoreline safer. The extent of the gathering space into the lake was determined by the re-grading of the existing Guild construction access route to meet AODA requirements. While existing rubble is protecting the toe of the bluff, it does not provide long-term shoreline protection, and the existing shoreline construction route is within the risk line, and thus potentially unsafe for pedestrian access.

Figure 5-11: Central Segment, Do Nothing (Leave Shoreline As Is) – Overview

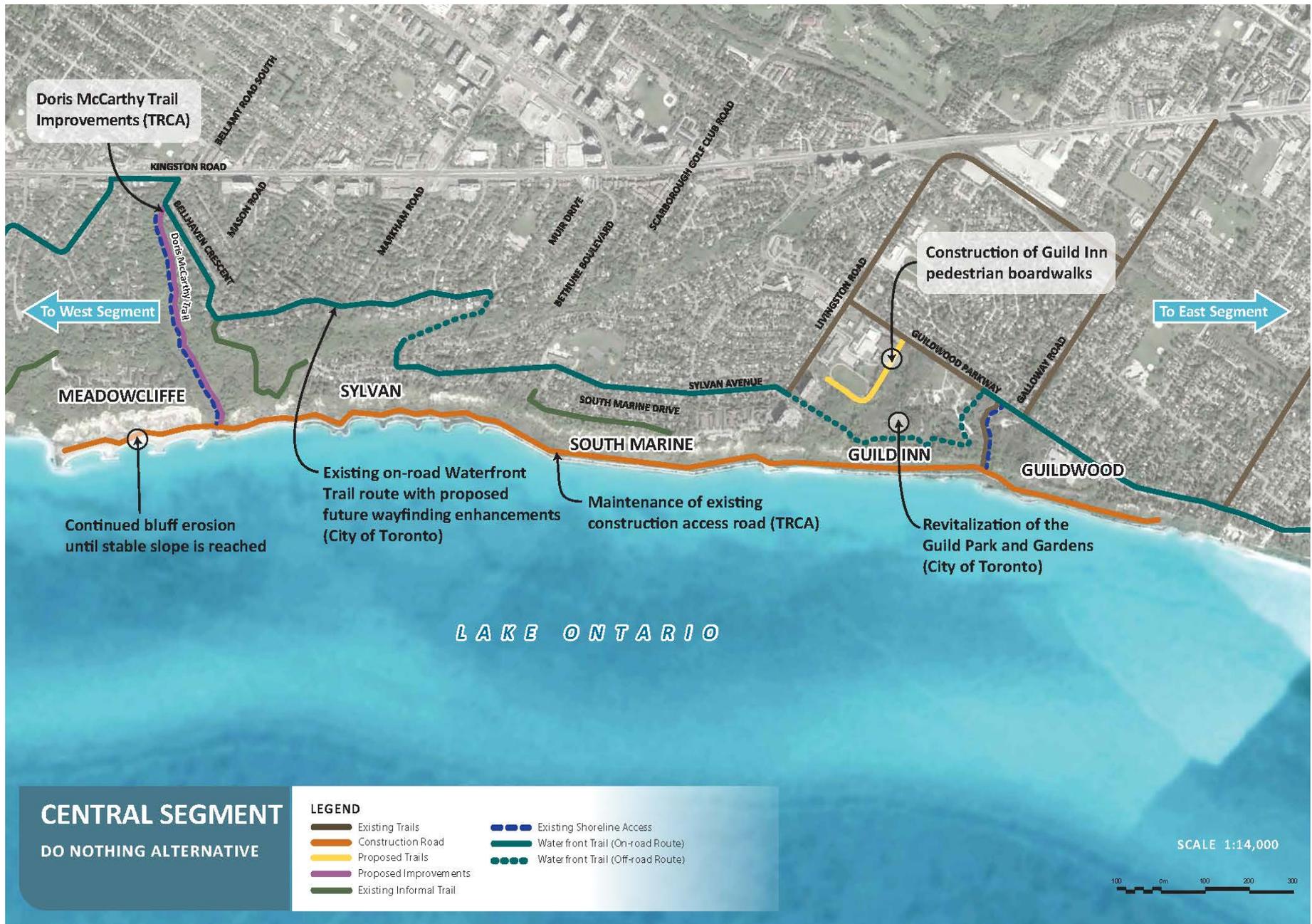
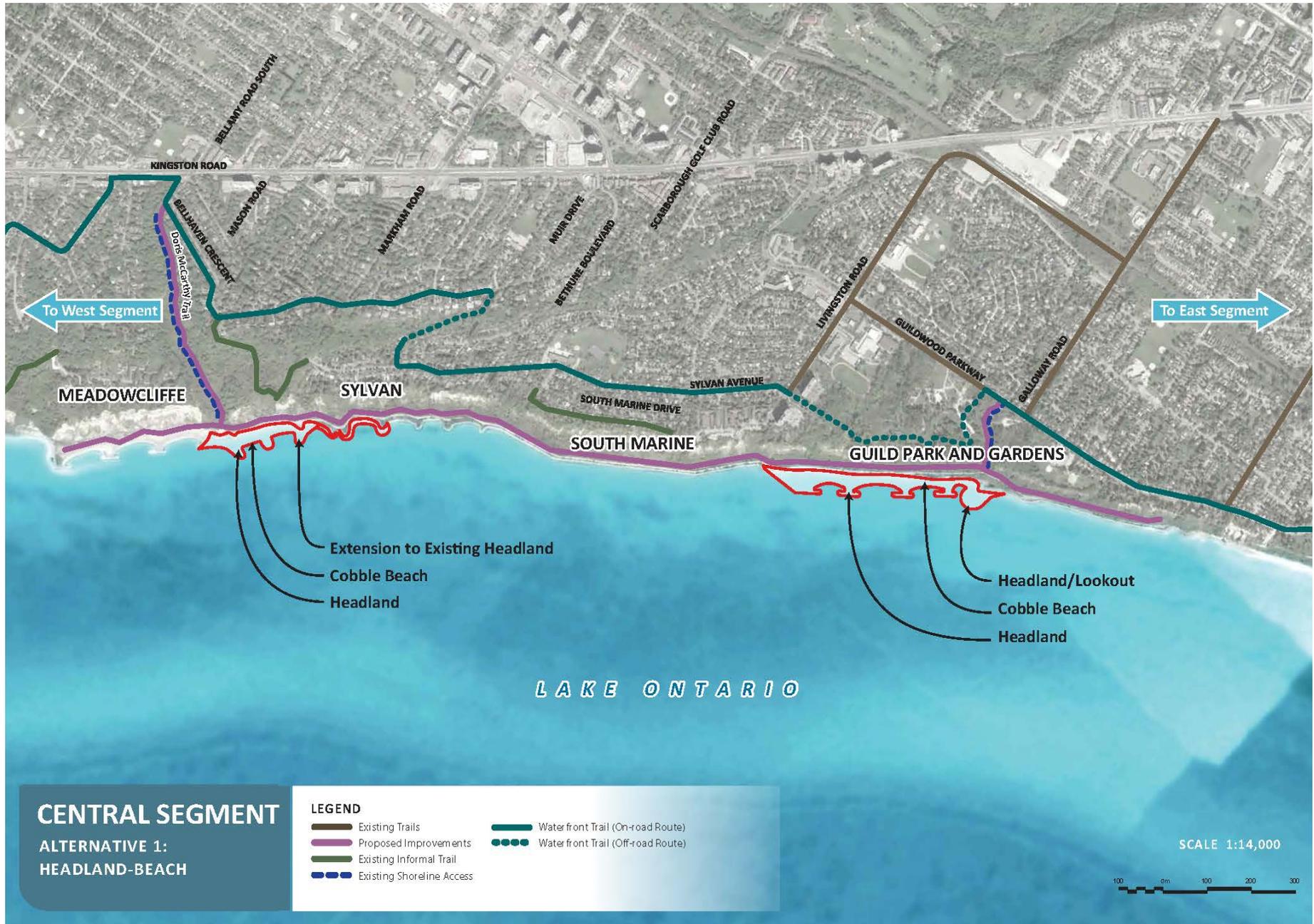


Figure 5-12: Central Segment, Alternative 1: Headland Beach – Overview



Aquatic habitat enhancement opportunities associated with this Alternative include increased diversity of fish habitat as a result of the addition of the headland beach system, with the artificially-filled cobble beaches.

5.3.2.3 Central Segment, Alternative 2: Revetment

For the base of the Doris McCarthy Trail, the same new headland beach described for Central Segment Alternative 1 is proposed (**Figure 5-13**). A revetment was also contemplated here but not pursued as it would appear out of place with the existing headland beaches on either side (Meadowcliffe and Sylvan).

For the Guild Park and Gardens area, instead of a headland beach system which is proposed in Central Segment Alternative 1, this Alternative would involve a new armourstone revetment feature with an 80 to 130 m-long headland/lookout to the east of it at the base of the existing Guild construction access route. The revetment would extend approximately 30 m into Lake Ontario, and will address aesthetics by covering the existing exposed rebar along the shoreline. The area of infill required would be approximately 42,000 m².

The Alternative was designed to provide a more aesthetic, long-term shoreline protection while reducing lake overtopping levels and making public access along the shoreline safer. The existing rubble protection is already providing protection to the toe of the bluff; however, the rubble material does not provide long-term shoreline protection, is within the risk line, and is subject to high wave overtopping rates, and thus potentially unsafe pedestrian access.

Aquatic habitat enhancement opportunities associated with this Alternative are similar to Alternative 1 and include increased diversity of fish habitat as a result of the headland beach feature west of the Sylvan shoreline.

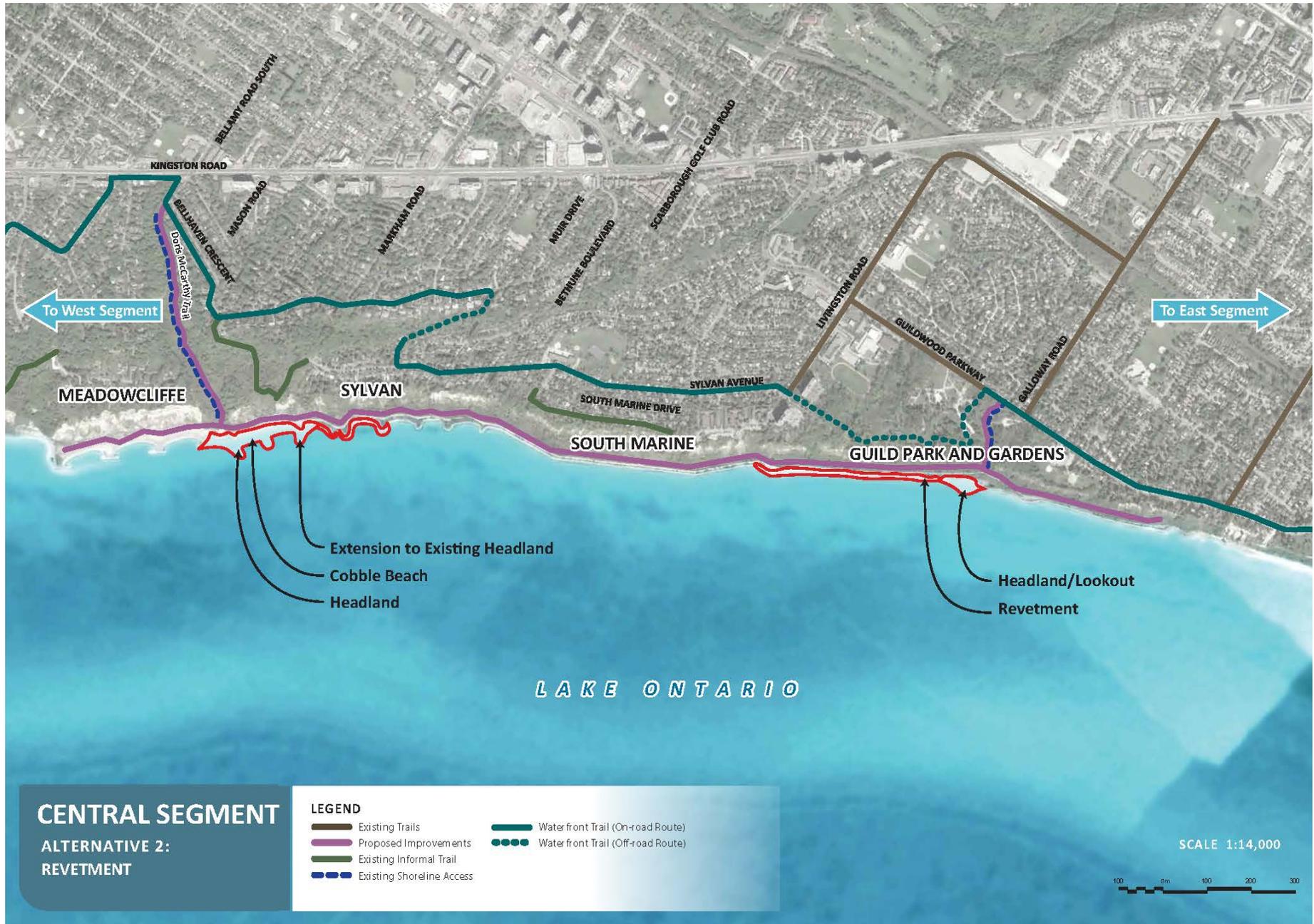
5.3.3 East Segment Alternatives

The following presents the Alternatives developed for the East Segment. Nine Alternatives plus the “Do Nothing” Alternative were developed for this Segment. All Alternatives improve access along the waterfront in this Segment. Unlike the West and Central Segments, the trail location in the East Segment varies between the top and toe of the Bluffs amongst the Alternatives.

5.3.3.1 East Segment, Do Nothing (Leave As Is)

Under the “Do Nothing” Alternative there would be no changes to the existing shoreline. Throughout this section the bluff would continue to erode and tablelands above would be slowly lost through ongoing crest migration. Greyabbey Trail (e.g., road and associated infrastructure) would be at risk from erosion within the planning timeframe of the Project (approximately 60 years). Erosion rates east of Grey Abbey Ravine are less and public infrastructure is set further back from the slope crest, therefore it will not be at risk within at least 100 years or longer.

Figure 5-13: Central Segment, Alternative 2: Revetment – Overview



Shoreline access along East Point Park is informal and at risk, and is publicly inaccessible west of the park due to private property and critical infrastructure. The only publicly accessible access point to this shoreline is east of the park at Beechgrove Drive. Many informal trails down to the shoreline exist, which negatively impact sensitive bluff vegetation communities through fragmentation and trampling and also pose a risk to users as a number of these informal trails are within existing erosion gullies and previous slope failures. Additionally, informal access along this shoreline is restricted at various times throughout the year when lake levels rise, reaching the toe of the Bluffs.

Through the East Segment, the Waterfront Trail is located on the tablelands or on roadways. The primary signed Waterfront Trail route travels north on Morningside Avenue, east on Coronation Drive, and south on Manse Road to connect with Copperfield Road. An off-road connection of the Waterfront Trail passes through Grey Abbey Park, continues along the western edge of the Grey Abbey Ravine, parallels the south side of the Metrolinx rail corridor and then connects with Copperfield Road. The planned expansion of the rail corridor through this Segment will result in constraining the trail through this area. In addition, with the expansion of the rail corridor, trains are anticipated to cross every seven minutes in either direction.

Figure 5-14 illustrates the “Do Nothing” Alternative for the East Segment.

5.3.3.2 East Segment, Alternative 1A/1B: Headlands with Top-of-Bluffs/Base-of-Bluffs Connection

Alternative 1A includes the removal of the existing breakwater feature at the east end of the Guildwood Parkway shoreline protection section and the construction of a headland beach that extends to the east side of the Grey Abbey Ravine (**Figure 5-15**).

The headlands constructed parallel to the shore would vary in length from approximately 40 to 100 m and the easternmost headland, which curves back to shore, would be approximately 180 m long. The headlands would extend up to 80 m into the lake. The area of infill required would be approximately 48,000 m². The beach cobble size would vary depending upon the headland length and spacing.

At the mouth of the Grey Abbey Ravine, a staircase structure would extend up to connect with a pedestrian/cycling bridge that would pass over the ravine (about 100 m in length) and connect with a new trail that would run along the top of the bluff to connect with East Point Park.

Alternative 1B is the same as Alternative 1A, but also incorporates an armourstone revetment that would protect the shoreline from Grey Abbey Park to the east side of East Point Park (**Figure 5-16**). The revetment would extend approximately 30 m offshore. As a pedestrian and cycling trail would be possible along the full length of the shoreline behind the revetment, there would be no bridge crossing of the Grey Abbey Ravine and/or pathway/stairs to access the tablelands from the bottom of the ravine. To access the revetment at the east end, the Beechgrove Drive extension down to the water’s edge would be improved and formalized.

Expected aquatic habitat improvements with these Alternatives include increased irregularity and shoreline substrate diversity.

Figure 5-14: East Segment, Do Nothing (Leave Shoreline As Is) – Overview

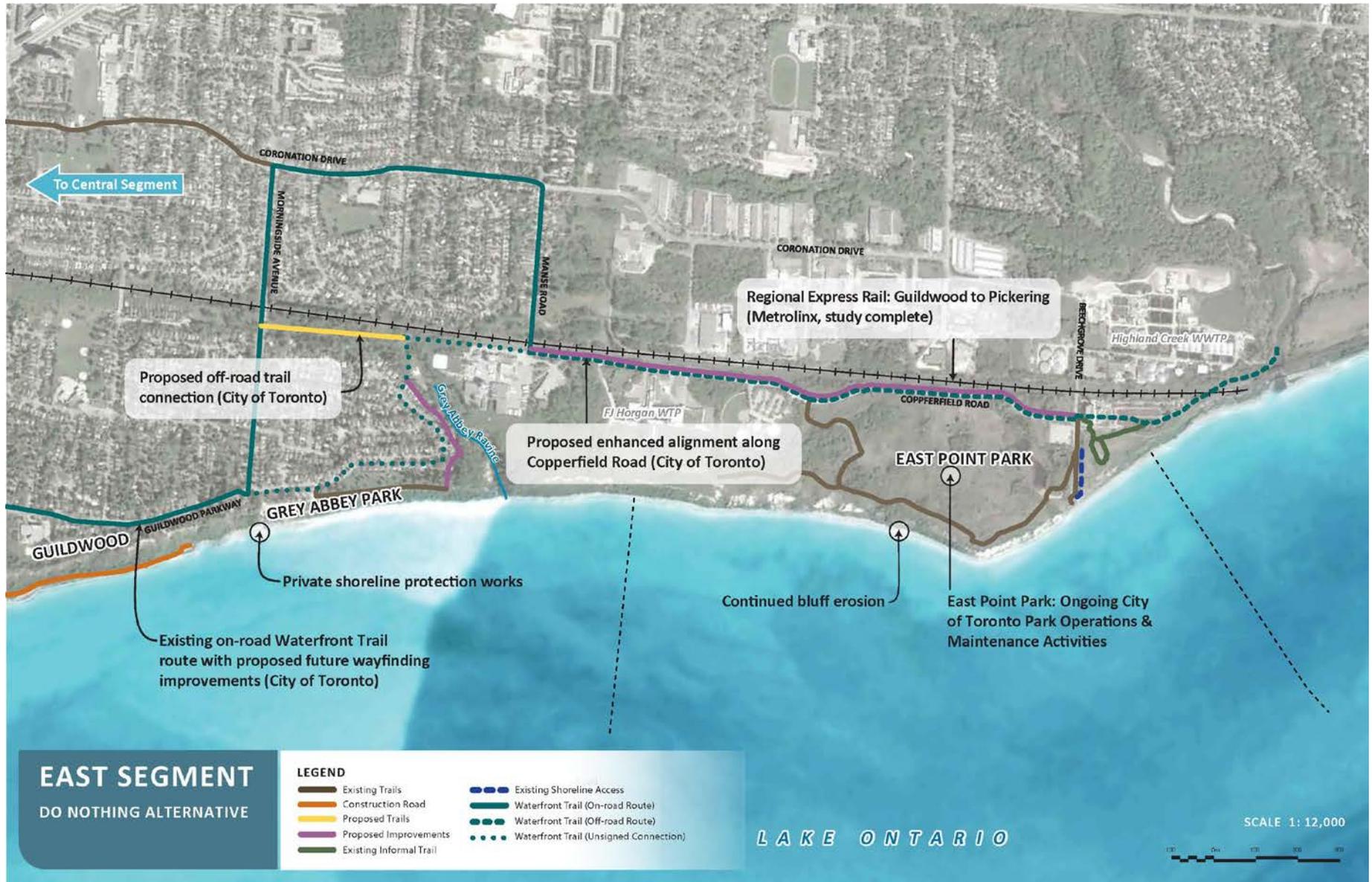


Figure 5-15: East Segment, Alternative 1A: Headland Beach with Top-of-Bluffs Connection – Overview

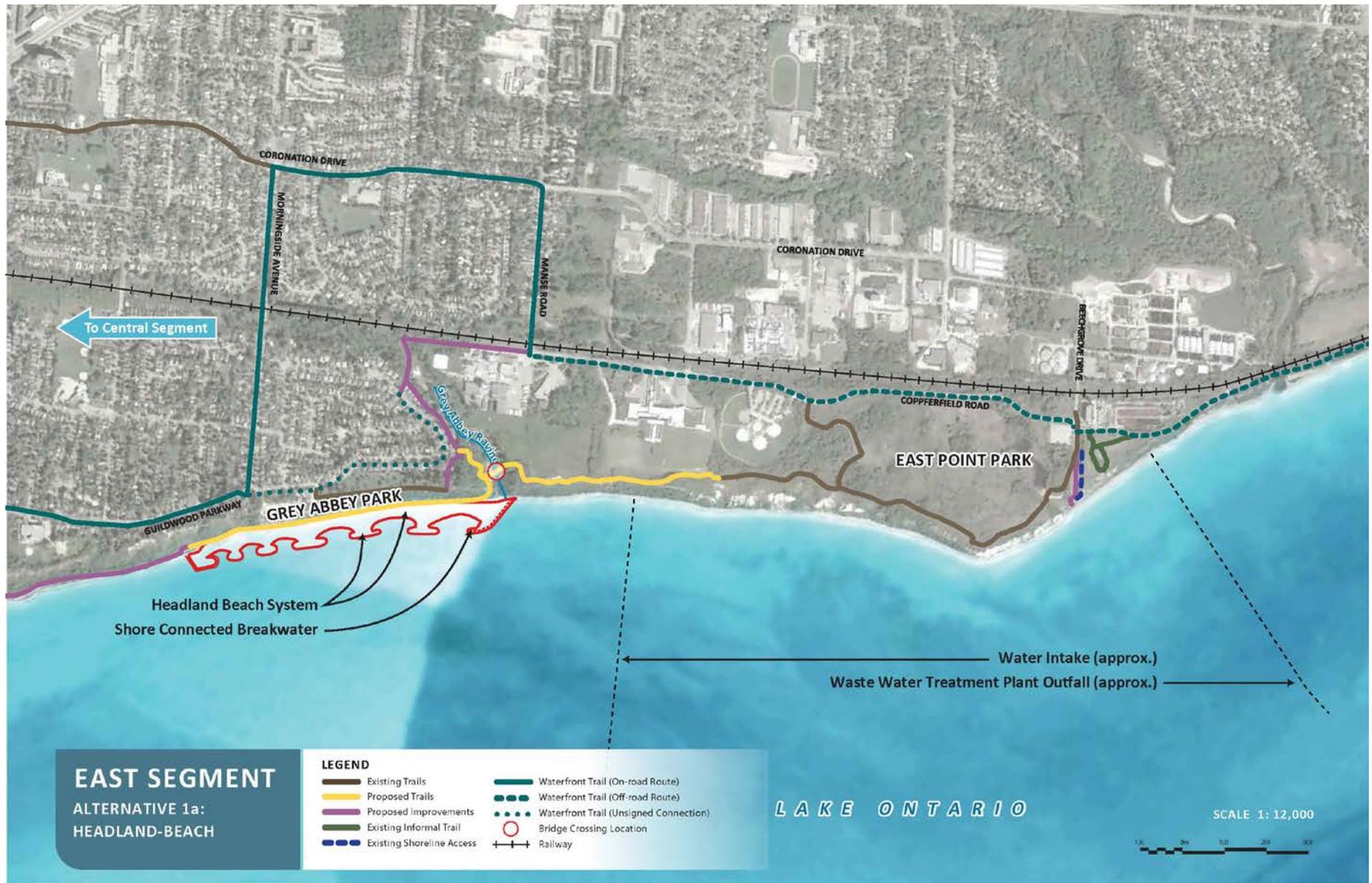
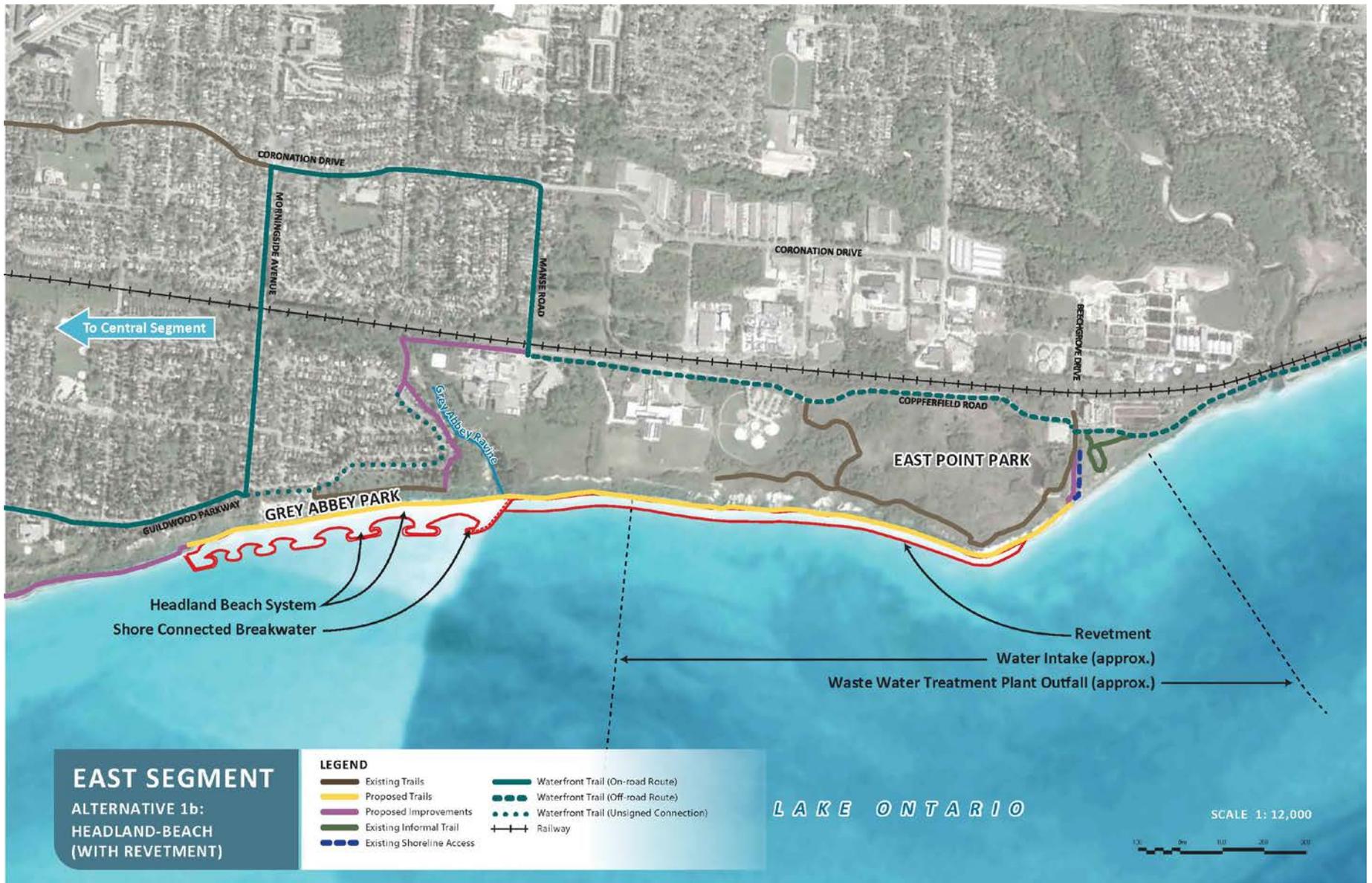


Figure 5-16: East Segment, Alternative 1B: Headland Beach with Base-of-Bluffs Connection (Revetment) – Overview



5.3.3.3 East Segment, Alternative 2A/2B: Bridge with Top-of-Bluffs Connection (Headlands/Headlands + Revetment)

Alternative 2A includes a bridge shoreline connection at the east end of the Guildwood Parkway section and a headland beach below Grey Abbey Park (**Figure 5-17**). The bridge would be constructed with approximately 30 m long spans and would be located approximately 40 m offshore. It would be approximately 430 m long. The bridge would be supported on steel piers surrounded by scour protection. The elevation of the bridge would be outside of the wave uprush area, approximately 77.5 mASL (about 2.5 m above typical lake levels). The purpose of the bridge would be to provide a pedestrian/cycling connection from the existing revetment at Guildwood Parkway to the headland beach at Grey Abbey Park.

The headland beach at Grey Abbey Park would consist of approximately 100 m-long headlands to retain a cobble beach. The headlands would extend approximately 70 to 80 m offshore. The area of infill required would be approximately 26,000 m². The eastern-most headland would extend to the eastern side of Grey Abbey Ravine.

The headland beach would halt toe erosion along the Grey Abbey Park shoreline, although the bridge would have no noticeable impact on erosion of the shoreline fronts.

At the mouth of Grey Abbey Ravine, a staircase structure would extend up to connect with a pedestrian/cyclist bridge that would pass over the ravine (about 100 m in length) and connect with a new trail that would run along the top of the bluff to connect with East Point Park.

Alternative 2B is the same as Alternative 2A, but also incorporates an armourstone revetment that would protect the shoreline from Grey Abbey Park to the east side of East Point Park (**Figure 5-18**). The revetment would extend approximately 30 m offshore. As a pedestrian and cycling trail would be possible along the full length of the shoreline behind the revetment, there would be no bridge crossing of the Grey Abbey Ravine and/or pathway/stairs to access the tablelands from the bottom of the ravine. To access the revetment at the east end, the Beechgrove Drive extension down to the water's edge would be improved and formalized.

Potential aquatic habitat improvement opportunities associated with both Alternative 2A and 2B include increased irregularity and shoreline substrate diversity of aquatic habitat.

5.3.3.4 East Segment, Alternative 3A/3B: Island-Bridge with Top-of-Bluffs Connection (Headland Beach/Headland Beach + Revetment)

Alternative 3A is the same as East Segment Alternative 1A, but replaces the western end of the headland beach with an island-bridge connection (**Figure 5-19**). The connection would consist of an approximately 60 m-long bridge with segments spanning approximately 50 to 60 m. The islands would be located up to 70 to 80 m into the lake. The islands would have a crest elevation above the wave uprush and overtopping height of approximately 79 mASL (4 m above typical lake level). The area of infill required would be approximately 48,000 m². The bridge spans would be supported by steel piers extending through the islands. Given the close proximity of the islands to the shoreline, it is expected that over time as a result of sediment deposition, the "islands" would connect with the mainland.

Figure 5-17: East Segment, Alternative 2A: Bridge with Top-of-Bluffs Connection (Headland Beach) – Overview

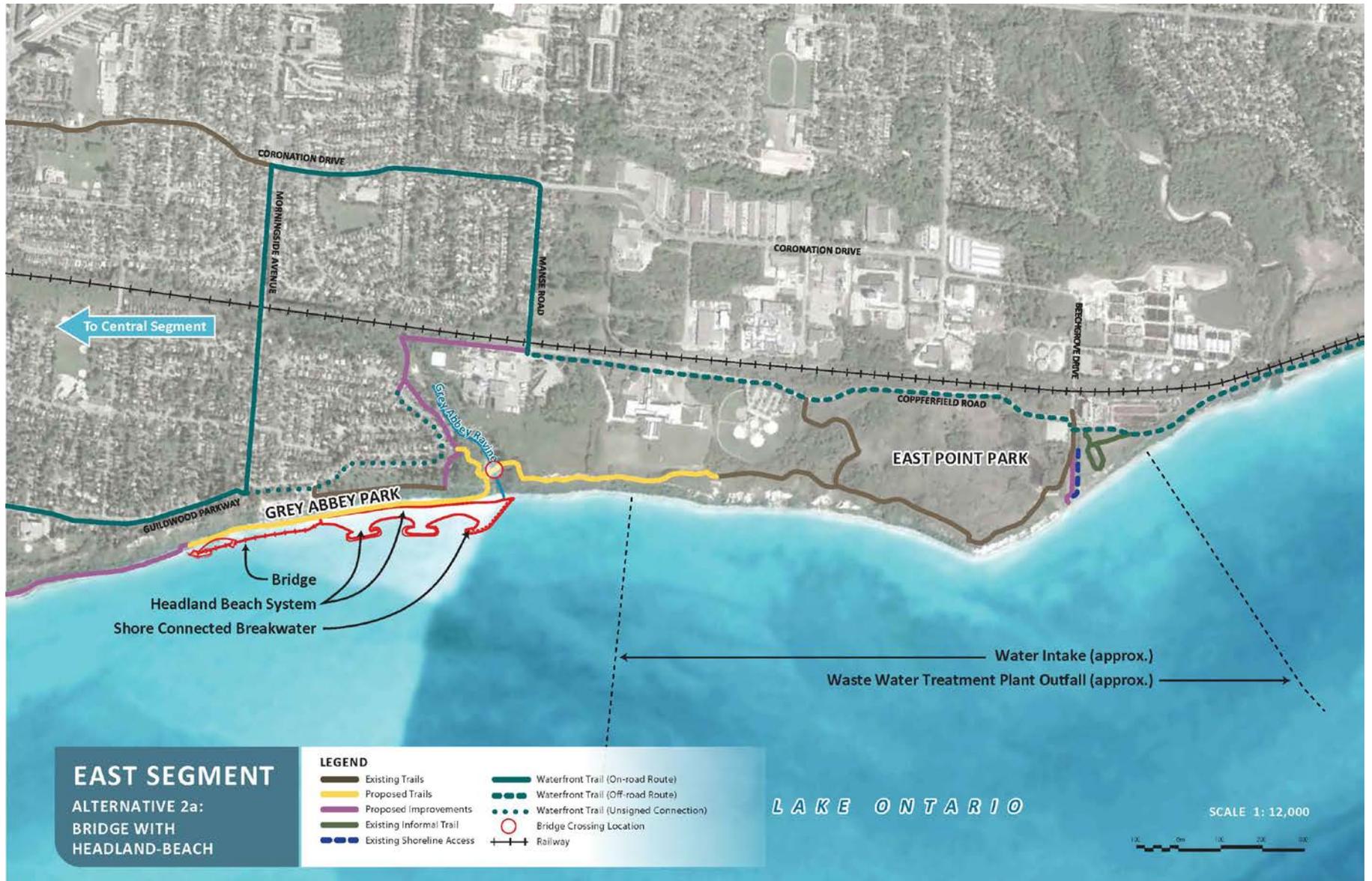


Figure 5-18: East Segment, Alternative 2B: Bridge with Base-of-Bluffs Connection (Headland Beach + Revetment) – Overview

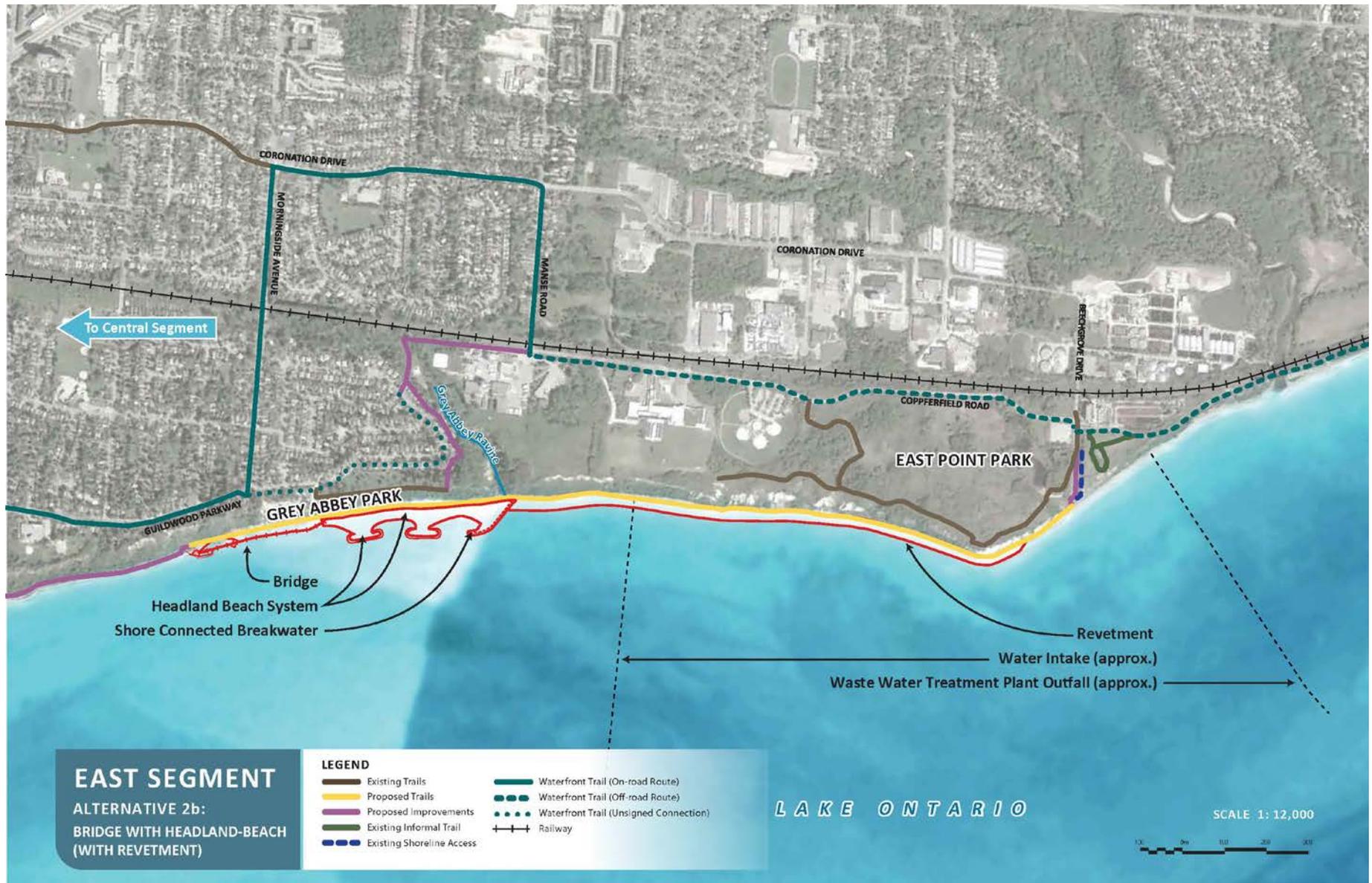
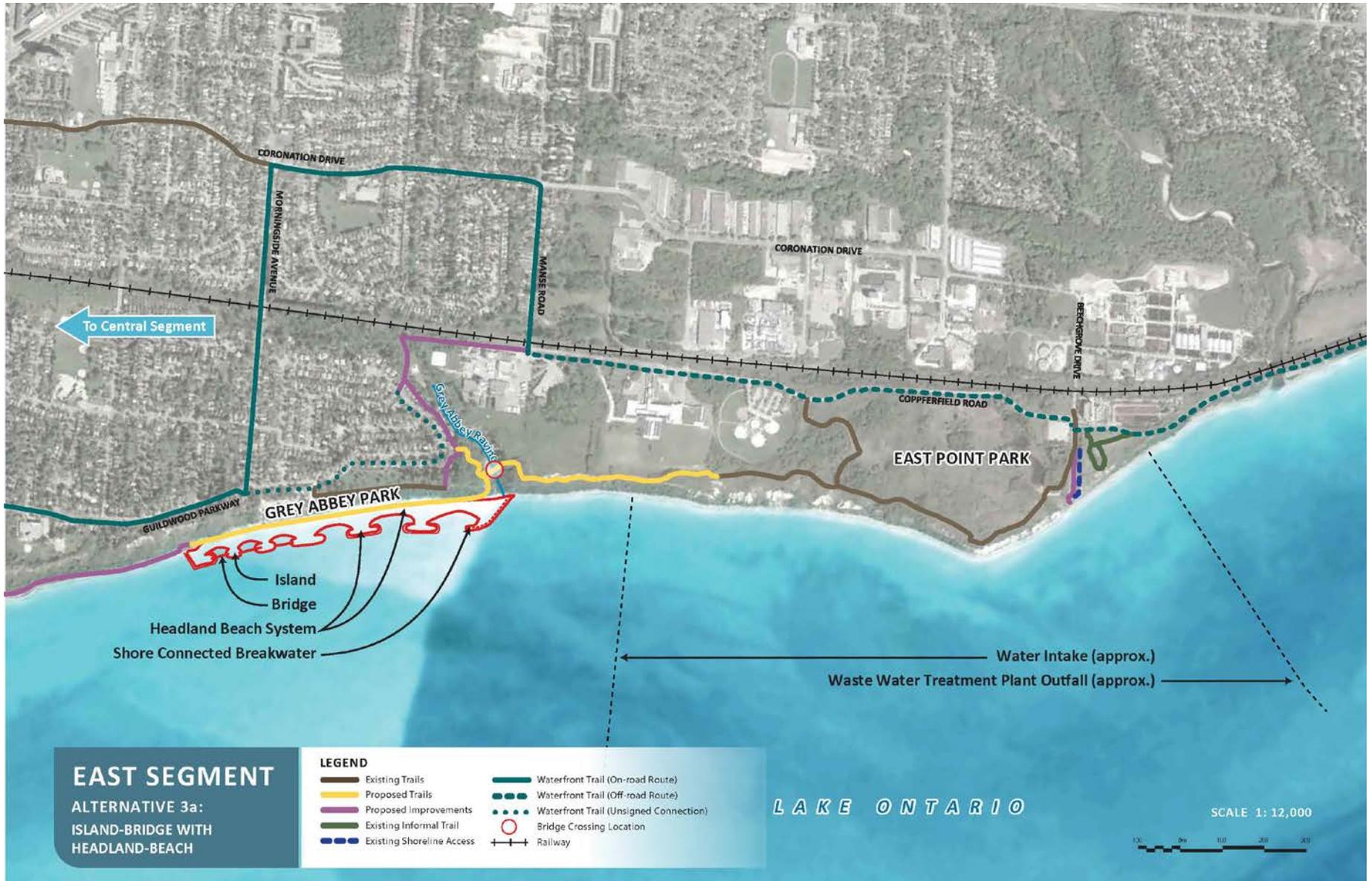


Figure 5-19: East Segment, Alternative 3A: Island-Bridge with Top-of-Bluffs Connection (Headland Beach) – Overview



At the mouth of the Grey Abbey Ravine, a staircase structure would extend up to connect with a pedestrian/cycling bridge that would pass over the ravine (about 100 m in length) and connect with a new trail that would run along the top of the bluff to connect with East Point Park.

Alternative 3B is the same as East Segment Alternative 3A, but also incorporates an armourstone revetment that would protect the shoreline from Grey Abbey Park to the east side of East Point Park (**Figure 5-20**). The revetment would extend approximately 30 m offshore. As a pedestrian and cycling trail would be possible along the full length of the shoreline behind the revetment, there would be no bridge crossing of the Grey Abbey Ravine and/or stairs up to the tablelands. To access the revetment at the east end, the Beechgrove Drive extension down to the water's edge would be improved and formalized.

Potential aquatic habitat improvement opportunities associated with both Alternative 3A and 3B include increased shoreline irregularity and shoreline substrate diversity.

5.3.3.5 East Segment, Alternative 4A/4B: Headland Beach with Revetment to East Point Park/Headland Beach to East Point Park

Alternative 4A includes the removal of the existing breakwater feature at the east end of the Guildwood Parkway shoreline protection section and the construction of a headland beach that extends to the east side of Grey Abbey Ravine (**Figure 5-21**).

The headlands constructed parallel to the shoreline would vary in length from approximately 40 to 100 m and the easternmost headland, which curves back to shore, would be approximately 180 m long. The headlands would extend up to 80 m into Lake Ontario. The beach cobble size would vary depending upon the headland length and spacing.

Alternative 4A also includes a revetment that would protect the shoreline from Grey Abbey Park to approximately 650 m east of Grey Abbey Ravine. The revetment would extend approximately 30 m offshore. For the combined area (headland and revetment) the amount of infill required would be approximately 59,000 m².

A trail would be possible along the length of the headland beach and revetment, with a formal tableland-waterfront connection approximately 650 m east of Grey Abbey Ravine, south of the baseball diamonds at East Point Park. At this location, there is an existing, well-used informal trail down the side of the Bluffs, which has a more gradual slope. At the proposed location of the trail shown in **Figure 5-22**, the bluff is about 25 m high and so to achieve a path slope of 7.5%, the total length of the trail would need to be about 500 m. Some trimming of the upper oversteepened slope face (extending up to 10 m from the present crest position) would be required to reduce risk from slope failure, and some fill would be required to raise the base of the trail in order to achieve the length of trail required. Depending on the nature of the trail, the slope face that could be affected would be in the range of 3,560 m².

Alternative 4B is the same as East Segment Alternative 4A, however, it replaces the revetment portion proposed for the east end with a continued headland beach (**Figure 5-23**).

Figure 5-20: East Segment, Alternative 3B: Island-Bridge with Base-of-Bluffs Connection (Headland Beach + Revetment) – Overview

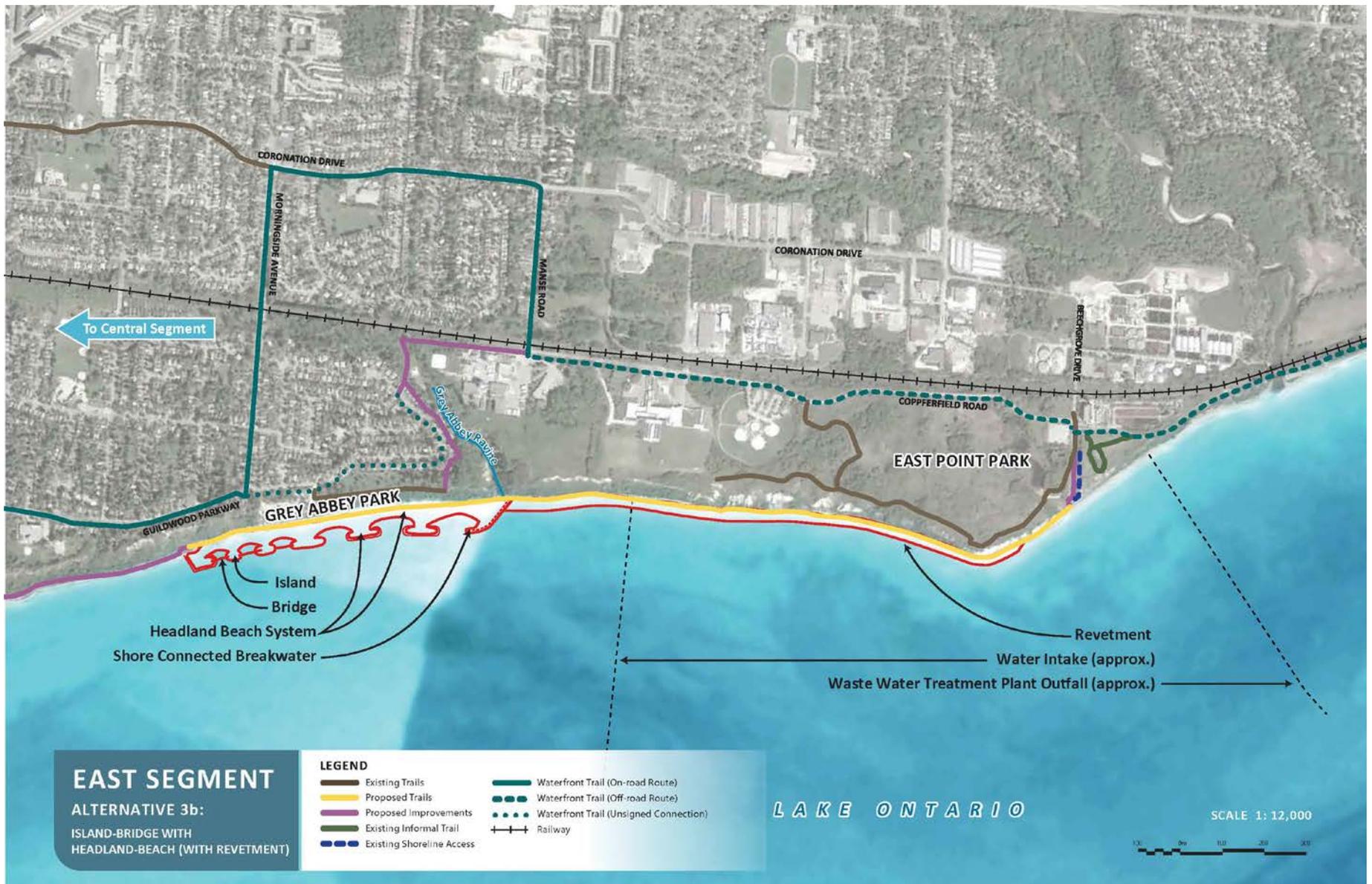


Figure 5-21: East Segment, Alternative 4A: Headland Beach with Revetment to East Point Park – Overview

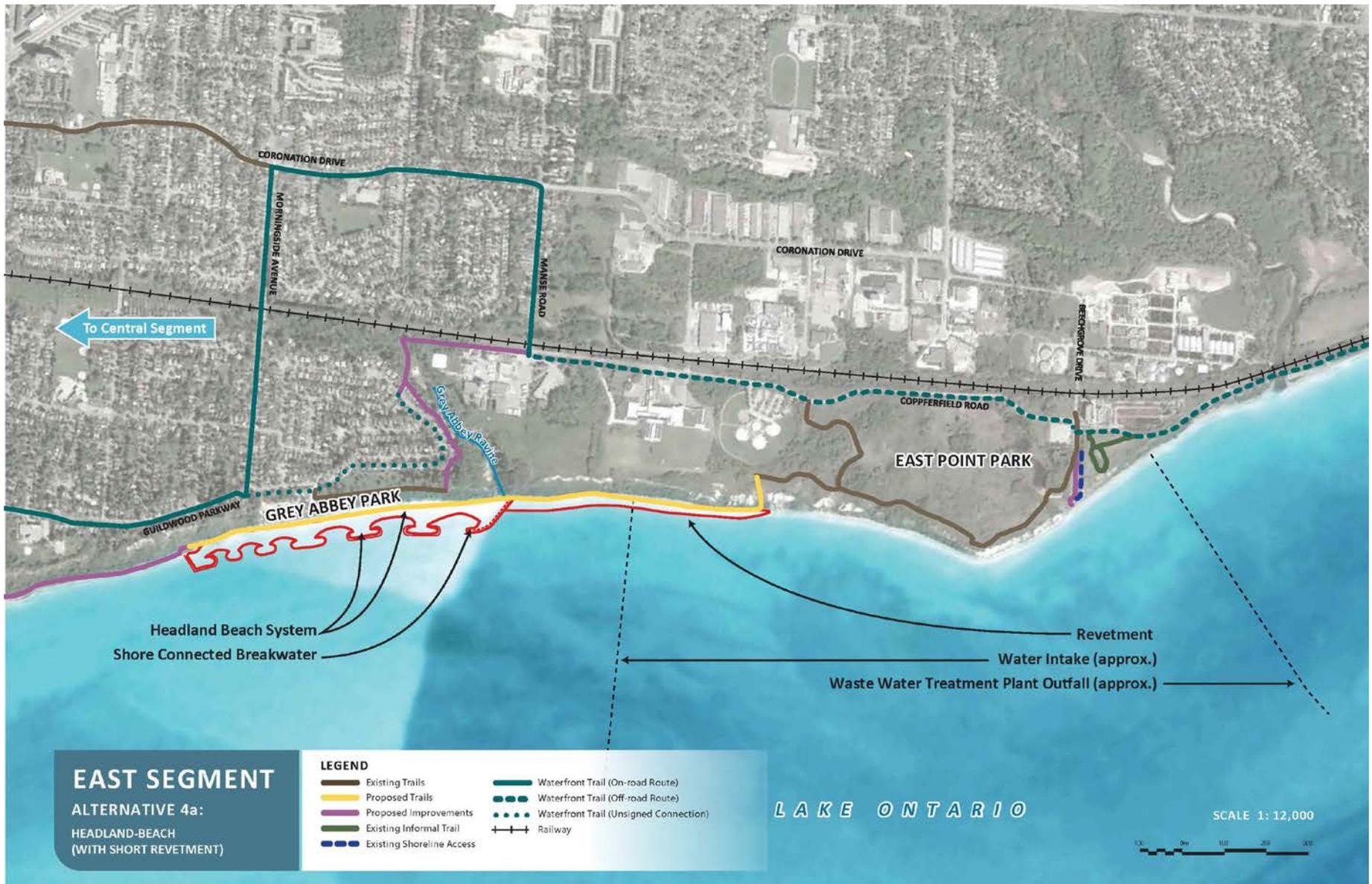


Figure 5-22: Proposed Tableland Connection at East Point Park



Scarborough Waterfront Project

Proposed Tableland Connection At East Point Park

Legend

- Tableland Access
- Cut Area
- Fill Area

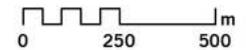
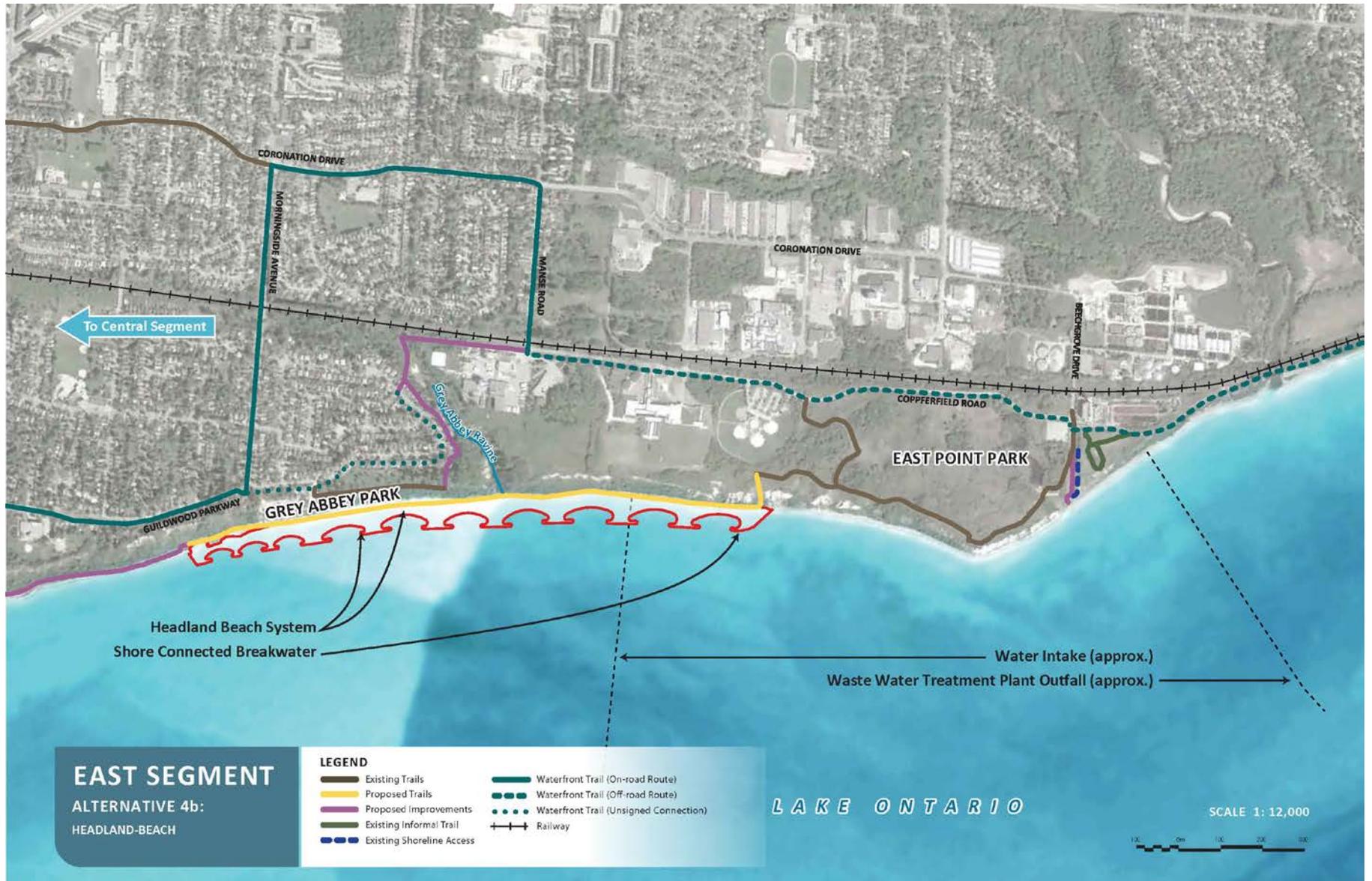


Figure 5-23: East Segment, Alternative 4B: Headland Beach to East Point Park – Overview



The headlands constructed parallel to the shoreline would vary in length from approximately 40 to 100 m and the eastern-most headland, which curves back to shore, would be approximately 180 m long. The headlands would extend up to 80 m into lake. The area of infill required would be approximately 86,000 m². The beach cobble size would vary depending upon the headland length and spacing. As with Alternative 4A, a trail would be created on the bluff face approximately 650 m east of Grey Abbey Ravine south of the baseball diamonds at East Point Park.

Potential aquatic habitat improvement opportunities associated with Alternative 4A and 4B include increased irregularity and shoreline substrate diversity.

5.3.3.6 East Segment, Alternative 5: Tableland Connection Over Grey Abbey Ravine

Alternative 5 would make no change to the shoreline east of the existing Guild construction access route. The shoreline and Bluffs would continue to erode along the sections of shoreline without existing shoreline protection. The trail connection would be along the top of the Bluffs, extending the existing Waterfront Trail from Guildwood Parkway, along the top of the Bluffs, to East Point Park and the Port Union Waterfront Trail terminus at Beechgrove Drive. To complete this trail, a pedestrian/cycling bridge would be constructed to pass over the Grey Abbey Ravine (about 100 m in length). The trail would continue east along the top of the Bluffs to connect with East Point Park (**Figure 5-24**).

5.4 Step 4: Select the Preferred Alternative

The purpose of this step was to evaluate the Alternatives in each of the Project Area Segments (West, Central and East) to identify the Preferred Alternative (i.e., the recommended project or “undertaking”). The Preferred Alternatives in each Segment were then combined to create the overall recommended Preferred Alternative. This Overall Preferred Alternative was then subject to further refinement and development in the next EA process step (see **Chapter 6**)

The evaluation of the Alternatives was undertaken using comparative Criteria and Indicators which were initially presented as draft in the ToR. The evaluation Criteria reflect the Project Vision and Objectives and were all considered to have equal levels of importance.

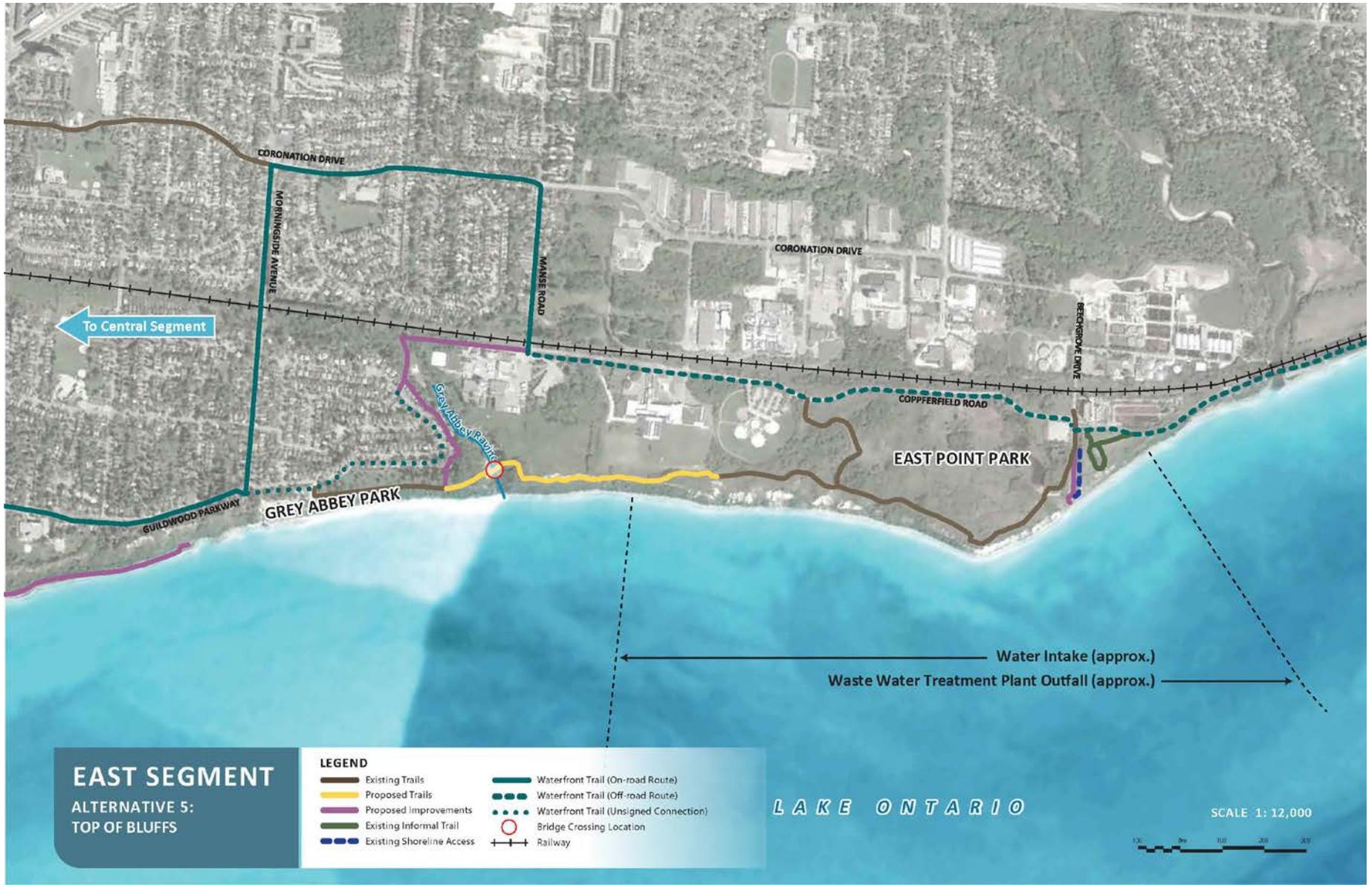
5.4.1 Evaluation Methodology

The comparative evaluation of Alternatives in each Project Area Segment involved three key steps as listed below:

1. Finalization of comparative evaluation Criteria and Indicators;
2. Assessment of net effects (effects remaining after mitigation) by Indicator for each Alternative and determination of the Alternatives’ relative preference ranking (advantages and disadvantages) at an Indicator, Criterion and Objective level; and,
3. Comparative evaluation of the Alternatives in each Project Area Segment to identify the Alternative that best meets the Project Vision and Objectives.

Each of these steps is described further below.

Figure 5-24: East Segment, Alternative 5: Tableland Connection Over Grey Abbey Ravine – Overview



5.4.1.1 Criteria and Indicators

The evaluation Criteria and Indicators used for the comparative evaluation of the Alternatives were initially developed by the EA Technical Team and reviewed by a number of Stakeholders including:

- TRCA
- Stakeholder Committee
- City of Toronto staff
- The public
- Regulatory agencies
- Other interest groups

As previously noted, draft evaluation Criteria were included in the ToR and provided the basis for the finalization of the Criteria and Indicators in the EA. Various departments and individuals at TRCA, the City of Toronto, and other agencies contributed to the finalization of the evaluation Criteria. Sessions were also held with the Stakeholder Committee to gain their input on the Criteria and Indicators. Finally, the draft evaluation Criteria were made available to the public at Public Information Centre (PIC) #1 for review and comment.

The Criteria were organized by the Project Objectives and represent all aspects of the environment as per the *Ontario EA Act*. The Criteria and Indicators are objective-based, meaning they are focused on measuring the extent to which the Alternatives achieve the Project Objectives. As such, the Alternative(s) that best achieve these Objectives are identified as Preferred. An initial long list of Evaluation Criteria and Indicators were developed and then reviewed against Project information to screen out those Criteria and/or Indicators not applicable to the evaluation. For example, screening of the Evaluation Criteria included consideration of whether:

- there were no impacts;
- the feature is not present in the Project Area; and,
- there were no differences between the Alternatives.

Given differences in baseline conditions between the Segments, different Criteria and Indicators were screened from the evaluation for each Segment. **Table 5-1** presents the Criteria and Indicators considered for the comparative evaluations and **Table 5-2** presents the Criteria and Indicators screened out by Segment and the rationale for the screening.

5.4.1.2 Effects Assessment and Ranking

Each Alternative within each Segment was assessed on the basis of each Criterion and corresponding Indicator(s). The Effects Assessment considered the collected baseline data (see **Chapter 3**), Stakeholder input, and technical expertise to determine the benefits of the Alternative and/or how each Alternative would negatively impact the environment. Considering the conceptual nature of the Alternatives, the assessment was largely qualitative in nature although some quantitative measurements were taken for some Indicators (e.g., area of infill).

Table 5-1: Criteria and Indicators Considered for the Comparative Evaluation

Objectives	Criteria	Indicators	Indicator Definitions	Mitigation	Ranking Measures
Protect and enhance terrestrial and aquatic natural features and linkages	Extent of aquatic habitat enhanced or diminished	Ability to increase shoreline morphology by increasing shoreline irregularity	As supported by long-term monitoring data, open coast shorelines with more complex profiles result in increased species richness. Each Alternative results in an impact to shoreline morphology. Increasing the morphology via increasing irregularity improves essential aquatic habitat and benefits local resident and migratory fish (including SAR American Eel) while providing optimal functional open coast habitat. In particular, a complex shoreline profile provides for increased foraging opportunities, cover, and shelter.	No mitigation measures identified as this Indicator measures the quality of habitat created.	MP = Alternative that has the highest ability to increase shoreline morphology via increasing irregularity P = Alternative with second-highest ability IP = Alternative with second-lowest ability LP = Alternative with lowest or no ability
		Ability to increase shoreline substrate type diversity	As supported by long-term monitoring data, more diverse open coast shorelines support increased species richness. Each Alternative results in an impact to shoreline substrate type composition. Increases in the relative amounts of cobble and boulder substrate, in relation to sand, brings the shoreline closer to historical conditions. This increased diversity improves essential aquatic habitat and benefits local resident and migratory fish, including SAR American Eel, while providing optimal functional open coast habitat. In particular, increased shoreline substrate diversity provides more foraging, cover and shelter opportunities for fish.	No mitigation measures identified as this Indicator measures the quality of habitat created.	MP = Alternative that has the highest ability to increase shoreline substrate type diversity P = Alternative with second-highest ability IP = Alternative with second-lowest ability LP = Alternative with lowest or no ability
		Potential for aquatic habitat loss or modification	Alternatives differ in terms of their overall footprint , as indicated by their area of infill. Alternatives with the most infill have the potential to result in the highest amount of existing habitat lost or modified. As this does not consider the quality of the habitat, and as the Alternatives' conceptual designs can be refined to minimize the footprint overall, this Indicator considers the potential for habitat loss only, as compared to the other Alternatives. Alternatives with a small amount of or no infill will be ranked higher.	No mitigation measures identified as this Indicator measures the quantity of habitat lost and the area lost has been minimized to the extent possible through design.	MP = Alternative does not involve infill P = Alternative involves a small amount of infill IP = Alternative involves a medium to high amount of infill LP = Alternative that involves the highest amount of infill
	Extent of terrestrial habitat attributes enhanced or diminished	Potential to create appropriate land-water interface	Potential exists to create land-water interface that benefits terrestrial species. Where the interface provides ease of access for wildlife and is always out of the water, the Alternative is preferred.	No mitigation measures identified as this Indicator measures the quality of habitat created.	MP = Highest quality land-water interface (highest ease of access and greatest length always out of water) P = Intermediate quality land-water interface IP = Lower quality land-water interface LP = Least quality land-water interface
		Impact to vegetation communities of concern (note: vegetation communities are key criteria for designation of ESAs and ANSIs)	Different Alternatives have varying levels of impact on vegetation communities of concern. Vegetation communities provide habitat for both flora and fauna species.	No mitigation measures identified as this Indicator measures the quantity of habitat lost and the area lost has been minimized to the extent possible through design.	MP = No negative impacts, potential for positive impacts on vegetation communities of conservation concern P = No negative impacts IP = Some negative impacts LP = Most negative impacts
	Potential for impact on terrestrial Species at Risk (SAR)	Potential effects to habitat for Bank Swallow	Potential terrestrial SAR present in the Study Area include Bank Swallows. Alternatives that benefit SAR and minimize negative impacts will be preferred.	No mitigation measures identified as this Indicator measures the quantity of habitat lost and the area lost has been minimized to the extent possible through design.	MP = Least degree of or no impacts on SAR P = Intermediate degree of impacts on SAR IP = Higher degree of impacts on SAR LP = Highest degree of impacts on SAR

Table 5-1: Criteria and Indicators Considered for the Comparative Evaluation

Objectives	Criteria	Indicators	Indicator Definitions	Mitigation	Ranking Measures
Manage public safety and property risk	Ability to minimize public safety risk and property loss as a result of slope erosion/failure	Ability to provide a trail lakeward of risk line along the shoreline and shoreward of the risk line along the top of the bluff	Bluff erosion processes can result in slope failure (e.g., landslide). The improvement of existing trails and development of new trails along the toe/top of the slope could result in public safety risks as a result of the potential for slope failure. Alternatives that better accommodate this risk are more preferred.	No mitigation measures identified as this Indicator measures the relative safety of the trail for each Alternative.	MP = Provides the highest degree of safe formal public access P = Provides a relatively high degree of safe formal public access IP = Provides an intermediate degree of safe formal public access LP = Provides the lowest degree of safe formal public access
		Ability to address the potential loss of public property and infrastructure as a result of slope erosion/failure (slope crest migration)	Bluff erosion processes can result in slope failure (e.g., landslide), including loss of tableland and erosion of the bluff face. There are varying levels of risk for slope failure within the Study Area which can impact public property and infrastructure.	No mitigation measures identified as this Indicator measures the relative ability of each Alternative to eliminate public safety risk.	MP = Alternative eliminates risk to public property and infrastructure P = Alternative is associated with risk to public property only IP = Alternative is associated with risk to open space and public recreational amenities LP = Alternative is associated with risk to public property and infrastructure
	Improve Emergency Services access to the waterfront	Ability to provide additional Emergency Services access along the waterfront	Currently Emergency Services vehicle access to the shoreline is largely limited to Bluffer's Park along Brimley Road; the shoreline between Meadowcliffe and Grey Abbey along the Guild construction access route; and to the tablelands at East Point Park. Alternatives which provide opportunity for additional Emergency Services vehicle access along the entire shoreline Segments are more preferred.	No mitigation measures identified as this Indicator measures the relative ability of each Alternative to provide Emergency Services access. Increasing access is achieved by using another Alternative.	MP = Allows for all vehicles to access entire Segment P = Allows for some access to entire Segment IP = Allows for limited access LP = Does not allow access beyond existing extent of access
		Ability to protect source water protection areas	Potential for impacts on water quality at water intake pipe locations	Water supply intake pipe locations are considered as source water protection areas by the Province. Water quality within these source water protection areas cannot be negatively impacted.	No mitigation measures identified as water quality impacts of shore protection works are a product of changes to coastal processes, which cannot be altered through mitigation.
Provide an enjoyable waterfront experience	Improve public access to the waterfront	Potential to provide continuous formal public access along the shoreline	Various planning documents identify a trail along the water's edge as a long-term objective. The Project considers a trail along the shoreline that includes both top and toe of the Bluffs. Improved public access along the shoreline includes consideration for increased formal public access and continuous connections. Alternatives which are better able to provide continuous formal public access along the water's edge are preferred.	No mitigation measures identified. Indicator measures degree to which continuous formal public access is achieved and cannot be altered through mitigation.	MP = Provides for continuous formal public access along the entire Segment P = Provides for continuous formal public access along a large portion of the Segment IP = Provides for continuous formal public access along a small portion of the Segment LP = Provides the least amount of continuous formal public access along the Segment
		Ability to accommodate a primary to high-capacity multi-use trail (width)	Within the Greater Toronto Area, the Waterfront Trail experiences significant demand, and user conflicts along shared paths have been reported. The provision of a primary to high-capacity multi-use trail is recognized as an opportunity to alleviate these pressures. While existing physical and environmental constraints may limit the ability to accommodate such a trail, Alternatives which provide the greatest opportunity for a primary or high-capacity multi-use trail outside the risk line within the Segment are preferred.	No mitigation measures identified. Indicator measures degree to which primary to high-capacity multi-use trail (width) is achieved and cannot be altered through mitigation.	MP = Accommodates a multi-use trail that meets primary trail to high-capacity standard within the entire Segment P = Accommodates a multi-use trail, where only a small portion does not meet primary to high-capacity trail standard IP = Accommodates a multi-use trail, where a medium to large portion does not meet primary to high-capacity trail standard LP = Accommodates a multi-use trail, where the largest portion does not meet primary to high-capacity trail standards; or does not accommodate a primary to high-capacity multi-use trail

Table 5-1: Criteria and Indicators Considered for the Comparative Evaluation

Objectives	Criteria	Indicators	Indicator Definitions	Mitigation	Ranking Measures
		<ul style="list-style-type: none"> Ability to meet AODA grade standard 	<ul style="list-style-type: none"> Improved access along the shoreline includes opportunities to provide physical AODA accessibility. Alternatives which are better able to accommodate a suitable grade are preferred. 	<p>Mitigation includes the use of level rest areas on steep slopes where possible. However, it is noted that while this helps it does not achieve suitable grades.</p>	<p>MP = Potential to meet AODA grade standard along full length P = Potential to meet AODA grade standard along most of the length IP = AODA grade standard met along least of the length LP = AODA grade standard cannot be met</p>
		<ul style="list-style-type: none"> Ability to provide formal direct public access to the water 	<ul style="list-style-type: none"> The public desires opportunities for direct access to the water. Alternatives that provide direct access to the water are more preferred. 	<p>Access to the water is a product of the type of shoreline protection works being proposed. As such there is no mitigation identified.</p>	<p>MP = Provides formal direct access to the water over the greatest length P = Provides formal direct access to the water over second-greatest distance IP = Provides formal direct access to the water over the second-shortest distance LP = Does not provide for formal direct access to the water, or provides the least amount of direct access</p>
	<ul style="list-style-type: none"> Potential for changes to the use of the waterfront for recreation 	<ul style="list-style-type: none"> Potential for change in character of sandy shorelines 	<ul style="list-style-type: none"> The existing sand beach at Bluffer’s Park and sandy shoreline at East Point Park are valued by the public. Negative impacts and changes to the character of these shorelines are to be minimized, and Alternatives that achieve this and provide opportunities for enhancement will be considered preferred. 	<p>The potential for change in the character of sandy shorelines is a product of the type of shoreline protection works being proposed. As such there is no mitigation identified.</p>	<p>MP = No negative impact anticipated to the character of existing sand shoreline, with opportunities for enhancements P = No negative impact to character of existing sand shoreline IP = Minor negative impact to character of existing sand shoreline LP = Significant negative impact to character of existing sand shoreline</p>
		<ul style="list-style-type: none"> Potential impacts to the Blue Flag Beach at Bluffer’s Park 	<ul style="list-style-type: none"> Water quality is one of many criteria considered in the designation of a Blue Flag Beach. Impacts and changes to the water quality at Bluffer’s Park Blue Flag Beach are to be avoided, and Alternatives that achieve this will be considered most preferred. 	<p>Changes to water quality affecting the Blue Flag Beach at Bluffer’s Park is a product of the shoreline protection works being proposed throughout the Study Area. As such there is no mitigation identified.</p>	<p>MP = No potential to increase the number of beach closures per season LP = Potential to increase the number of beach closures</p>
		<ul style="list-style-type: none"> Potential for impact on navigation and boating infrastructure 	<ul style="list-style-type: none"> Changes or modifications of sediment supply or sediment transport may impact navigational depths and/or dredging requirements of existing boating facilities at Bluffer’s Park. Alternatives that minimize sediment supply will be preferred. 	<p>Change to navigation and boating infrastructure is a product of the shoreline protection works being proposed throughout the Study Area. As such there is no mitigation identified.</p>	<p>MP = High Potential to reduce sedimentation and therefore dredging requirements in the entrance to Bluffer’s Park boat basin P = Medium potential to reduce sedimentation IP = Low potential to reduce sedimentation LP = No potential to reduce sedimentation</p>
Consistency and co-ordination with other initiatives	<ul style="list-style-type: none"> Ability to integrate with City and other agency plans and initiatives 	<ul style="list-style-type: none"> Ability to integrate with new and proposed plans or initiatives 	<ul style="list-style-type: none"> There are many plans and initiatives underway within the Study Area including for example: Metrolinx Regional Express Rail (RER) Program. The Alternatives will need to integrate, and accommodate these other initiatives. Alternatives that can best accommodate these plans/initiatives will be preferred. 	<p>No mitigation identified.</p>	<p>MP = Provides highest ability to accommodate other plans and initiatives P = Provides opportunity to accommodate other plans and initiatives IP = Provides intermediate opportunity to accommodate other plans and initiatives LP = Provides the least opportunity to accommodate other plans and initiatives</p>
		<ul style="list-style-type: none"> Consistency with the goals of the Fish Community Objectives for Lake Ontario 	<ul style="list-style-type: none"> The Fish Community Objectives for Lake Ontario were created to maintain and increase target fish species in Lake Ontario. Alternatives which are able to advance these objectives are more preferred. 	<p>No mitigation identified.</p>	<p>MP = Provides additional contributions to the advancement of applicable objectives LP = Does not provide additional contributions to the advancement of applicable objectives</p>

Table 5-1: Criteria and Indicators Considered for the Comparative Evaluation

Objectives	Criteria	Indicators	Indicator Definitions	Mitigation	Ranking Measures
		<ul style="list-style-type: none"> Consistency with the goals and objectives of the Management Plan for Guild Park and Gardens 	<ul style="list-style-type: none"> Significant community planning has occurred for the Guild Park and Gardens site. The Management Plan was developed to provide a framework to guide the management of the site. Alternatives which best advance the framework of the Management Plan are more preferred. 	No mitigation identified.	MP = Most consistent with the Guild Park and Gardens Management Plan P = Consistent with the Guild Park and Gardens Management Plan (meets most objectives) IP = Consistent with the Guild Park and Gardens Management Plan (meets some objectives) LP = Least consistent with the Guild Park and Gardens Management Plan (does not meet any objectives)
		<ul style="list-style-type: none"> Consistency with the objectives of Bikeway Trails Implementation Plan 	<ul style="list-style-type: none"> The 2016 Draft 10-Year Bike Plan identifies implementation priorities. Priorities for the Project Study Area include: water's edge connection from Bluffer's Park to Morningside, and opportunities for water's edge connection from Morningside Avenue to Port Union. 	No mitigation identified.	MP = Consistent with the objectives of the Bikeway Trails Implementation Plan LP = Not consistent with the objectives of the Bikeway Trails Implementation Plan
		<ul style="list-style-type: none"> Consistency with the Integrated Shoreline Management Plan (ISMP) 	<ul style="list-style-type: none"> The 1996 ISMP identified a series of recommendations for the Project Area. 	No mitigation identified.	MP = Consistent with the objectives of the ISMP LP = Not consistent with the objectives of the ISMP
	<ul style="list-style-type: none"> Compatibility with existing land uses 	<ul style="list-style-type: none"> Compatibility with existing land use (industrial) 	<ul style="list-style-type: none"> Industrial land uses exist within the Project Study Area. Alternatives which minimize impacts on existing industrial areas are more preferred. 	No mitigation identified.	MP = Most compatible with existing industrial land use P = Compatible with existing industrial land use IP = Somewhat compatible with existing industrial land use LP = Least compatible with existing industrial land use
		<ul style="list-style-type: none"> Compatibility with existing land use (residential) 	<ul style="list-style-type: none"> Residential land uses exist within the Project Study Area. Alternatives which minimize impacts on existing residential areas are more preferred. 	No mitigation identified.	MP = Most compatible with existing residential land use P = Compatible with existing residential land use IP = Somewhat compatible with existing residential land use LP = Least compatible with existing residential land use
	<ul style="list-style-type: none"> Potential impact on archaeological resources, built heritage resources, and cultural heritage landscapes 	<ul style="list-style-type: none"> Potential to impact known or potential archaeological resources 	<ul style="list-style-type: none"> Impacts to archaeological resources (terrestrial and/or marine) need to be minimized or mitigated. Alternatives that best achieve this will be considered as preferred. 	Where possible archaeological resources have been avoided as part of Project design. Should a resource be affected, mitigation by conservation, documentation or in situ protection would be undertaken.	MP = Will not impact any known or potential archaeological resources P = Low potential to impact archaeological resources but mitigation would be possible IP = Moderate potential to impact archaeological resources but mitigation would be possible LP = Will impact archaeological resources and cannot be effectively mitigated
		<ul style="list-style-type: none"> Potential for impact on traditional land uses and valued cultural features 	<ul style="list-style-type: none"> It is important to recognize any features or areas in the Study Area that have traditional/cultural importance to First Nation communities. Further, opportunities to celebrate these features and educate the public about them will be explored. Alternatives that best achieve this will be preferred. 	No mitigation identified.	MP = Will not impact traditional land uses and valued cultural features P = Low potential to impact traditional land uses and valued cultural features IP = Moderate potential to impact traditional land uses and valued cultural features LP = Will impact traditional land uses and valued cultural features

Table 5-1: Criteria and Indicators Considered for the Comparative Evaluation

Objectives	Criteria	Indicators	Indicator Definitions	Mitigation	Ranking Measures
		<ul style="list-style-type: none"> Potential to impact known built heritage resources, and cultural heritage landscapes 	<ul style="list-style-type: none"> Impacts to built heritage resources and cultural heritage landscapes need to be minimized. Alternatives that best achieve this will be considered as preferred. 	Where possible heritage resources have been avoided as part of Project design. Should a resource be affected, mitigation by conservation, documentation or in situ protection would be undertaken.	MP = Will not impact known built heritage resources and cultural heritage landscapes P = Low potential to impact known built heritage resources and cultural heritage landscapes IP = Moderate potential to impact known built heritage resources and cultural heritage landscapes LP = Will impact known built heritage resources and cultural heritage landscapes
Achieve value for cost	Estimated capital cost	Estimated cost to construct (relative to each other)	High level relative costs for the Alternatives have been developed. Less expensive Alternatives will be scored higher.	No mitigation identified	MP = Lowest construction cost P = Low intermediate construction cost IP = High intermediate construction cost LP = Highest construction cost
		Potential amount of water lot and property acquisition required (relative to each other)	Some Alternatives could require Crown water lots (measured between the outmost extent of the Alternative and the shoreline), private property and/or easements across private property. Alternatives that minimize impacts to Crown water lots and private property are Preferred.	No mitigation identified	MP = Will not require private property or Crown water lots P = Will require the least amount of private property parcels and/or Crown water lots IP = Will require a greater amount of private property parcels and/or Crown water lots LP = Will require the greatest amount of private property parcels and/or Crown water lots
	Maintenance and operations costs	Relative maintenance and operation costs of the shoreline and erosion works	Alternatives that would be expected to have lower maintenance and operations cost would be preferred.	No mitigation identified.	MP = Lowest maintenance and operations costs P = Low intermediate maintenance and operation costs IP = High intermediate maintenance and operation costs LP = Highest maintenance and operation costs

Table 5-2: Criteria and Indicators Screened Out by Segment and Rationale for the Screening

Segment	Objective	Criteria	Indicator	Rationale	
All	Manage public safety and property risk	Ability to protect source water protection areas	Potential for impacts on water quality at water intake pipe locations	Same for all Alternatives. There were no impacts to the water quality at the F.J. Horgan WTP intake pipes.	
	Consistency and co-ordination with other initiatives	Ability to integrate with City and other agency plans and initiatives	Consistency with the objectives of Bikeway Trails Implementation Plan	Same for all Alternatives.	
			Consistency with the Integrated Shoreline Management Plan	Same for all Alternatives.	
		Potential impact on archaeological resources, built heritage resources, and cultural heritage landscapes	Potential for impact on traditional land uses and valued cultural features	Same for all Alternatives.	
			Potential to impact known built heritage resources, and cultural heritage landscapes	Same for all Alternatives. There are no impacts to the built heritage resources and cultural heritage landscapes within the Project Study Area.	
West	Protect and enhance terrestrial and aquatic natural features and linkages	Potential for impact on terrestrial Species at Risk (SAR)	Potential effects to habitat for Bank Swallow	Same for all West Segment Alternatives. None of the proposed Alternatives, including the “Do Nothing”, are anticipated to have a direct impact on Bank Swallow habitat, as the Bluffs below Cudia Park will naturally undergo self-stabilization within the next 100 years. Therefore, the quantity of Bank Swallow habitat will likely be reduced through increased vegetation for all Alternatives; however, habitat will not be eliminated and Bank Swallows will continue to nest in the unvegetated parts of the bluff face.	
	Manage public safety and property risk	Ability to minimize public safety risk and property loss as a result of slope erosion/failure	Ability to address the potential loss of public property and infrastructure as a result of slope erosion/failure (slope crest migration)	No risk to public property or infrastructure in this Segment.	
	Consistency and co-ordination with other initiatives	Ability to integrate with City and other agency plans and initiatives	Ability to integrate with new and proposed plans or initiatives	No new initiatives in West Segment.	
			Consistency with the goals and objectives of the Management Plan for Guild Park and Gardens	Not applicable.	
		Compatibility with existing land uses	Compatibility with existing land use (industrial)	Not applicable.	
			Compatibility with existing land use (residential).	Not applicable.	
	Potential impact on archaeological resources, built heritage resources, and cultural heritage landscapes	Potential to impact known or potential archaeological resources	No identified resources in West Segment.		
	Central	Protect and enhance terrestrial and aquatic natural features and linkages	Potential for impact on terrestrial Species at Risk	Potential effects to habitat for Bank Swallow	Same for all Central Segment Alternatives. No change to existing conditions.
		Manage public safety and property risk	Ability to minimize public safety risk and property loss as a result of slope erosion/failure	Ability to address the potential loss of public property and infrastructure as a result of slope erosion/failure (slope crest migration)	Existing shoreline protection structures across the Central Segment have previously addressed this risk
			Improve Emergency Services access to the waterfront	Ability to provide additional Emergency Services access along the waterfront	Same for all Central Segment Alternatives.
Provide an enjoyable waterfront experience		Potential for changes to the use of the waterfront for recreation	Potential for change in character of sandy shorelines	Not applicable.	
			Potential impacts to the Blue Flag Beach at Bluffer’s Park	Same for all Alternatives.	
			Potential for impact on navigation and boating infrastructure	Same for all Alternatives.	
Consistency and co-ordination with other initiatives		Ability to integrate with City and other agency plans and initiatives	Ability to integrate with new and proposed plans or initiatives	Not applicable.	
			Consistency with the goals and objectives of the Management Plan for Guild Park and Gardens	Same for all Central Segment Alternatives.	
		Compatibility with existing land uses	Compatibility with existing land use (industrial)	Not applicable.	
			Compatibility with existing land use (residential)	Not applicable.	
East	Provide an enjoyable waterfront experience	Potential for changes to the use of the waterfront for recreation	Potential impacts to the Blue Flag Beach at Bluffer’s Park	Same for all Alternatives.	
			Potential for impact on navigation and boating infrastructure	Same for all Alternatives.	
	Consistency and co-ordination with other initiatives	Ability to integrate with City and other agency plans and initiatives	Consistency with the goals and objectives of the Management Plan for Guild Park and Gardens	Not applicable.	

The evaluation of “Alternative Methods” was structured to assess the ability of each Alternative to meet the Project Vision and Objectives through a comparison of the net effects associated with operation/establishment of the Alternative. As an overriding goal, the Preferred Alternative is to result in an overall net benefit over the “Do Nothing” Alternative to the environment and community. Given the conceptual level of detail associated with each Alternative, mitigation of operation/establishment effects includes avoidance of negative effects (e.g., loss of terrestrial and aquatic habitats, impacts to built heritage, cultural heritage or archaeological resources, etc.) through design, where possible. Table 5-1 details the mitigation considered for each Indicator. For the purpose of this evaluation, the effects associated with construction (e.g., sedimentation, traffic, dust, noise, changes to access and use, etc.) were considered to be similar for each Alternative and generally could be mitigated using standard construction best management practices (see **Appendix H**). As construction effects did not help to distinguish among the Alternatives, the net effects from construction were not included in the evaluation.

Once the Effects Assessment was completed, the Alternatives were ranked relative to each other on the basis of the following scale: Most Preferred, Preferred, Intermediate Preferred, and Least Preferred. The rationale for each level of ranking for each Indicator is presented in **Table 5-1** above. In determining the relative rankings of the Alternatives for each Indicator the following was considered: the sensitivity of the affected feature, the potential to mitigate/enhance the effect, and the confidence level of the assessment. If the differences among the Alternatives were identified to be small, the Alternatives were rated similar or the same.

The full and complete results of the Effects Assessment and ratings are presented in **Appendix F**. Separate evaluation tables were prepared for each of the three Project Area Segments.

5.4.1.3 Comparative Evaluation

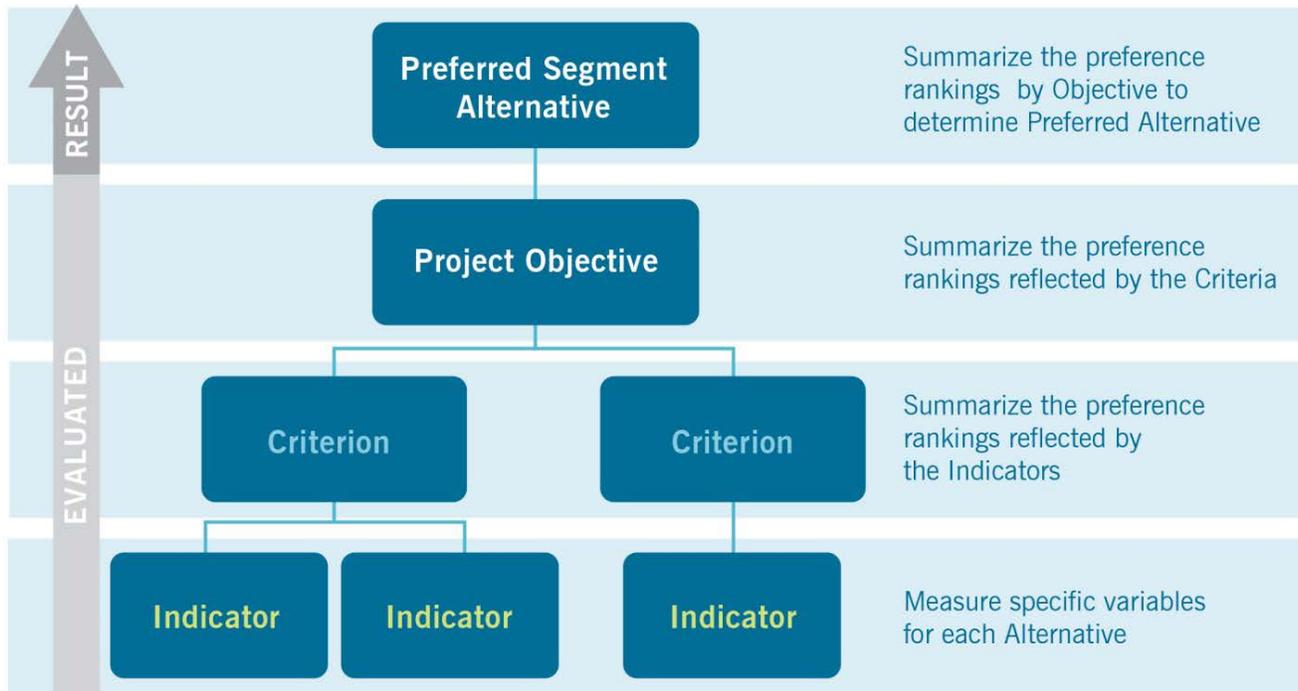
The comparative evaluation of the Alternatives was completed through a comprehensive and rational process for which all Objectives, Criteria and Indicators are of equal importance. Considering the Effects Assessment results, the first step involved the “rolling-up” of the Indicator-level rankings to an overall Criteria-level ranking. In some cases trade-offs, making a rational decision to accept some negative effects to achieve an overall benefit, were made to rationalize preference rankings by Criteria. Next, the Criteria-level rankings were then “rolled-up” to determine preference rankings at the Objective level. The final step of the evaluation process was to determine the overall Preferred Alternative by considering the preference rankings by the five Project Objectives and by discussing the relative advantages and disadvantages of each Alternative. **Figure 5-25** illustrates this process.

Each of these evaluation steps required trade-offs to be made to determine the preference rankings. The results of the Indicator-level, Criteria-level and Objective-level preference rankings are presented in **Appendix F**.

For each of the Project Area Segments, the following report sections describe the rationale for the Alternative preference ranking by Project Objective within each Project Area Segment. These descriptions of the evaluation results draws on the detailed information presented in **Appendix F** as

well as the input received from Stakeholders and the public at and following PIC #2 which presented the draft evaluation results.

Figure 5-25: Alternatives Comparative Evaluation Process



5.4.2 Evaluation Results – West Segment

The following presents the comparative evaluation results for the West Segment. The evaluation is organized by Project Objective and presents the trade-offs that were made considering the Alternative assessment results, and advantages and disadvantages, as detailed in **Appendix F**. The discussion of effects assumes that mitigation measures have been applied to address any potential effects and that construction effects and mitigation measures are common to all Alternatives. Nine Alternatives including the “Do Nothing” Alternative were assessed in the West Segment as described previously in **Section 5.3.1**.

5.4.2.1 Objective 1: Protect and Enhance Terrestrial and Aquatic Natural Features and Linkages

The Criteria and Indicators for this Objective measure the ability of each Alternative to protect existing natural features and enhance or create new habitat and ecological linkages. For this Objective, the following Criteria were considered:

- Extent of Aquatic Habitat Enhanced or Diminished; and,
- Extent of Terrestrial Habitat Attributes Enhanced or Diminished.

Table 5-3 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 1. A more detailed evaluation table is provided in **Appendix F**.

Regarding the Criterion *Extent of Aquatic Habitat Enhanced or Diminished*, the Alternatives ranked Preferred included: Alternative 1 (Headland Beach), Alternative 3A (Short Span Island-Bridge), and Alternative 5B (Wide Beach). Alternative 1 provides the greatest increase to shoreline substrate type diversity through a moderate reduction in sand supplemented by a high increase in cobble and moderate increase in armourstone (boulder). Alternative 3A and Alternative 5B provide the greatest positive change to shoreline morphology through high increases in shoreline irregularity. The changes associated with Alternative 1, Alternative 3A and Alternative 5B provide the greatest opportunities for enhancement that will benefit both resident and migratory fish, relative to the other Alternatives. No Alternatives were ranked as Most Preferred with respect to this Criterion. Although the “Do Nothing” Alternative results in no fill, this is the only Alternative that provides no improvement to shoreline morphology or shoreline substrate type diversity.

Concerning the Criterion *Extent of Terrestrial Habitat Attributes Enhanced or Diminished*, the Alternatives ranked Most Preferred included: Alternative 5A (Narrow Beach) and Alternative 5B (Wide Beach) as these Alternatives provide potential for the expansion of existing sand dune communities (by enlarging the existing sand beach) and result in enhancing the existing land-water interface to the greatest extent. Alternative 1 (Headland Beach) and the “Do Nothing” Alternative were ranked as Preferred. Alternative 1 (Headland Beach) provides the second-greatest enhancement to the existing land-water interface. The “Do Nothing” Alternative is not anticipated to have any negative impacts on vegetation communities of concern. However, with the “Do Nothing” Alternative, there are no opportunities for vegetation community of concern enhancement (i.e., sand dune expansion).

Considering the above Criteria-level rankings, the Most Preferred Alternative for Objective 1 was Alternative 5B (Wide Beach) as this Alternative provides one of the best opportunities for aquatic habitat enhancement through increases in shoreline profile morphology, some increase in shoreline substrate type diversity, and has the greatest potential to enhance the land-water interface. Alternative 5B also provides the opportunity for sand dune vegetation community expansion to the greatest extent.

5.4.2.2 Objective 2: Manage Public Safety and Property Risk

The Criteria and Indicators for this Objective measure the ability of each Alternative to manage public safety and property risk. For this Objective, the following Criteria were considered:

- Ability to Minimize Public Safety Risk and Property Loss as a Result of Slope Erosion/Failure; and,
- Improve Emergency Services Access to the Waterfront.

Table 5-4 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 2. A more detailed evaluation table is provided in **Appendix F**.

Table 5-3: West Segment, Objective 1 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1 ²	Alternative 2A ³	Alternative 2B ⁴	Alternative 3A ⁵	Alternative 3B ⁶	Alternative 4 ⁷	Alternative 5A ⁸	Alternative 5B ⁹
Protect and enhance terrestrial and aquatic natural features and linkages	Extent of aquatic habitat enhanced or diminished	<ul style="list-style-type: none"> Ability to increase shoreline morphology by increasing shoreline irregularity Ability to increase shoreline substrate type diversity Potential for aquatic habitat loss or modification 	Intermediate Preferred No fill, but no improvement in morphology or substrate type diversity, relative to the other Alternatives.	Preferred High amount of fill (40,000 m ²). Increase in morphology through a 30% increase in shoreline irregularity. Greatest improvement to shoreline substrate type diversity through a high increase in cobble and a moderate increase in boulder proportions, relative to the previously existing sand-dominated substrate.	Intermediate Preferred Minor amount of fill. No increase in morphology as shoreline irregularity remains the same. No improvement to shoreline substrate type diversity.	Intermediate Preferred Minor amount of fill. No increase in morphology as shoreline irregularity remains the same. No improvement to shoreline substrate type diversity.	Preferred Moderate amount of fill (12,000 m ²). Highest increase in morphology through a 60% increase in shoreline irregularity. Some improvement to shoreline substrate type diversity through a moderate increase in boulder proportions, relative to the previously existing sand-dominated substrate.	Intermediate Preferred Moderate amount of fill (9,000 m ²). Increase in morphology through a 40% increase in shoreline irregularity. Some improvement to shoreline substrate type diversity through a moderate increase in boulder proportions, relative to the previously existing sand-dominated substrate.	Intermediate Preferred Moderate amount of fill (15,000 m ²). No increase in morphology, as shoreline irregularity remains the same. Some improvement to shoreline substrate type diversity through a moderate increase in boulder proportions, relative to the previously existing sand-dominated substrate.	Intermediate Preferred High amount of fill (49,000 m ²). Increase in morphology through a 30% increase in shoreline irregularity. Some improvement to shoreline substrate type diversity through a moderate increase in boulder proportions, relative to the previously existing sand-dominated substrate.	Preferred Highest amount of fill (109,000 m ²). Second-highest increase in morphology through a 50% increase in shoreline irregularity. Some improvement to shoreline substrate type diversity through a moderate increase in boulder proportions, relative to the previously existing sand-dominated substrate.
	Extent of terrestrial habitat attributes enhanced or diminished	<ul style="list-style-type: none"> Potential to create appropriate land-water interface Impact to vegetation communities of concern 	Preferred No improvement to land-water interface. No impacts to vegetation communities of concern.	Preferred Positive changes to land-water interface through a 15% increase in shoreline length that provides a land-water interface that is always out of the water. Moderate temporary impacts to ~3,500 m ² of beach vegetation communities of concern.	Intermediate Preferred No improvement to land-water interface. Low temporary impacts to ~400 m ² of beach vegetation communities of concern.	Intermediate Preferred No improvement to land-water interface. Low temporary impacts to ~400 m ² of beach vegetation communities of concern.	Intermediate Preferred No improvement to land-water interface. Low temporary impacts to ~300 m ² of beach vegetation communities of concern.	Intermediate Preferred No improvement to land-water interface. Low temporary impacts to ~200 m ² of beach vegetation communities of concern.	Least Preferred Negative change in land-water interface through a 20% reduction in shoreline length that provides a land-water interface that is always out of water. Greatest permanent negative impacts (i.e., loss) to ~2,300 m ² of beach vegetation communities of concern.	Most Preferred Greatest improvement to land-water interface through a 30% increase in shoreline length that provides a land-water interface that is always out of the water. Alternative provides potential for expansion of existing sand dune communities (by enlarging existing sand beach).	Most Preferred Greatest improvement to land-water interface through a 30% increase in shoreline length that provides a land-water interface that is always out of water. Alternative provides potential for expansion of existing sand dune communities (by enlarging existing sand beach).
Objective-Level Ranking			Intermediate Preferred	Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Least Preferred	Preferred	Most Preferred

Notes: 1. Existing Conditions 4. Long Span Bridge 7. Causeway
 2. Headland Beach 5. Short Span Island-Bridge 8. Narrow Beach
 3. Short Span Bridge 6. Long Span Island-Bridge 9. Wide Beach

Table 5-4: West Segment, Objective 2 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1 ²	Alternative 2A ³	Alternative 2B ⁴	Alternative 3A ⁵	Alternative 3B ⁶	Alternative 4 ⁷	Alternative 5A ⁸	Alternative 5B ⁹
Manage public safety and property risk	Ability to minimize public safety risk and property loss as a result of slope erosion/failure	<ul style="list-style-type: none"> Ability to provide a trail lakeward of risk line along the shoreline and shoreward of the risk line along the top of the bluff 	Least Preferred Cannot effectively minimize public safety risk.	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line).	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line).	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line).	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line).	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line).	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line).	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line).	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line).
	Improve Emergency Services access to the waterfront	<ul style="list-style-type: none"> Ability to provide additional Emergency Services access along the waterfront 	Least Preferred Provides no access beyond east parking lot at Bluffer's Park.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.
Objective-Level Ranking			Least Preferred	Most Preferred	Most Preferred	Most Preferred	Most Preferred	Most Preferred	Most Preferred	Most Preferred	Most Preferred

Notes: 1. Existing Conditions 4. Long Span Bridge 7. Causeway
 2. Headland Beach 5. Short Span Island-Bridge 8. Narrow Beach
 3. Short Span Bridge 6. Long Span Island-Bridge 9. Wide Beach

Regarding the Criterion *Ability to Minimize Public Safety Risk and Property Loss as a Result of Slope Erosion/Failure*, all the Alternatives, except the “Do Nothing” Alternative, were ranked Most Preferred as these Alternatives effectively minimize risk to public safety by allowing the development of a trail outside of the risk line.

Regarding the Criterion *Improve Emergency Services Access to the Waterfront*, all of the Alternatives, except the “Do Nothing” Alternative, were ranked as Most Preferred as all would permit Emergency Services vehicle access along the full length of the Shoreline Segment.

Considering the above Criteria-level rankings, all the Alternatives, except the “Do Nothing” Alternative, were the highest ranked Alternatives for Objective 2. Key benefits of these Alternatives include the minimization of public safety risk, and provision of full Emergency Services access.

5.4.2.3 Objective 3: Provide an Enjoyable Waterfront Experience

The Criteria and Indicators for this Objective measure the extent to which each Alternative provides an enjoyable waterfront experience. For this Objective, the following Criteria were considered:

- Improve Public Access to the Waterfront; and,
- Potential for Changes to the Use of the Waterfront for Recreation.

Table 5-5 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 3. A more detailed evaluation table is provided in **Appendix F**.

For the Criterion *Improve Public Access to the Waterfront*, the Alternatives ranked Most Preferred included: Alternatives 1 (Headland Beach), 5A (Narrow Beach) and 5B (Wide Beach) as these Alternatives provide access along the water’s edge, space for a primary to high-capacity multi-use trail, and safe, improved formal direct access to the water.

With respect to *Potential for Changes to the Use of the Waterfront for Recreation*, Alternatives 5A (Narrow Beach) and 5B (Wide Beach) were ranked as Most Preferred as the existing Bluffer’s Park Beach would be enhanced, and sediment supply and alongshore sediment transport will be eliminated, improving navigation conditions at the entrance to the Bluffer’s Park boat basin.

Considering the above two Criteria-level rankings, Alternatives 5A (Narrow Beach) and 5B (Wide Beach) were ranked as Most Preferred as they were ranked Most Preferred for both Criteria (*Improve Public Access to the Waterfront* and *Potential for Changes to the Use of the Waterfront for Recreation*).

5.4.2.4 Objective 4: Consistency and Co-ordination with Other Initiatives

The Criteria and Indicators for this Objective measure the extent to which the Alternatives are consistent and co-ordinated with other initiatives or plans in the Study Area. For this Objective, only one Criterion was considered as all the others were screened out because there were no differences between the Alternatives:

- Ability to Integrate with City and Other Agency Plans and Initiatives.

Table 5-5: West Segment, Objective 3 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1 ²	Alternative 2A ³	Alternative 2B ⁴	Alternative 3A ⁵	Alternative 3B ⁶	Alternative 4 ⁷	Alternative 5A ⁸	Alternative 5B ⁹
Provide an enjoyable waterfront experience	Improve public access to the waterfront	<ul style="list-style-type: none"> Potential to provide continuous formal public access along the shoreline Ability to accommodate a primary to high-capacity multi-use trail (width) Ability to meet AODA grade standard Ability to provide formal direct public access to the water 	Least Preferred Does not provide continuous access along water's edge or space for a multi-use trail. AODA grade requirements cannot be met east of the existing beach. Provides a moderate amount of formal direct public access to the water along ~45% of the existing shoreline (Bluffer's Park Beach).	Most Preferred Provides continuous access along the water's edge and space for a multi-use trail. AODA grade requirements can be met. The length of shoreline that provides formal direct access to the water is increased by 20%.	Preferred Provides continuous access along the water's edge and space for a multi-use trail. AODA grade requirements can be met. No change to the length of shoreline that provides formal direct access to the water.	Preferred Provides continuous access along the water's edge and space for a multi-use trail. AODA grade requirements can be met. No change to the length of shoreline that provides formal direct access to the water.	Preferred Provides continuous access along the water's edge and space for a multi-use trail. AODA grade requirements can be met. No change to the length of shoreline that provides formal direct access to the water.	Preferred Provides continuous access along the water's edge and space for a multi-use trail. AODA grade requirements can be met. No change to the length of shoreline that provides formal direct access to the water.	Intermediate Preferred Provides continuous access along the water's edge and space for a multi-use trail. AODA grade requirements can be met. No change to the length of shoreline that provides formal direct access to the water.	Most Preferred Provides continuous access along the water's edge and space for a multi-use trail. AODA grade requirements can be met. The length of shoreline that provides formal direct access to the water is increased by 40%.	Most Preferred Provides continuous access along the water's edge and space for a multi-use trail. AODA grade requirements can be met. The length of shoreline that provides formal direct access to the water is increased by 40%.
	Potential for changes to the use of the waterfront for recreation	<ul style="list-style-type: none"> Potential for change in character of sandy shorelines Potential impacts to the Blue Flag Beach at Bluffer's Park Potential for impact on navigation and boating infrastructure 	Preferred No negative impact to character of existing sand beach or changes to existing conditions. No change to alongshore sediment transport, with gradual reductions in sediment supply.	Preferred Greatest physical impact on existing beach with a ~40% reduction in sand beach length, but provides approximately ~500 m of new cobble shoreline. No change to alongshore sediment transport, but sediment supply will be eliminated, thus improving navigation.	Intermediate Preferred Minor impact to existing beach with a ~1% reduction in sand beach length. Sediment supply will be reduced very gradually, with negligible change to alongshore sediment transport, resulting in minimal change to navigation.	Intermediate Preferred Minor impact to existing beach with a ~1% reduction in sand beach length. Sediment supply will be reduced very gradually, with negligible change to alongshore sediment transport, resulting in minimal change to navigation.	Intermediate Preferred Minor impact to existing beach with a ~5% reduction in sand beach length. Sediment supply will be reduced gradually, with little change to alongshore sediment transport, resulting in minimal change to navigation.	Intermediate Preferred Minor impact to existing beach with a ~5% reduction in sand beach length. Sediment supply will be reduced gradually, with little change to alongshore sediment transport, resulting in minimal change to navigation.	Intermediate Preferred Minor impact to existing beach with a ~5% reduction in sand beach length. Sediment supply will be reduced gradually, with little change to alongshore sediment transport, resulting in minimal change to navigation.	Intermediate Preferred Second greatest impact on existing beach with a ~30% reduction in sand beach length and potential for beach closures due to water quality changes. Sediment supply will be reduced gradually, with no change to alongshore sediment transport, resulting in minimal change to navigation.	Most Preferred Provides greatest enhancement to existing sand beach with a ~40% increase in sand beach length. Sediment supply and alongshore sediment transport will be eliminated, thus improving navigation.
Objective-Level Ranking			Intermediate Preferred	Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Most Preferred	Most Preferred

Notes: 1. Existing Conditions 4. Long Span Bridge 7. Causeway
 2. Headland Beach 5. Short Span Island-Bridge 8. Narrow Beach
 3. Short Span Bridge 6. Long Span Island-Bridge 9. Wide Beach

Table 5-6 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 4. A more detailed evaluation table is provided in **Appendix F**.

Considering the Criterion *Ability to Integrate with City and Other Agency Plans and Initiatives*, Alternatives 1 (Headland Beach), 2A (Short Span Bridge), 2B (Long Span Bridge), 3A (Short Span Island-Bridge), 3B (Long Span Island-Bridge), 5A (Narrow Beach), and 5B (Wide Beach) were ranked as Most Preferred as these Alternatives provide additional contributions to the advancement of applicable fish community objectives as a result of the increases in local physical morphology and substrate diversity.

5.4.2.5 Objective 5: Achieve Value for Cost

The Criteria and Indicators for this Objective consider the capital and long-term maintenance and operating costs of the Alternatives. For this Objective, the following Criteria were considered:

- Estimated Capital Cost; and,
- Maintenance and Operations Costs.

Table 5-7 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 5. A more detailed evaluation table is provided in **Appendix F**.

Considering the Criterion *Estimated Capital Cost*, the “Do Nothing” Alternative was ranked as Most Preferred as this Alternative does not involve any infrastructure works. For the Criterion *Maintenance and Operations Costs*, the Alternatives ranked as Preferred included: Alternative 1 (Headland Beach), Alternative 4 (Causeway), Alternative 5B (Wide Beach), and the “Do Nothing” Alternative, as each of these Alternatives are anticipated to have low maintenance costs. No Alternatives were ranked as Most Preferred. Overall the “Do Nothing” Alternative is Most Preferred for this Objective.

Table 5-6: West Segment, Objective 4 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1 ²	Alternative 2A ³	Alternative 2B ⁴	Alternative 3A ⁵	Alternative 3B ⁶	Alternative 4 ⁷	Alternative 5A ⁸	Alternative 5B ⁹
Consistency and co-ordination with other initiatives	Ability to integrate with City and other agency plans and initiatives	<ul style="list-style-type: none"> Consistency with the goals of the Fish Community Objectives for Lake Ontario 	Least Preferred Does not provide additional contributions to the advancement of applicable fish community objectives.	Most Preferred Provides additional contributions to the advancement of applicable fish community objectives.	Most Preferred Provides additional contributions to the advancement of applicable fish community objectives.	Most Preferred Provides additional contributions to the advancement of applicable fish community objectives.	Most Preferred Provides additional contributions to the advancement of applicable fish community objectives.	Most Preferred Provides additional contributions to the advancement of applicable fish community objectives.	Least Preferred Does not provide additional contributions to the advancement of applicable fish community objectives.	Most Preferred Provides additional contributions to the advancement of applicable fish community objectives.	Most Preferred Provides additional contributions to the advancement of applicable fish community objectives.
Objective-Level Ranking			Least Preferred	Most Preferred	Most Preferred	Most Preferred	Most Preferred	Most Preferred	Least Preferred	Most Preferred	Most Preferred

Notes: 1. Existing Conditions 2. Headland Beach 3. Short Span Bridge 4. Long Span Bridge 5. Short Span Island-Bridge 6. Long Span Island-Bridge 7. Causeway 8. Narrow Beach 9. Wide Beach

Table 5-7: West Segment, Objective 5 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1 ²	Alternative 2A ³	Alternative 2B ⁴	Alternative 3A ⁵	Alternative 3B ⁶	Alternative 4 ⁷	Alternative 5A ⁸	Alternative 5B ⁹
Achieve value for cost	Estimated capital cost	<ul style="list-style-type: none"> Estimated cost to construct (relative to each other) Potential amount of water lot and property acquisition required (relative to each other) 	Most Preferred No construction costs. No Crown water lot acquisition.	Preferred Estimated to have higher cost than the "Do Nothing" but lower than Alternatives 2A, 2B, 3B, 5A and 5B. Moderate Crown water lot acquisition required.	Preferred Estimated to have intermediate-high cost. Lower than Alternatives 2B, 5A and 5B. Low Crown water lot acquisition required.	Intermediate Preferred Estimated to have the highest relative cost. Low Crown water lot acquisition required.	Preferred Estimated to have higher cost than the "Do Nothing" but lower than Alternatives 2A, 2B, 3B, 5A and 5B. Moderate Crown water lot acquisition required.	Intermediate Preferred Estimated to have intermediate-high cost. Lower than Alternatives 2B, 5A and 5B. Moderate Crown water lot acquisition required.	Preferred Estimated to have higher cost than the "Do Nothing" but lower than Alternatives 2A, 2B, 3B, 5A and 5B. Moderate Crown water lot acquisition required.	Least Preferred Estimated to have the highest relative costs. Moderate Crown water lot acquisition required.	Least Preferred Estimated to have the highest relative costs. Greatest amount of Crown water lot acquisition required.
	Maintenance and operations costs	<ul style="list-style-type: none"> Relative maintenance and operation costs of the shoreline and erosion works 	Preferred No new infrastructure provided. Low maintenance cost relative to the other Alternatives for maintenance of existing structures.	Preferred Low maintenance requirements.	Least Preferred Expected to have highest maintenance cost due to exposed nature of the bridge and need to replace components (e.g., bridge railings, deck, etc.).	Least Preferred Expected to have highest maintenance cost due to exposed nature of the bridge and need to replace components (e.g., bridge railings, deck, etc.).	Intermediate Preferred Expected to have high-intermediate maintenance cost due to exposed nature of the bridge and need to replace components (e.g., bridge railings, deck, etc.). Shorter length of bridge than Alternatives 2A/2B. Low maintenance requirement for islands.	Intermediate Preferred Expected to have high-intermediate maintenance cost due to exposed nature of the bridge and need to replace components (e.g., bridge railings, deck, etc.). Shorter length of bridge than Alternatives 2A/2B. Low maintenance requirement for islands.	Preferred Low maintenance requirements.	Intermediate Preferred While beach and new headlands maintenance requirements are relatively low, bridge component requirements are high. Combined, high relative maintenance costs.	Preferred Low maintenance requirements.
Objective-Level Ranking			Most Preferred	Preferred	Intermediate Preferred	Least Preferred	Preferred	Intermediate Preferred	Preferred	Least Preferred	Intermediate Preferred

Notes: 1. Existing Conditions 2. Headland Beach 3. Short Span Bridge 4. Long Span Bridge 5. Short Span Island-Bridge 6. Long Span Island-Bridge 7. Causeway 8. Narrow Beach 9. Wide Beach

5.4.2.6 West Segment – Overall Evaluation Results

Table 5-8 provides a summary of the Objective rankings for the West Segment Alternatives. From this summary it is clear that Alternative 5B is Most Preferred, with four Most Preferred rankings and one Intermediate Preferred ranking. The advantages achieved by this Alternative are, on balance, outweighed by the additional costs or disadvantages. Key advantages of this Alternative leading to a rank of Most Preferred include:

- Provides greatest aquatic and terrestrial habitat enhancement opportunities, as there is the potential to increase shoreline morphology and shoreline substrate type diversity with the replacement of some of the coarse substrate material that has been removed historically, along with the potential for sand dune expansion with Alternative 5B;
- Provides good enhancement opportunities for land-water interface;
- Provides inclusive, continuous access along the shoreline;
- Reduces public safety risks; and,
- Provides additional Emergency Services access along waterfront.

Table 5-8: West Segment – Objective Level Evaluation Results Summary

Objective	Do Nothing ¹	Alternative 1 ²	Alternative 2A ³	Alternative 2B ⁴	Alternative 3A ⁵	Alternative 3B ⁶	Alternative 4 ⁷	Alternative 5A ⁸	Alternative 5B ⁹
Natural Environment	IP	P	IP	IP	IP	IP	LP	P	MP
Risk	LP	MP	MP	MP	MP	MP	MP	MP	MP
Experience	IP	P	IP	IP	IP	IP	IP	MP	MP
Co-ordination	LP	MP	MP	MP	MP	MP	MP	MP	MP
Cost	MP	P	IP	LP	P	IP	P	LP	IP
Overall	Least Preferred	Preferred	Intermediate Preferred	Intermediate Preferred	Preferred	Intermediate Preferred	Least Preferred	Preferred	Most Preferred

Notes: 1. Existing Conditions 4. Long Span Bridge 7. Causeway
 2. Headland Beach 5. Short Span Island-Bridge 8. Narrow Beach
 3. Short Span Bridge 6. Long Span Island-Bridge 9. Wide Beach

5.4.3 Evaluation Results – Central Segment

The following presents the results for the Alternatives comparative evaluation for the Central Segment. The evaluation is organized by Project Objective and presents the trade-offs that were made considering the Alternative assessment results as detailed in **Appendix F**. Two Alternatives plus the “Do Nothing” Alternative were assessed in the Central Segment as presented previously in **Section 5.3.2**.

5.4.3.1 Objective 1: Protect and Enhance Terrestrial and Aquatic Natural Features and Linkages

The Criteria and Indicators for this Objective measure the ability of each Alternative to protect existing natural features and enhance or create new habitat and linkages. For this Objective, the following Criteria were considered:

- Extent of Aquatic Habitat Enhanced or Diminished; and,
- Extent of Terrestrial Habitat Attributes Enhanced or Diminished.

Table 5-9 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 1. A more detailed evaluation table is provided in **Appendix F**.

Regarding the Criterion *Extent of Aquatic Habitat Enhanced or Diminished*, Alternative 1 (Headland Beach) was ranked Most Preferred and ahead of Alternative 2 (Revetment). Although Alternative 1 has the highest amount of infill and corresponding loss or modification of existing habitat, this Alternative provides the highest potential for habitat enhancement opportunities through an increase in shoreline substrate type diversity with the addition of cobble beaches, along with an increase in shoreline morphology associated with a more irregular shoreline. These improvements benefit fish communities, both resident and migratory.

Concerning the Criterion *Extent of Terrestrial Habitat Attributes Enhanced or Diminished*, Alternative 1 (Headland Beach) was ranked Most Preferred as it provides the greatest length of land-water interface, relative to the existing and proposed (Alternative 2) revetment features, and is not anticipated to have any permanent negative impacts on existing vegetation communities of concern.

Considering the above Criteria rankings, the preferred Central Segment Alternative for Objective 1 was Alternative 1 (Headland Beach) as it was ranked Most Preferred for both Criteria. Its key advantage is that it provides a greater benefit for the enhancement of aquatic and terrestrial habitat than Alternative 2 (Revetment).

5.4.3.2 Objective 2: Manage Public Safety and Property Risk

The Criteria and Indicators for this Objective measure the ability of each Alternative to manage public safety and property risk. For this Objective, the following Criterion was considered:

- Ability to Minimize Public Safety Risk and Property Loss as a Result of Slope Erosion/Failure.

Table 5-10 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 2. A more detailed evaluation table is provided in **Appendix F**.

Regarding the Criterion *Ability to Minimize Public Safety Risk and Property Loss as a Result of Slope Erosion/Failure*, both Alternatives 1 and 2 were ranked as Most Preferred as they effectively minimize risk to public safety by allowing for trail development outside of the risk line. The “Do Nothing” Alternative was ranked Least Preferred as there was no change to the existing risk.

Table 5-9: Central Segment, Objective 1 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1 ²	Alternative 2 ³
Protect and enhance terrestrial and aquatic natural features and linkages	Extent of aquatic habitat enhanced or diminished	<ul style="list-style-type: none"> Ability to increase shoreline morphology by increasing shoreline irregularity Ability to increase shoreline substrate type diversity Potential for aquatic habitat loss or modification 	<p>Least Preferred</p> <p>No fill, but no increase in morphology. No improvement in shoreline substrate type diversity.</p>	<p>Most Preferred</p> <p>High amount of fill (65,000 m²). Highest increase in morphology through a 15% increase in shoreline irregularity. Greatest improvement in shoreline substrate type diversity through a moderate increase in cobble substrate.</p>	<p>Intermediate Preferred</p> <p>High amount of fill (42,000 m²). Virtually no change to shoreline morphology and no change to shoreline substrate type diversity.</p>
	Extent of terrestrial habitat attributes enhanced or diminished	<ul style="list-style-type: none"> Potential to create appropriate land-water interface Impact to vegetation communities of concern 	<p>Intermediate Preferred</p> <p>No improvement to land-water interface. No impacts to vegetation communities of concern.</p>	<p>Most Preferred</p> <p>Greatest positive change to land-water interface through a 50% increase in shoreline length that provides a land-water interface that is always out of water. No anticipated impacts to vegetation communities of concern.</p>	<p>Intermediate Preferred</p> <p>No improvement to land-water interface. No anticipated impacts to vegetation communities of concern.</p>
Objective-Level Ranking			Least Preferred	Most Preferred	Intermediate Preferred

Notes: 1. Existing Conditions 2. Headland Beach 3. Revetment

Table 5-10: Central Segment, Objective 2 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1 ²	Alternative 2 ³
Manage public safety and property risk	Ability to minimize public safety risk and property loss as a result of slope erosion/failure	<ul style="list-style-type: none"> Ability to provide a trail lakeward of risk line along the shoreline and shoreward of the risk line along the top of the bluff 	<p>Least Preferred</p> <p>Along the west end of the Sylvan shoreline and along the Guild Park and Gardens shoreline, the access route is within the risk line.</p>	<p>Most Preferred</p> <p>Effectively minimizes risk to public safety (trail outside of risk line).</p>	<p>Most Preferred</p> <p>Effectively minimizes risk to public safety (trail outside of risk line).</p>
Objective-Level Ranking			Least Preferred	Most Preferred	Most Preferred

Notes: 1. Existing Conditions 2. Headland Beach 3. Revetment

Considering the above Criterion ranking, the Central Segment Preferred Alternative for Objective 2 was Alternative 1 (Headland Beach) and Alternative 2 (Revetment) as both were ranked Most Preferred for the Criterion.

5.4.3.3 Objective 3: Provide an Enjoyable Waterfront Experience

The Criteria and Indicators for this Objective measure the extent of each Alternative's ability to provide an enjoyable waterfront experience. For this Objective, the following Criterion was considered:

- Improve Public Access to the Waterfront.

Table 5-11 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 3. A more detailed evaluation table is provided in **Appendix F**.

For the Criterion *Improve Public Access to the Waterfront*, Alternative 1 (Headland Beach) was ranked Most Preferred as it provides continuous formal public access along entire length of shoreline at the shoreline; allows for a primary to high-capacity multi-use trail; and offers potential to address AODA grade requirements. It also provides formal direct access to the water over the greatest length.

5.4.3.4 Objective 4: Consistency and Co-ordination with Other Initiatives

The Criteria and Indicators for this Objective measure the extent to which the Alternatives are consistent and co-ordinated with other initiatives or plans in the Study Area. For this Objective, the following Criteria were considered:

- Ability to Integrate with City and Other Agency Plans and Initiatives; and,
- Potential Impact on Archaeological Resources, Built Heritage Resources, and Cultural Heritage Landscapes.

Table 5-12 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 4. A more detailed evaluation table is provided in **Appendix F**.

Considering the Criterion *Ability to Integrate with City and Other Agency Plans and Initiatives*, both Alternative 1 (Headland Beach) and Alternative 2 (Revetment) were ranked as Most Preferred as they provide additional contributions to the advancement of applicable fish community objectives through improvements in shoreline morphology and substrate diversity.

For the Criterion *Potential Impact on Archaeological Resources, Built Heritage Resources, and Cultural Heritage Landscapes*, both Alternatives were ranked as Preferred as the marine archaeological assessment identified three targets in proximity to the new proposed shoreline structures that could potentially be impacted; however, mitigation is possible.

Considering the preference rankings for the Criteria associated with Objective 4, both Alternative 1 (Headland Beach) and Alternative 2 (Revetment) were identified as Most Preferred.

Table 5-11: Central Segment, Objective 3 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1 ²	Alternative 2 ³
Provide an enjoyable waterfront experience	Improve public access to the waterfront	<ul style="list-style-type: none"> Potential to provide continuous formal public access along the shoreline Ability to accommodate a primary to high-capacity multi-use trail (width) Ability to meet AODA grade standard Ability to provide formal direct public access to the water 	<p>Least Preferred</p> <p>Does not provide for continuous public access or a primary to high-capacity multi-use trail along the shoreline, does not accommodate AODA grade access, and does not provide formal direct public access to the water.</p>	<p>Most Preferred</p> <p>Provides continuous formal public access along entire length of shoreline at the shoreline and allows for a primary to high-capacity multi-use trail. Offers potential to address AODA grade requirements. Also provides formal direct access to the water for the greatest length (approximately 1,700 m).</p>	<p>Preferred</p> <p>Provides continuous formal public access along entire length of shoreline and allows for a primary to high-capacity multi-use trail. Offers potential to address AODA grade requirements. Provides approximately 40% less shoreline for formal direct access to the water, relative to Alternative 1 (due to the revetment).</p>
Objective-Level Ranking			Least Preferred	Most Preferred	Preferred

Notes: 1. Existing Conditions 2. Headland Beach 3. Revetment

Table 5-12: Central Segment, Objective 4 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1 ²	Alternative 2 ³
Consistency and co-ordination with other initiatives	Ability to integrate with City and other agency plans and initiatives	<ul style="list-style-type: none"> Consistency with the goals of the Fish Community Objectives for Lake Ontario 	<p>Least Preferred</p> <p>Does not provide additional contributions to the advancement of any applicable fish community objectives.</p>	<p>Most Preferred</p> <p>Provides additional contributions to the advancement of applicable fish community objectives.</p>	<p>Most Preferred</p> <p>Provides additional contributions to the advancement of applicable fish community objectives.</p>
	Potential impact on archaeological resources, built heritage resources, and cultural heritage landscapes	<ul style="list-style-type: none"> Potential to impact known or potential archaeological resources 	<p>Most Preferred</p> <p>No impact to any known or potential archaeological resources.</p>	<p>Preferred</p> <p>The marine archaeological assessment identified three targets in proximity to the new proposed shoreline structures that could potentially be impacted; however, mitigation is possible.</p>	<p>Preferred</p> <p>The marine archaeological assessment identified three targets in proximity to the new proposed shoreline structures that could potentially be impacted, however, mitigation is possible.</p>
Objective-Level Ranking			Least Preferred	Most Preferred	Most Preferred

Notes: 1. Existing Conditions 2. Headland Beach 3. Revetment

5.4.3.5 Objective 5: Achieve Value for Cost

The Criteria and Indicators for this Objective consider the capital and long-term maintenance and operating costs of the Alternatives. For this Objective, the following Criteria were considered:

- Estimated Capital Cost; and,
- Maintenance and Operations Costs.

Table 5-13 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 5. A more detailed evaluation table is provided in **Appendix F**.

For the Criterion *Estimated Capital Cost*, the “Do Nothing” Alternative was ranked as Most Preferred as it does not involve any infrastructure works or Crown water lot acquisition.

For the *Maintenance and Operations Cost* Criterion, Alternative 2 (Revetment) was ranked as Most Preferred as it has the least maintenance requirements.

Considering the above ranking Criteria, the Alternative ranked Most Preferred for Objective 5 was the “Do Nothing” Alternative, as it has no infrastructure or Crown water lot costs.

Table 5-13: Central Segment, Objective 5 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1 ²	Alternative 2 ³
Achieve value for cost	Estimated capital cost	<ul style="list-style-type: none"> ▪ Estimated cost to construct (relative to each other) ▪ Potential amount of water lot and property acquisition required (relative to each other) 	<p>Most Preferred</p> <p>No construction or property acquisition costs.</p>	<p>Least Preferred</p> <p>Highest relative costs. Greater amount of Crown water lots required than Alternative 2.</p>	<p>Intermediate Preferred</p> <p>Lower cost than Alternative 1. Lesser amount of Crown water lots required than Alternative 1.</p>
	Maintenance and operations costs	<ul style="list-style-type: none"> ▪ Relative maintenance and operation costs of the shoreline and erosion works 	<p>Intermediate Preferred</p> <p>Ongoing maintenance of existing concrete rubble shore will be required (existing shoreline works at Guild Parks and Gardens in need of repair).</p>	<p>Preferred</p> <p>Low maintenance requirements.</p>	<p>Most Preferred</p> <p>Least maintenance requirements.</p>
Objective-Level Ranking			Most Preferred	Intermediate Preferred	Preferred

Notes: 1. Existing Conditions 2. Headland Beach 3. Revetment

5.4.3.6 Central Segment – Overall Evaluation Results

Table 5-14 provides a summary of the rankings by Objective for all Central Segment Alternatives. Alternative 1 (Headland Beach) was ranked Most Preferred for four of the five Objectives. The only Objective for which it was not ranked Most Preferred was for *Achieve Value for Cost*, therefore, this is its only disadvantage. It was determined by the Project Team that the additional advantages of Alternative 1 (Headland Beach) justify its additional costs or disadvantages. As such, Alternative 1 (Headland Beach) was ranked as the Preferred Alternative for the Central Segment.

Table 5-14: Central Segment – Objective Level Evaluation Results Summary

Objective	Do Nothing ¹	Alternative 1 ²	Alternative 2 ³
Natural Environment	LP	MP	IP
Risk	LP	MP	MP
Experience	LP	MP	P
Co-ordination	LP	MP	MP
Cost	MP	IP	P
Overall	Intermediate Preferred	Most Preferred	Preferred

Notes: 1. Existing Conditions 2. Headland Beach 3. Revetment

5.4.4 Evaluation Results – East Segment

The following presents the comparative evaluation results for the East Segment. The evaluation is organized by Project Objective and presents the trade-offs that were made considering the Alternative assessment results as detailed in **Appendix F**. Nine Alternatives plus the “Do Nothing” Alternative were assessed in the East Segment as described previously in **Section 5.3.3**.

5.4.4.1 Objective 1: Protect and Enhance Terrestrial and Aquatic Natural Features and Linkages

The Criteria and Indicators for this Objective measure the ability of each Alternative to protect existing natural features and enhance or create new habitat and linkages. For this Objective, the following Criteria were considered:

- Extent of Aquatic Habitat Enhanced or Diminished;
- Extent of Terrestrial Habitat Attributes Enhanced or Diminished; and,
- Potential for Impact on Terrestrial Species at Risk.

Table 5-15 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 1. A more detailed evaluation table is provided in **Appendix F**.

Regarding the Criterion *Extent of Aquatic Habitat Enhanced or Diminished*, the Most Preferred Alternative was Alternative 4B (Headland Beach to East Point Park) as, despite a fairly high amount of fill to be used, this Alternative increases the shoreline morphology through the greatest increase in

Table 5-15: East Segment, Objective 1 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1A ²	Alternative 1B ³	Alternative 2A ⁴	Alternative 2B ⁵	Alternative 3A ⁶	Alternative 3B ⁷	Alternative 4A ⁸	Alternative 4B ⁹	Alternative 5 ¹⁰
Protect and enhance terrestrial and aquatic natural features and linkages	Extent of aquatic habitat enhanced or diminished	<ul style="list-style-type: none"> Ability to increase shoreline morphology by increasing shoreline irregularity Ability to increase shoreline substrate type diversity Potential for aquatic habitat loss or modification 	Intermediate Preferred No fill, but no improvements to morphology or substrate type diversity.	Intermediate Preferred Medium amount of fill (48,000 m ²). Increase in morphology through a 20% increase in shoreline irregularity. Some improvement in shoreline substrate type diversity with moderate increases in cobble and boulder proportions, relative to the previously existing sand-dominated substrate.	Intermediate Preferred Highest amount of fill (94,000 m ²). Increase in morphology through a 20% increase in shoreline irregularity. Some improvement to shoreline substrate type diversity with moderate increases in cobble proportions. However, high increases in boulder proportions result in a high reduction in sand proportions.	Intermediate Preferred Low-medium amount of fill (26,000 m ²). Minor increase in morphology through a 10% increase in shoreline irregularity. Some improvement to shoreline substrate type diversity with moderate increases in cobble and boulder proportions, relative to the previously existing sand-dominated substrate.	Least Preferred High amount of fill (71,000 m ²). Minor increase in morphology through a 10% increase in shoreline irregularity. Some improvement to shoreline substrate type diversity through moderate increases in cobble proportions. However, high increases in boulder proportions result in a high reduction in sand proportions.	Intermediate Preferred Medium amount of fill (48,000 m ²). Increase in morphology through a 20% increase in shoreline irregularity. Some improvement in shoreline substrate type diversity with moderate increases in cobble and boulder proportions, relative to the previously existing sand-dominated substrate.	Intermediate Preferred Highest amount of fill (94,000 m ²). Increase in morphology through a 20% increase in shoreline irregularity. Some improvement in shoreline substrate type diversity through moderate increases in cobble and boulder proportions. However, high increases in boulder proportions result in a high reduction in sand proportions.	Preferred High amount of fill (59,000 m ²). Increase in morphology through a 20% increase in shoreline irregularity. Improvement in shoreline substrate type diversity with moderate increases in cobble and boulder proportions, relative to the previously existing sand-dominated substrate.	Most Preferred High amount of fill (86,000 m ²). Greatest increase in morphology through a 30% increase in shoreline irregularity. Greatest improvement in shoreline substrate type diversity through high increases in cobble proportions, and moderate increases in boulder proportions, relative to the existing sand-dominated substrate.	Intermediate Preferred No fill, but no improvements to morphology or substrate type diversity.
	Extent of terrestrial habitat attributes enhanced or diminished	<ul style="list-style-type: none"> Potential to create appropriate land-water interface Impact to vegetation communities of concern 	Intermediate Preferred No improvement to land-water interface (100% of the shoreline provides a land-water interface that is sometimes out of the water). No additional impacts to vegetation communities of concern beyond existing conditions (trampling through informal trail use).	Intermediate Preferred Overall gain to land-water interface through the addition of shoreline that is always out of the water (approximately half that provided by Alternative 4B). Land-water interface that is sometimes out of water is reduced by ~30%. Moderate impact to ~1,300 m ² of vegetation communities of concern. However, there is potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.	Least Preferred Overall loss to land-water interface through a reduction in shoreline length that provides a land-water interface that is sometimes out of water by ~80%. Addition of land-water interface that is always out of water is equivalent to 1A. High degree of impact to ~18,800 m ² of vegetation communities of concern. However, there is potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.	Intermediate Preferred Overall gain to land-water interface through the addition of shoreline that is always out of the water (approximately 30% of what is provided by Alternative 4B). Land-water interface that is sometimes out of water is reduced by ~20%. Moderate impact to ~1,300 m ² of vegetation communities of concern. However, there is potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.	Least Preferred Overall loss to land-water interface through a reduction in shoreline length that provides a land-water interface that is sometimes out of water by ~60%. Addition of land-water interface that is always out of water is equivalent to 2A. High degree of impact to ~18,800 m ² of vegetation communities of concern. However, there is potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.	Intermediate Preferred Overall gain to land-water interface through the addition of shoreline that is always out of the water (approximately 40% of what is provided by Alternative 4B). Land-water interface that is sometimes out of water is reduced by ~20%. Moderate impact to ~1,300 m ² of vegetation communities of concern. However, there is potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.	Least Preferred Overall loss to land-water interface through a reduction in shoreline length that provides a land-water interface that is sometimes out of water by ~60%. Addition of a land-water interface that is always out of water is equivalent to 3A. High degree of impact to ~18,800 m ² of vegetation communities of concern. However, there is potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.	Intermediate Preferred Overall gain to land-water interface through the addition of shoreline that is always out of the water (approximately half that provided by Alternative 4B). Land-water interface that is sometimes out of water is reduced by ~50%. High degree of impact to 11,100 m ² of vegetation communities of concern. However, there is also the potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.	Preferred Greatest gain to land-water interface with the addition of approximately 1,400 m of shoreline that provides a land-water interface that is always out of the water. Land-water interface that is sometimes out of water is reduced by ~50%. Moderate impacts to ~5,300 m ² of vegetation communities of concern. However, there is also the potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.	Least Preferred No improvement to land-water interface. Bridge construction would likely require vegetation clearing on both sides of Grey Abbey Ravine, and potentially down within the ravine, with additional changes to bluff vegetation community composition anticipated due to the shading effects of the bridge. Significant impacts to three bluff vegetation communities of concern (BLO1, BLS1-A and BLT1-B) are anticipated. Permanent loss of ~950 m ² of a mid-aged paper birch forest (FOD8-B) would be required for the trail on the west side of the ravine. However, there is the potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.

Table 5-15: East Segment, Objective 1 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1A ²	Alternative 1B ³	Alternative 2A ⁴	Alternative 2B ⁵	Alternative 3A ⁶	Alternative 3B ⁷	Alternative 4A ⁸	Alternative 4B ⁹	Alternative 5 ¹⁰
Potential for impact on terrestrial Species at Risk	Potential effects to habitat for Bank Swallow	<p>Most Preferred</p> <p><u>Between Grey Abbey Park and west of East Point Park:</u> No direct impacts to Bank Swallow habitat, as the nests are currently restricted to the upper portion (due to existing vegetation) that is expected to continue eroding into the future.</p> <p><u>Around East Point Park:</u> No direct impacts to Bank Swallow habitat.</p>	<p>Most Preferred</p> <p><u>Between Grey Abbey Park and west of East Point Park:</u> No direct impacts to Bank Swallow habitat, as the nests are currently restricted to the upper portion (due to existing vegetation) that is expected to continue eroding into the future.</p> <p><u>Around East Point Park:</u> No direct impacts to Bank Swallow habitat, as no shoreline works are proposed. Top-of-bluff connection limits human disturbance.</p>	<p>Least Preferred</p> <p><u>Between Grey Abbey Park and west of East Point Park:</u> No direct impacts to Bank Swallow habitat, as the nests are currently restricted to the upper portion (due to existing vegetation) that is expected to continue eroding into the future.</p> <p><u>Around East Point Park:</u> Potential reduction in lesser quality Bank Swallow habitat availability, as protection works will halt toe erosion and encourage increased vegetation along the primarily bare bluff face. Human disturbance due to low bluff height is also increased.</p>	<p>Most Preferred</p> <p><u>Between Grey Abbey Park and west of East Point Park:</u> No direct impacts to Bank Swallow habitat, as the nests are currently restricted to the upper portion (due to existing vegetation) that is expected to continue eroding into the future.</p> <p><u>Around East Point Park:</u> No direct impacts to Bank Swallow habitat, as no shoreline works are proposed. Top-of-bluff connection limits human disturbance.</p>	<p>Least Preferred</p> <p><u>Between Grey Abbey Park and west of East Point Park:</u> No direct impacts to Bank Swallow habitat, as the nests are currently restricted to the upper portion (due to existing vegetation) that is expected to continue eroding into the future.</p> <p><u>Around East Point Park:</u> Potential reduction in lesser quality Bank Swallow habitat availability, as protection works will halt toe erosion and encourage increased vegetation along the primarily bare bluff face. Human disturbance due to low bluff height is also increased.</p>	<p>Most Preferred</p> <p><u>Between Grey Abbey Park and west of East Point Park:</u> No direct impacts to Bank Swallow habitat, as the nests are currently restricted to the upper portion (due to existing vegetation) that is expected to continue eroding into the future.</p> <p><u>Around East Point Park:</u> No direct impacts to Bank Swallow habitat, as no shoreline works are proposed. Top-of-bluff connection limits human disturbance.</p>	<p>Least Preferred</p> <p><u>Between Grey Abbey Park and west of East Point Park:</u> No direct impacts to Bank Swallow habitat, as the nests are currently restricted to the upper portion (due to existing vegetation) that is expected to continue eroding into the future.</p> <p><u>Around East Point Park:</u> Potential reduction in lesser quality Bank Swallow habitat availability, as protection works will halt toe erosion and encourage increased vegetation along the primarily bare bluff face. Human disturbance due to low bluff height is also increased.</p>	<p>Most Preferred</p> <p><u>Between Grey Abbey Park and west of East Point Park:</u> No direct impacts to Bank Swallow habitat, as the nests are currently restricted to the upper portion (due to existing vegetation) that is expected to continue eroding into the future.</p> <p><u>Around East Point Park:</u> No direct impacts to Bank Swallow habitat, as no shoreline works are proposed. Top-of-bluff connection limits human disturbance.</p>	<p>Most Preferred</p> <p><u>Between Grey Abbey Park and west of East Point Park:</u> No direct impacts to Bank Swallow habitat, as the nests are currently restricted to the upper portion (due to existing vegetation) that is expected to continue eroding into the future.</p> <p><u>Around East Point Park:</u> No direct impacts to Bank Swallow habitat, as no shoreline works are proposed. Top-of-bluff connection limits human disturbance.</p>	<p>Most Preferred</p> <p><u>Between Grey Abbey Park and west of East Point Park:</u> No direct impacts to Bank Swallow habitat, as the nests are currently restricted to the upper portion (due to existing vegetation) that is expected to continue eroding into the future.</p> <p><u>Around East Point Park:</u> No direct impacts to Bank Swallow habitat, as no shoreline works are proposed. Top-of-bluff connection limits human disturbance.</p>	<p>Most Preferred</p> <p><u>Between Grey Abbey Park and west of East Point Park:</u> No direct impacts to Bank Swallow habitat, as the nests are currently restricted to the upper portion (due to existing vegetation) that is expected to continue eroding into the future.</p> <p><u>Around East Point Park:</u> No direct impacts to Bank Swallow habitat, as no shoreline works are proposed. Top-of-bluff connection limits human disturbance.</p>
			Objective-Level Ranking	Intermediate Preferred	Preferred	Least Preferred	Intermediate Preferred	Least Preferred	Intermediate Preferred	Least Preferred	Preferred	Most Preferred

Notes: 1. Existing Conditions
 2. Headland Beach with Top of Bluffs Connection
 3. Headland Beach with Base of Bluffs Connection
 4. Bridge & Headlands with Top of Bluffs Connection
 5. Bridge & Headlands with Base of Bluffs Connection
 6. Island-Bridge & Headlands with Top of Bluffs Connection
 7. Island-Bridge & Headlands with Base of Bluffs Connection
 8. Headland Beach with Revetment to East Point Park
 9. Headland Beach to East Point Park
 10. Top of Bluffs Connection Over Grey Abbey Ravine

shoreline irregularity relative to all other Alternatives. Shoreline substrate type diversity is also increased to the greatest extent, with a decrease in sand supplemented by high increases in cobble and moderate increases in armourstone (boulder). The added complexity associated with increased shoreline irregularity and substrate type diversity provides more habitat to be utilized by a greater number of fish species.

Concerning the Criterion *Extent of Terrestrial Habitat Attributes Enhanced or Diminished*, Alternative 4B (Headland Beach to East Point Park) was ranked as Preferred. Alternative 4B provides the most positive changes to land-water interface through the greatest increase in an interface that is always out of water, with minor impacts to beach vegetation communities of concern and moderate impacts to bluff vegetation communities of concern. Alternative 4B will reduce existing impacts on vegetation communities of concern associated with informal trail use and trampling by creating a formal trail network to and along the water's edge. All of the Alternatives that include the revetment features result in significant impacts to beach vegetation communities of concern, while Alternative 5 (Top of Bluffs Connection Over Grey Abbey Ravine) will result in significant impacts to bluff vegetation communities of concern, as well as a mid-aged paper birch forest community, through construction. The Alternatives with revetment features will also result in an overall reduction in the existing land-water interface. While the "Do Nothing" Alternative has no direct impact, it also provides no habitat enhancement opportunity and no opportunity to decommission informal trails currently degrading vegetation communities.

Finally, regarding the Criterion *Potential for Impact on Terrestrial Species at Risk*, the "Do Nothing" Alternative, along with Alternatives 1A (Headland Beach with Top of Bluffs Connection), 2A (Bridge & Headlands with Top of Bluffs Connection), 3A (Island-Bridge & Headlands with Top of Bluffs Connection), 4A (Headland Beach with Revetment to East Point Park), 4B (Headland Beach to East Point Park), and Alternative 5 (Top of Bluffs Connection Over Grey Abbey Ravine) were ranked as Most Preferred, as the existing Bank Swallow nests between Grey Abbey and East Point Park are currently restricted to the upper portion of bluff (due to existing vegetation) that is expected to continue eroding into the future. As the existing Bank Swallow nests located at East Point Park are also situated lower to the ground due to the lower height of the Bluffs, relative to the bluff heights west of East Point Park, a tableland trail through East Point is likely to reduce human disturbance to these nests (as compared to a formal shoreline trail around East Point Park).

Considering the above Criteria-level rankings, Alternative 4B (Headland Beach to East Point Park) was ranked Most Preferred in the East Segment for Objective 1 as it provides the most opportunities for aquatic and terrestrial habitat enhancement.

5.4.4.2 Objective 2: Manage Public Safety and Property Risk

The Criteria and Indicators for this Objective measure the ability of each Alternative to manage public safety and property risk. For this Objective, the following Criteria were considered:

- Ability to Minimize Public Safety Risk and Property Loss as a Result of Slope Erosion/Failure; and,
- Improve Emergency Services Access to the Waterfront.

Table 5-16 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 2. A more detailed evaluation table is provided in **Appendix F**.

Regarding the Criterion *Ability to Minimize Public Safety Risk and Property Loss as a Result of Slope Erosion/Failure*, five Alternatives were ranked Most Preferred including Alternatives 1B, 2B, 3B, 4A, and 4B as these Alternatives effectively minimize risk to public safety by providing a public trail outside of the risk line, with less potential for property loss. Risk of erosion to Greyabbey Trail is mitigated.

Regarding the Criterion *Improve Emergency Services Access to the Waterfront*, all Alternatives except the “Do Nothing” Alternative were all ranked as Most Preferred as these Alternatives all improve Emergency Services access along the waterfront either through trail improvements along the shore or along the tablelands.

Considering the above Criteria rankings, the Preferred Alternatives in the East Segment for Objective 2 were Alternatives 1B, 2B, 3B, 4A, and 4B, as these Alternatives effectively minimize risk to public safety by providing a trail outside of the risk line, will have limited loss of property (open space, public recreational amenities and water/servicing infrastructure), and provides Emergency Services access along entire length of the Segment.

5.4.4.3 Objective 3: Provide an Enjoyable Waterfront Experience

The Criteria and Indicators for this Objective measure the extent of each Alternative’s ability to provide an enjoyable waterfront experience. For this Objective, the following Criteria were considered:

- Improve Public Access to the Waterfront; and,
- Potential for Changes to the Use of the Waterfront for Recreation.

Table 5-17 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 3. A more detailed evaluation table is provided in **Appendix F**.

For the Criterion *Improve Public Access to the Waterfront*, Alternative 4B (Headland Beach to East Point Park) was ranked Most Preferred as it provides the best opportunity to improve public access along the shoreline including the development of a multi-use trail and provides opportunity to meet AODA grade requirements. Formal direct public access to the water is provided through the headland beach sections of shoreline for the greatest length, and informal access that is not restricted by private property or critical infrastructure is continued along the East Point Park sand shoreline.

With respect to *Potential for Changes to the Use of the Waterfront for Recreation*, the “Do Nothing” Alternative and Alternatives 1A, 2A, 3A, and 5 were ranked highest as Preferred. Regarding the “Do Nothing” Alternative and Alternative 5, these Alternatives would result in no change to the existing sandy shoreline, nor would formal access for the greatest number of users be provided. Alternatives 4A and 4B result in a moderate impact to the existing sandy shoreline, but less impact than the Alternatives that involve improvement to the full length of the bluff base. There has been considerable comment from the public about the value of the existing sand shorelines in the East

Table 5-16: East Segment, Objective 2 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1A ²	Alternative 1B ³	Alternative 2A ⁴	Alternative 2B ⁵	Alternative 3A ⁶	Alternative 3B ⁷	Alternative 4A ⁸	Alternative 4B ⁹	Alternative 5 ¹⁰
Manage public safety and property risk	Ability to minimize public safety risk and property loss as a result of slope erosion/failure	<ul style="list-style-type: none"> Ability to provide a trail lakeward of risk line along the shoreline and shoreward of the risk line along the top of the bluff Ability to address the potential loss of public property and infrastructure as a result of slope erosion/failure (slope crest migration) 	Least Preferred Cannot effectively minimize public safety risk or property loss. Greyabbey Trail (e.g., road and associated infrastructure) would be at risk from erosion within the planning timeframe of the Project (approximately 60 years).	Preferred Effectively minimizes risk to public safety (trail outside of risk line) but will have greater degree of property loss though the loss will occur over the long-term. Risk of erosion to Greyabbey Trail is mitigated.	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line) and will have limited loss of property. Risk of erosion to Greyabbey Trail is mitigated.	Preferred Effectively minimizes risk to public safety (trail outside of risk line) but will have greater degree of property loss though the loss will occur over the long-term. Risk of erosion to Greyabbey Trail is mitigated.	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line) and will have limited loss of property. Risk of erosion to Greyabbey Trail is mitigated.	Preferred Effectively minimizes risk to public safety (trail outside of risk line) but will have greater degree of property loss though the loss will occur over the long-term. Risk of erosion to Greyabbey Trail is mitigated.	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line) and will have limited loss of property. Risk of erosion to Greyabbey Trail is mitigated.	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line) and will have limited loss of property. Risk of erosion to Greyabbey Trail is mitigated.	Most Preferred Effectively minimizes risk to public safety (trail outside of risk line) and will have limited loss of property. Risk of erosion to Greyabbey Trail is mitigated.	Intermediate Preferred Effectively minimizes risk to public safety (trail outside of risk line) but will have the greatest degree of property loss though the loss will occur over the long-term. Greyabbey Trail (e.g., road and associated infrastructure) would be at risk from erosion within the planning timeframe of the Project (approximately 60 years).
	Improve Emergency Services access to the waterfront	<ul style="list-style-type: none"> Ability to provide additional Emergency Services access along the waterfront 	Least Preferred Allows for only limited access for some vehicles.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.	Most Preferred Provides access along entire length of Segment.
Objective-Level Ranking			Least Preferred	Preferred	Most Preferred	Preferred	Most Preferred	Preferred	Most Preferred	Most Preferred	Most Preferred	Intermediate Preferred

Notes: 1. Existing Conditions
 2. Headland Beach with Top of Bluffs Connection
 3. Headland Beach with Base of Bluffs Connection
 4. Bridge & Headlands with Top of Bluffs Connection
 5. Bridge & Headlands with Base of Bluffs Connection
 6. Island-Bridge & Headlands with Top of Bluffs Connection
 7. Island-Bridge & Headlands with Base of Bluffs Connection
 8. Headland Beach with Revetment to East Point Park
 9. Headland Beach to East Point Park
 10. Top of Bluffs Connection Over Grey Abbey Ravine

Table 5-17: East Segment, Objective 3 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1A ²	Alternative 1B ³	Alternative 2A ⁴	Alternative 2B ⁵	Alternative 3A ⁶	Alternative 3B ⁷	Alternative 4A ⁸	Alternative 4B ⁹	Alternative 5 ¹⁰
Provide an enjoyable waterfront experience	Improve public access to the waterfront	<ul style="list-style-type: none"> Potential to provide continuous formal public access along the shoreline Ability to accommodate a primary to high-capacity multi-use trail (width) Ability to meet AODA grade standard Ability to provide formal direct public access to the water 	Least Preferred Provides the least amount of continuous formal public access along the water's edge and accommodates the shortest portion of a primary to high-capacity multi-use trail. Also cannot accommodate AODA grade access and provides limited access to the water's edge (~50% of the existing shoreline is constrained by private property and critical infrastructure).	Intermediate Preferred Provides public access; however, requires a staircase (cyclists to dismount), thus AODA grade access provided east and west of staircase. Provides formal direct access to the shoreline (approximately half that provided by 4B); ~25% of the remaining shoreline remains inaccessible due to private property and critical infrastructure.	Preferred Provides continuous access along the shoreline, accommodates the primary to high-capacity multi-use trail width, and meets AODA grade requirements. Provides formal direct access to the water's edge (equivalent length to 1A); however, informal access is reduced by 80%, due to revetment, but previously inaccessible areas are now accessible.	Intermediate Preferred Provides public access; however, requires a staircase (cyclists to dismount), thus AODA grade access provided east and west of staircase. Provides formal direct access to the shoreline (approximately 30% of the length provided by 4B); ~35% of the remaining shoreline remains inaccessible due to private property and critical infrastructure.	Preferred Provides continuous access along the shoreline, accommodates the primary to high-capacity multi-use trail width, and meets AODA grade requirements. Provides formal direct access to the shoreline (equivalent length to 2A); however, informal access is reduced by 60% due to revetment and ~30% of the remaining shoreline remains inaccessible due to private property and critical infrastructure.	Intermediate Preferred Provides public access; however, requires a staircase (cyclists to dismount), thus AODA grade access provided east and west of staircase. Provides formal direct access to the shoreline (approximately 40% of the length provided by 4B); ~35% of the remaining shoreline remains inaccessible due to private property and critical infrastructure.	Preferred Provides continuous access along the shoreline, accommodates the primary to high-capacity multi-use trail width, and meets AODA grade requirements. Provides formal direct access to the shoreline (equivalent length to 3A); informal access is reduced by 60% due to revetment and ~30% of the remaining shoreline remains inaccessible due to private property and critical infrastructure.	Preferred Provides continuous access along the shoreline, accommodates the primary to high-capacity multi-use trail width, and meets AODA grade requirements. Provides formal direct access to the shoreline (approximately half that provided by 4B); however, informal access is reduced by 50% due to revetment, but previously inaccessible areas are now accessible.	Most Preferred Provides continuous access along the shoreline, accommodates the primary to high-capacity multi-use trail width, and meets AODA grade requirements. Provides longest length of formal direct access to the shoreline (approximately 1,400 m); previously inaccessible areas are now accessible.	Preferred Provides continuous access along the shoreline, accommodates the primary to high-capacity multi-use trail width, and meets AODA grade requirements. Provides limited access to the shoreline (no change to existing conditions).
	Potential for changes to the use of the waterfront for recreation	<ul style="list-style-type: none"> Potential for change in character of sandy shorelines 	Preferred No change to existing sandy shoreline, of which 50% is currently inaccessible and 15% has been previously modified. No enhanced beach area.	Preferred Approximate 25% reduction in existing sandy shoreline length, of which 100% is inaccessible and 40% has been previously modified. Provides approximately half the cobble beach enhancement of Alternative 4B.	Least Preferred Approximate 70% reduction in existing sandy shoreline length, of which 60% is inaccessible and 20% was previously modified. Provides approximately half the cobble beach enhancement of Alternative 4B.	Preferred Approximate 20% reduction in existing sandy shoreline length, of which 100% was inaccessible and 0% was previously modified. Provides approximately 30% of the cobble beach enhancement of Alternative 4B.	Least Preferred Approximate 70% reduction in existing sandy shoreline length, of which 80% is inaccessible and 0% was previously modified. Provides approximately 30% of the cobble beach enhancement of Alternative 4B.	Preferred Approximate 20% reduction in existing sandy shoreline length, of which 100% is inaccessible and 0% was previously modified. Provides approximately 40% of the cobble beach enhancement of Alternative 4B.	Least Preferred Approximate 70% reduction in existing sandy shoreline length, of which 80% is inaccessible and 0% was previously modified. Provides approximately 40% of the cobble beach enhancement of Alternative 4B.	Intermediate Preferred Approximate 40% reduction in existing sandy shoreline length, of which 90% is inaccessible and 25% was previously modified. Provides approximately half the cobble beach enhancement of Alternative 4B.	Intermediate Preferred Approximate 45% reduction in existing sandy shoreline length, of which 90% is inaccessible and 25% was previously modified. Provides the greatest enhancement to cobble beach (approximately 1400 m).	Preferred No change to existing sandy shoreline, of which 50% is currently inaccessible and 15% has been previously modified. No enhanced beach area.
Objective-Level Ranking			Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Preferred	Preferred

Notes: 1. Existing Conditions
 2. Headland Beach with Top of Bluffs Connection
 3. Headland Beach with Base of Bluffs Connection
 4. Bridge & Headlands with Top of Bluffs Connection
 5. Bridge & Headlands with Base of Bluffs Connection
 6. Island-Bridge & Headlands with Top of Bluffs Connection
 7. Island-Bridge & Headlands with Base of Bluffs Connection
 8. Headland Beach with Revetment to East Point Park
 9. Headland Beach to East Point Park
 10. Top of Bluffs Connection Over Grey Abbey Ravine

Segment. Many have reflected on the character of the sandy shoreline and the opportunity it provides for shoreline walks removed from the city. While the “Do Nothing” Alternative results in no physical changes to the sandy shoreline, it also results in limited formal, safe access to that sandy shoreline. Furthermore, 540 m of shoreline would remain in private ownership and not publically accessible. Private landowners have commented that they would like to reduce the incidences of trespass as people cross their properties to access the shore. It is noted that as the population increases more people will be drawn to the area for recreational purposes and the experience this shoreline provides today will change as use of the area increases. It is expected that the increased use will further degrade the current experience. The “Do Nothing” Alternative also does not provide long-term protection to Greyabbey Trail (e.g., road and associated infrastructure).

Considering the above two Criteria-level rankings, the Preferred East Segment Alternatives for Objective 3 were Alternatives 4B (Headland Beach to East Point Park) and 5 (Top of Bluffs Connection Over Grey Abbey Ravine). Key advantages of Alternative 4B are that it provides the opportunity to improve public access along the shoreline including a primary to high-capacity multi-use trail and has less impact to the existing sandy shoreline (does not impact East Point Park) as much as some of the other Alternatives.

5.4.4.4 Objective 4: Consistency and Co-ordination with Other Initiatives

The Criteria and Indicators for this Objective measure the extent to which each Alternative is consistent and co-ordinated with other initiatives or plans in the Study Area. The evaluation of this Objective is based on the following three Criteria:

- Ability to Integrate with City and other Agency Plans and Initiatives;
- Compatibility with Existing Land Use; and,
- Potential Impact on Archaeological Resources, Built Heritage Resources, and Cultural Heritage Landscapes.

Table 5-18 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 4. A more detailed evaluation table is provided in **Appendix F**.

Considering the Criterion *Ability to Integrate with City and Other Agency Plans and Initiatives*, all of the Alternatives, except the “Do Nothing” Alternative and Alternative 5 (Top of Bluffs Connection Over Grey Abbey Ravine), were ranked as Most Preferred as they provide the best opportunity for integration with identified plans and initiatives including:

- The trail would be rerouted away from the proposed Metrolinx Lakeshore East rail corridor expansion; and,
- The provision of additional contributions to the advancement of applicable fish community objectives.

Table 5-18: East Segment, Objective 4 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1A ²	Alternative 1B ³	Alternative 2A ⁴	Alternative 2B ⁵	Alternative 3A ⁶	Alternative 3B ⁷	Alternative 4A ⁸	Alternative 4B ⁹	Alternative 5 ¹⁰
Consistency and co-ordination with other initiatives	Ability to integrate with City and other agency plans and initiatives	<ul style="list-style-type: none"> Ability to integrate with new and proposed plans or initiatives Consistency with the goals of the Fish Community Objectives for Lake Ontario 	Least Preferred Planned expansion of the Metrolinx Lakeshore East rail corridor to accommodate the Regional Express Rail project could impact a section of the trail and could require its rerouting. This Alternative does not provide additional contributions to the advancement of applicable fish community objectives.	Most Preferred This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx Lakeshore East rail corridor. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	Most Preferred This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx Lakeshore East rail corridor. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	Most Preferred This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx Lakeshore East rail corridor. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	Most Preferred This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx Lakeshore East rail corridor. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	Most Preferred This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx Lakeshore East rail corridor. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	Most Preferred This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx Lakeshore East rail corridor. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	Most Preferred This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx Lakeshore East rail corridor. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	Most Preferred This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx Lakeshore East rail corridor. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	Intermediate Preferred This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx Lakeshore East rail corridor. This Alternative does not provide additional contributions to the advancement of applicable fish community objectives.
	Compatibility with existing land uses	<ul style="list-style-type: none"> Compatibility with existing land use (industrial) Compatibility with existing land use (residential) 	Least Preferred Existing trail closest to industrial and residential properties.	Preferred Section of new trail alignment runs directly in the back of industrial properties but trail relocated to open space. Limited private property acquisition.	Most Preferred The trail runs along the water's edge for its full length and is furthest away from residential and industrial properties. Limited private property acquisition.	Preferred Section of new trail alignment runs directly in the back of industrial properties but trail relocated to open space. Limited private property acquisition.	Most Preferred The trail runs along the water's edge for its full length and is furthest away from residential and industrial properties. Limited private property acquisition.	Preferred Section of new trail alignment runs directly in the back of industrial properties but trail relocated to open space. Limited private property acquisition.	Most Preferred The trail runs along the water's edge for its full length and is furthest away from residential and industrial properties. Limited private property acquisition.	Most Preferred The trail runs along the water's edge for its full length and is furthest away from residential and industrial properties. Limited private property acquisition.	Most Preferred The trail runs along the water's edge for its full length and is furthest away from residential and industrial properties. Limited private property acquisition.	Intermediate Preferred Existing trail closest to industrial and residential properties. Limited private property acquisition.
	Potential impact on archaeological resources, built heritage resources, and cultural heritage landscapes	<ul style="list-style-type: none"> Potential to impact known or potential archaeological resources 	Most Preferred No impact to any known or potential archaeological resources.	Most Preferred No impact to any known archaeological resources; however, there is potential to find resources on the tablelands.	Preferred This Alternative is not anticipated to impact any known or potential land-based archaeological resources as identified in a Stage 1 archaeological assessment. The marine archaeological assessment identified one archaeological artifact in proximity to the proposed shoreline protection structures. Mitigation is possible.	Most Preferred No impact to any known archaeological resources; however, there is potential to find resources on the tablelands.	Preferred This Alternative is not anticipated to impact any known or potential land-based archaeological resources as identified in a Stage 1 archaeological assessment. The marine archaeological assessment identified one archaeological artifact in proximity to the proposed shoreline protection structures. Mitigation is possible.	Most Preferred No impact to any known archaeological resources; however, there is potential to find resources on the tablelands.	Preferred This Alternative is not anticipated to impact any known or potential land-based archaeological resources as identified in a Stage 1 archaeological assessment. The marine archaeological assessment identified one archaeological artifact in proximity to the proposed shoreline protection structures. Mitigation is possible.	Most Preferred No impact to any known archaeological resources; however, there is potential to find resources on the tablelands.	Most Preferred No impact to any known archaeological resources; however, there is potential to find resources on the tablelands.	Most Preferred No impact to any known archaeological resources; however, there is potential to find resources on the tablelands.
Objective-Level Ranking			Least Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Most Preferred	Most Preferred	Intermediate Preferred

Notes: 1. Existing Conditions
 2. Headland Beach with Top of Bluffs Connection
 3. Headland Beach with Base of Bluffs Connection
 4. Bridge & Headlands with Top of Bluffs Connection
 5. Bridge & Headlands with Base of Bluffs Connection
 6. Island-Bridge & Headlands with Top of Bluffs Connection
 7. Island-Bridge & Headlands with Base of Bluffs Connection
 8. Headland Beach with Revetment to East Point Park
 9. Headland Beach to East Point Park
 10. Top of Bluffs Connection Over Grey Abbey Ravine

Regarding the Criterion *Compatibility with Existing Land Uses*, Alternatives 1B, 2B, 3B, 4A and 4B were ranked Most Preferred as the trail runs along the water's edge for its full length and is furthest away from residential and industrial properties.

For the Criterion *Potential Impact on Archaeological Resources, Built Heritage Resources, and Cultural Heritage Landscapes*, the "Do Nothing" Alternative and Alternatives 1A, 2A, 3A, 4A, 4B, and 5 were ranked Most Preferred as these Alternatives are not anticipated to impact any known or potential archaeological resources (land or marine).

Considering the rankings for the Criteria associated with Objective 4, Alternatives 4A (Headland Beach with Revetment to East Point Park) and 4B (Headland Beach to East Point Park) were ranked Most Preferred for all Criteria.

5.4.4.5 Objective 5: Achieve Value for Cost

The Criteria and Indicators for this Objective consider the capital and long-term maintenance and operating costs of the Alternatives and considered the following two Criteria:

- Estimated Capital Cost; and,
- Maintenance and Operations Costs.

Table 5-19 provides a Criteria-level summary of the Alternatives comparative evaluation for Objective 5. A more detailed evaluation table is provided in **Appendix F**.

For both the cost Criteria, the "Do Nothing" Alternative was ranked as Most Preferred as this Alternative does not involve any infrastructure works. Alternatives 1A, 1B, 4A, 4B, and 5 were the next least expensive and were ranked as Preferred.

Table 5-19: East Segment, Objective 5 Criteria Level Evaluation Summary

Objective	Criteria	Indicators	Do Nothing ¹	Alternative 1A ²	Alternative 1B ³	Alternative 2A ⁴	Alternative 2B ⁵	Alternative 3A ⁶	Alternative 3B ⁷	Alternative 4A ⁸	Alternative 4B ⁹	Alternative 5 ¹⁰
Achieve value for cost	Estimated capital cost	<ul style="list-style-type: none"> Estimated cost to construct (relative to each other) Potential amount of water lot and property acquisition required (relative to each other) 	Most Preferred No new infrastructure. Least cost. Lowest amount of private and Crown water lot acquisition.	Intermediate Preferred Higher cost relative to Alternatives 2A, 2B, 4B and 5, but lower than Alternatives 1B, 3A, 3B, 4A and 4B. Potential for higher cost due to geotechnical requirements of the staircase. Moderate amount of Crown water lot and private property acquisition.	Intermediate Preferred Higher cost relative to Alternatives 1A, 2A, 2B, 4B and 5, but lower than Alternatives 3A, 3B and 4A. Moderate amount of Crown water lot and private property acquisition.	Intermediate Preferred Higher cost than Alternative 5 but lower than Alternatives 1A, 1B, 2B, 3A, 3B, and 4A. Potential for higher cost due to geotechnical requirements of the staircase. Moderate amount of Crown water lot and private property acquisition.	Intermediate Preferred Higher cost relative to Alternatives 2A, 4B and 5, but lower than Alternatives 1A, 1B, 3A, 3B, and 4A. Moderate amount of Crown water lot and private property acquisition.	Intermediate Preferred Highest cost relative to other Alternatives. Potential for higher cost due to geotechnical requirements of the staircase. Moderate amount of Crown water lot and private property acquisition.	Intermediate Preferred Higher cost relative to Alternatives 1A, 1B, 2A, 2B, 4B, and 5 but lower than Alternative 3A. Moderate amount of Crown water lot and private property acquisition.	Intermediate Preferred Higher cost relative to Alternatives 1A, 1B, 2A, 2B, 4B and 5 but lower than Alternative 3A. Moderate amount of Crown water lot and private property acquisition.	Intermediate Preferred Higher cost than Alternative 5 but lower than Alternatives 1A, 1B, 2B, 3A, 3B, and 4A. Moderate amount of Crown water lot and private property acquisition.	Preferred Low relative cost as no shoreline works. Grey Abbey Ravine bridge construction is most significant cost. Low amount of Crown water lot and private property acquisition.
	Maintenance and operations costs	<ul style="list-style-type: none"> Relative maintenance and operation costs of the shoreline and erosion works 	Most Preferred Maintenance of existing works required, but most are private. Erosion works will be required in the future below Grey Abbey Park.	Preferred Low maintenance requirements.	Preferred Low maintenance requirements.	Intermediate Preferred Expected to have highest maintenance cost due to exposed nature of the bridge and need to replace components (e.g., bridge railings, deck, etc.). Low maintenance requirements for shore protection works.	Least Preferred Expected to have highest maintenance cost due to exposed nature of the bridge and need to replace components (e.g., bridge railings, deck, etc.). Low maintenance requirements for shore protection works.	Least Preferred Expected to have highest maintenance cost due to exposed nature of the bridge and need to replace components (e.g., bridge railings, deck, etc.). Low maintenance requirements for shore protection works.	Least Preferred Expected to have highest maintenance cost due to exposed nature of the bridge and need to replace components (e.g., bridge railings, deck, etc.). Low maintenance requirements for shore protection works.	Least Preferred Expected to have highest maintenance cost due to exposed nature of the bridge and need to replace components (e.g., bridge railings, deck, etc.). Low maintenance requirements for shore protection works.	Preferred Low maintenance requirements.	Preferred Low maintenance requirements.
Objective-Level Ranking			Most Preferred	Preferred	Preferred	Intermediate Preferred	Least Preferred	Least Preferred	Least Preferred	Preferred	Preferred	Preferred

Notes: 1. Existing Conditions
 2. Headland Beach with Top of Bluffs Connection
 3. Headland Beach with Base of Bluffs Connection
 4. Bridge & Headlands with Top of Bluffs Connection
 5. Bridge & Headlands with Base of Bluffs Connection
 6. Island-Bridge & Headlands with Top of Bluffs Connection
 7. Island-Bridge & Headlands with Base of Bluffs Connection
 8. Headland Beach with Revetment to East Point Park
 9. Headland Beach to East Point Park
 10. Top of Bluffs Connection Over Grey Abbey Ravine

5.4.4.6 East Segment – Overall Evaluation Results

Table 5-20 below provides a summary of the rankings by Objective for the East Segment Alternatives. The overall Preferred Alternative for the East Segment is Alternative 4B (Headland Beach to East Point Park) with a ranking of Most Preferred for three Objectives (Natural Environment, Risk and Co-ordination) and a ranking of Preferred for two Objectives (Experience and Cost).

Table 5-20: East Segment – Objective Level Evaluation Results Summary

Objective	Do Nothing ¹	Alternative 1A ²	Alternative 1B ³	Alternative 2A ⁴	Alternative 2B ⁵	Alternative 3A ⁶	Alternative 3B ⁷	Alternative 4A ⁸	Alternative 4B ⁹	Alternative 5 ¹⁰
Natural Environment	IP	P	LP	IP	LP	IP	LP	P	MP	IP
Risk	LP	P	MP	P	MP	P	MP	MP	MP	IP
Experience	IP	IP	IP	IP	IP	IP	IP	IP	P	P
Co-ordination	LP	P	P	P	P	P	P	MP	MP	IP
Cost	MP	P	P	IP	LP	LP	LP	P	P	P
Overall	Intermediate Preferred	Preferred	Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Intermediate Preferred	Preferred	Most Preferred	Intermediate Preferred

Notes: 1. Existing Conditions
 2. Headland Beach with Top of Bluffs Connection
 3. Headland Beach with Base of Bluffs Connection
 4. Bridge & Headlands with Top of Bluffs Connection
 5. Bridge & Headlands with Base of Bluffs Connection
 6. Island-Bridge & Headlands with Top of Bluffs Connection
 7. Island-Bridge & Headlands with Base of Bluffs Connection
 8. Headland Beach with Revetment to East Point Park
 9. Headland Beach to East Point Park
 10. Top of Bluffs Connection Over Grey Abbey Ravine

Key advantages of Alternative 4B include the following:

- Provides enhancements to terrestrial and aquatic habitat;
- Addresses risk to public safety by allowing development of a trail away from the risk line;
- Improves access for Emergency Services vehicles;
- Provides access to the shoreline to a large user group and increases public access along the water for approximately an additional 1,900 m of shoreline, through the acquisition of approximately 420 m of private property;
- Retains the existing sand shoreline through East Point Park;
- Is consistent/can be integrated with existing plans, including Metrolinx, and accommodates local land use including industrial facilities and the F.J. Horgan WTP.

As such, Alternative 4B (Headland Beach to East Point Park) was ranked as the Preferred Alternative for the East Segment.

5.5 Sensitivity Analysis of Alternate Plan for the Central and East Segments Submitted by the Friends of the Bluffs

In November 2016, the SWP Project Team received an Alternate Plan from a member of the public representing the *Friends of the Bluffs* for the Central and East Segments of the SWP. Given the public interest in this plan, TRCA undertook a sensitivity analysis which evaluated the Alternate Plan using

the Objectives, Criteria and Indicators used to select the Preferred Alternative. The results of the sensitivity analysis are detailed in **Appendix G**.

Based on the evaluation of the Alternate Plan, the following disadvantages were found for each Project Objective when compared to the Preferred Alternative:

Natural Environment Objective

- ▶ The Alternate Plan does not provide for the decommissioning of informal trails currently damaging vegetation communities on the tablelands and bluff slopes within East Point Park. In fact, the Alternate Plan has the potential to make this situation worse as it does not provide access to the shore between the Guild Park and Gardens and Beechgrove Drive, for a distance of ~2.9 km. Managed formal public access to the shoreline helps to prevent informal trails which are contributing to the loss of native vegetation, habitat fragmentation, displacement of fauna, soil compaction and resultant erosion, altered hydrology, and the spread of invasive species.
- ▶ The Alternate Plan does not provide comparable opportunities to improve aquatic habitat along the shoreline through the creation of a more diverse shoreline below Grey Abbey Park and east to East Point Park.

Risk Objective

- ▶ Recreational users along the existing sandy shoreline at East Point Park will be within the risk line for slope failure and, as such, use of this area will be at their assumed risk.
- ▶ Greyabbey Trail (the road and associated infrastructure) at the western end of Grey Abbey Park will be at risk from erosion within 60 years (**Figure 5-26**).
- ▶ Emergency Services access to the shoreline between the Guild Park and Gardens and Beechgrove Drive will not be improved.

Experience Objective

- ▶ The Alternate Plan will not address the displacement or disruption of the existing on-road and off-road sections of the Waterfront Trail between Greyabbey Trail and Beechgrove Drive. The Metrolinx Lakeshore East rail corridor expansion will constrain the existing on-road Waterfront Trail at the base of Manse Road, with train frequency increasing to every seven minutes (**Figure 5-26**). This will render the at-grade crossing of the trail unsafe or difficult to manage for those who cannot move quickly. This expansion may also potentially make the resulting off-road Waterfront Trail connection west of Copperfield Road and south of the rail corridor very narrow and unsafe.
- ▶ The new beach proposed at the base of the Guild Park and Gardens will be attractive to users but there will be limited opportunities to access the area as trail improvements to the Guild construction access route are impossible without significant impacts to vegetation communities of concern and private properties. The creation of a beach without appropriate access will likely result in users parking on residential streets and seeking informal or trespass access down the slope of the Bluffs potentially causing greater environmental damage to sensitive bluff vegetation communities.

- ▶ Achieving Blue Flag Beach status requires that a number of criteria be met including the provision of washrooms and parking which cannot be achieved at the base of the Guild Park and Gardens, given the access issues.
- ▶ The creation of a long headland to achieve sand accumulation in the Central Segment will preclude the accumulation of sand at Bluffer's Park Beach, so the Preferred Alternative for the West Segment (Wide Beach) cannot be achieved. There is the potential to fill the beach in the Alternate Plan through purchased material, such that sand will reach Bluffer's Park; however, this is a very expensive option.

Co-ordination Objective

- ▶ The Alternate Plan has the potential to create significant problems for adjacent residential properties either with respect to loss of the public infrastructure due to erosion, parking problems associated with access, and increased use of the Waterfront Trail within residential areas.
- ▶ The Alternate Plan does not consider the projected population increase in the City of Toronto (24.9% increase over the next 30 years) or the resultant pressure of increased use on greenspace.

Value for Cost Objective

- ▶ The cost of the Alternate Plan is 15% less than the cost of the Preferred Alternative; however, the lower cost does not offset the other disadvantages listed above.

Therefore, it was determined that the Alternate Plan does not meet the Project Objectives.

Figure 5-26: Constraints in the East Segment

