

## 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” that were developed attempted to address the identified existing problems (i.e., risk from erosion, limited waterfront access, low habitat integrity) and create new opportunities or benefits (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. All applicable components of the environment were considered as per the *Ontario EA Act*. 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 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, cyclist conflict on Brimley Road;

- 1,770 m<sup>1</sup> of shoreline access constrained by private ownership and critical infrastructure;
- No access to and along the waterfront for people of limited abilities east of Bluffer's beach; and,
- No formal access to the shoreline east of Doris McCarthy Trail.
- Opportunities to formalize access points, create continuous waterfront access in public ownership, provide access for all user's, 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; and,
  - Informal access along sandy shorelines at risk from landslides and other hazards.
  - 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; and,
  - Ongoing impacts to terrestrial communities of concern due to trampling and fragmentation as a result of informal access.
  - 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 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

<sup>1</sup> **Note:** all shoreline measurements are based on the curved nature of the shoreline, unless otherwise specified.

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.

## **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. All 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 clean fill guidelines. In addition, existing shoreline protection works were inspected to determine which required repair, retrofit, or maintenance.

## **THIRD: Identify Access Improvements along the Waterfront**

Access improvements along the waterfront were considered through trail routing. As noted both the City's 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 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, separated, a slope of not greater than 5%, and a maximum turning radius of 20 m. These design requirements provide for access by emergency 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. 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:

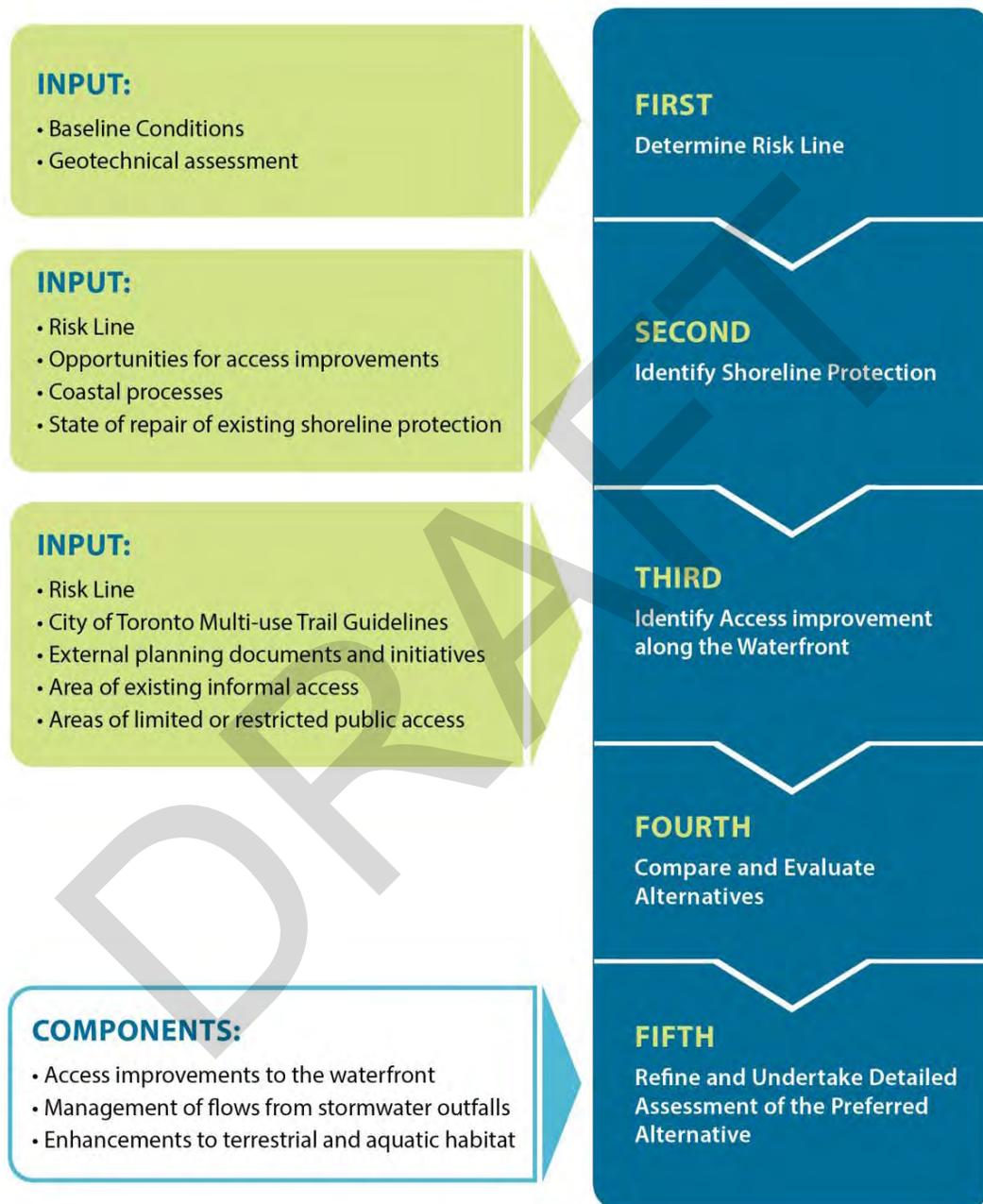
- Opportunities to improve access to the waterfront, for both vehicle (emergency services and maintenance only) and pedestrian / cycling access;
- Opportunities to manage stormwater outfalls prior to discharge to Lake Ontario;
- Opportunities to enhance and manage terrestrial habitat; and,
- Construction 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 benefits and effects 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.

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



### 5.3.1.1 West Segment Alternatives

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 in front of Cudia Park.

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 m<sup>2</sup>.

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

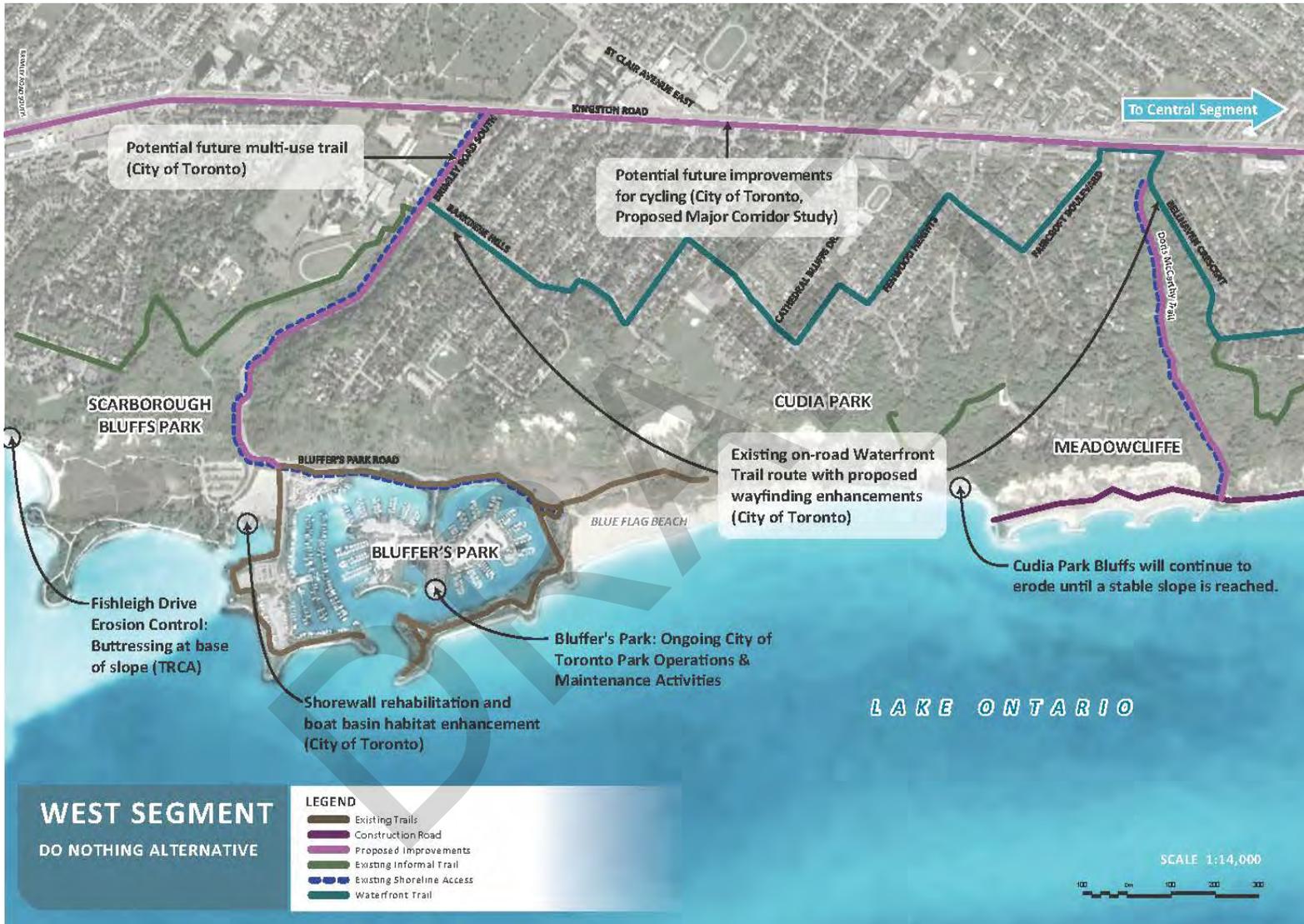
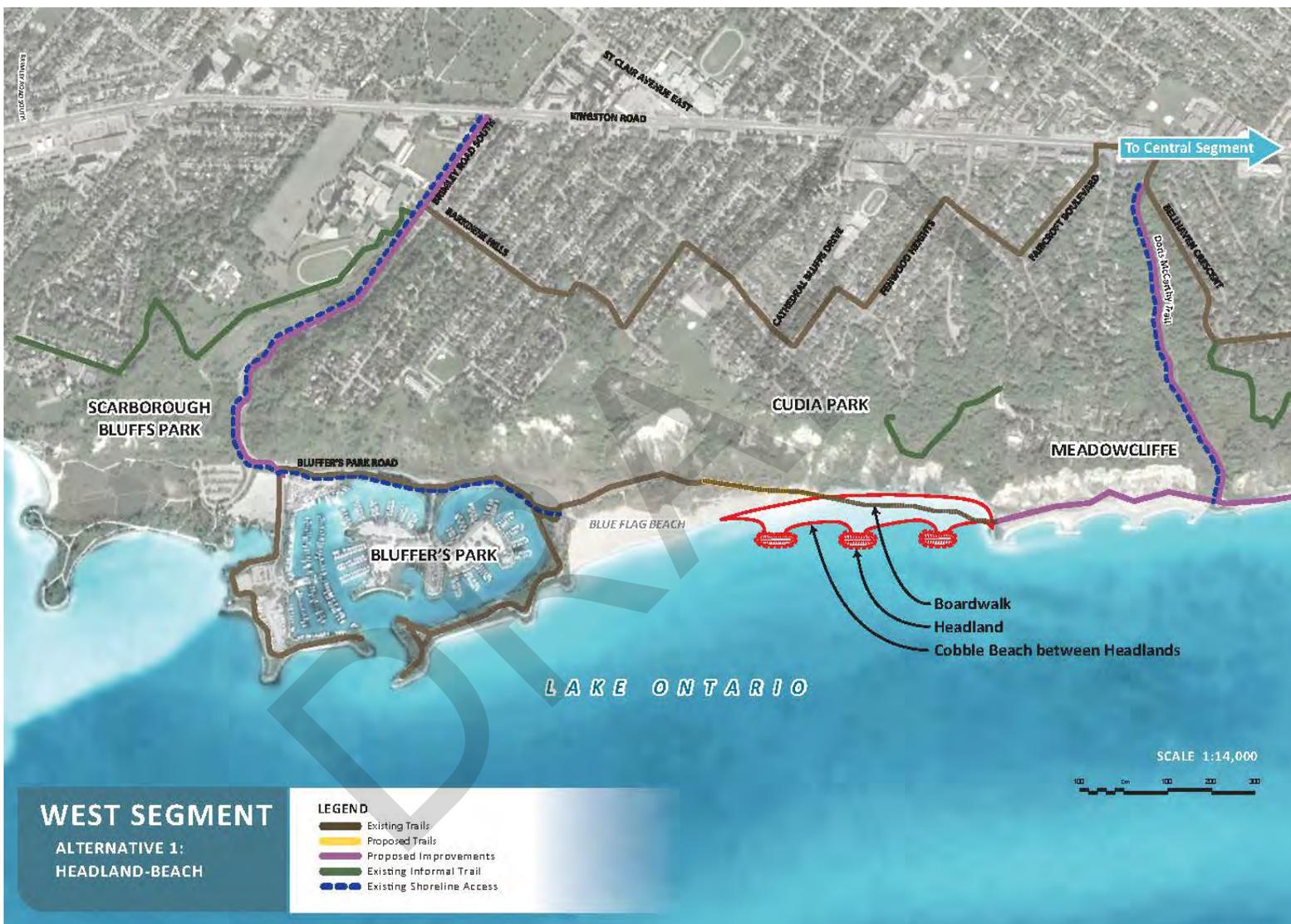


Figure 5-3 West Segment, Alternative 1: Headland Beach – Overview.



### 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, the placement of stone on the lake bottom without breaking the surface. The elevation of the bridge would be approximately 77.5 **meters 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).

Erosion of the Cudia Park shoreline would continue at a marginally lower rate than existing as the bluff begins to self-stabilize. Early stages of stabilization would be reached in 5-10 years after the construction of shoreline protection.

### 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 m<sup>2</sup> of infill and the long span Island Bridge would require approximately 9,000m<sup>2</sup> of infill.

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



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



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.

Erosion of the shoreline at 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 m<sup>2</sup> of infill. Sloped revetment would be used to reduce wave reflection. This Alternative would also include approximately five 135m long, 1.5m diameter Corrugated Steel Pipe (CSP) culverts to allow for the passage of water between the inner basin and the lake.

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. Erosion of the shoreline/toe of bluff will be nearly eliminated. Aquatic vegetation is likely to establish in the inner basin. The bluff would begin to self-stabilize, although crest migration would still occur while that process continues.

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.



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

Alternative 5A includes an expansion of the existing beach waterline 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 armourstone revetment that would extend into Lake Ontario by approximately 130 m. The area of infill required would be approximately 49,000 m<sup>2</sup>, 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 waterline 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 m<sup>2</sup> 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.



Figure 5-10 West Segment, Alternative 5B: Beach Expansion (Wide) – 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 & 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 road 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 approximate 130 m long headland is also proposed to the east at the base of the existing Guild Park and Gardens construction access road. 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 m<sup>2</sup>.

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

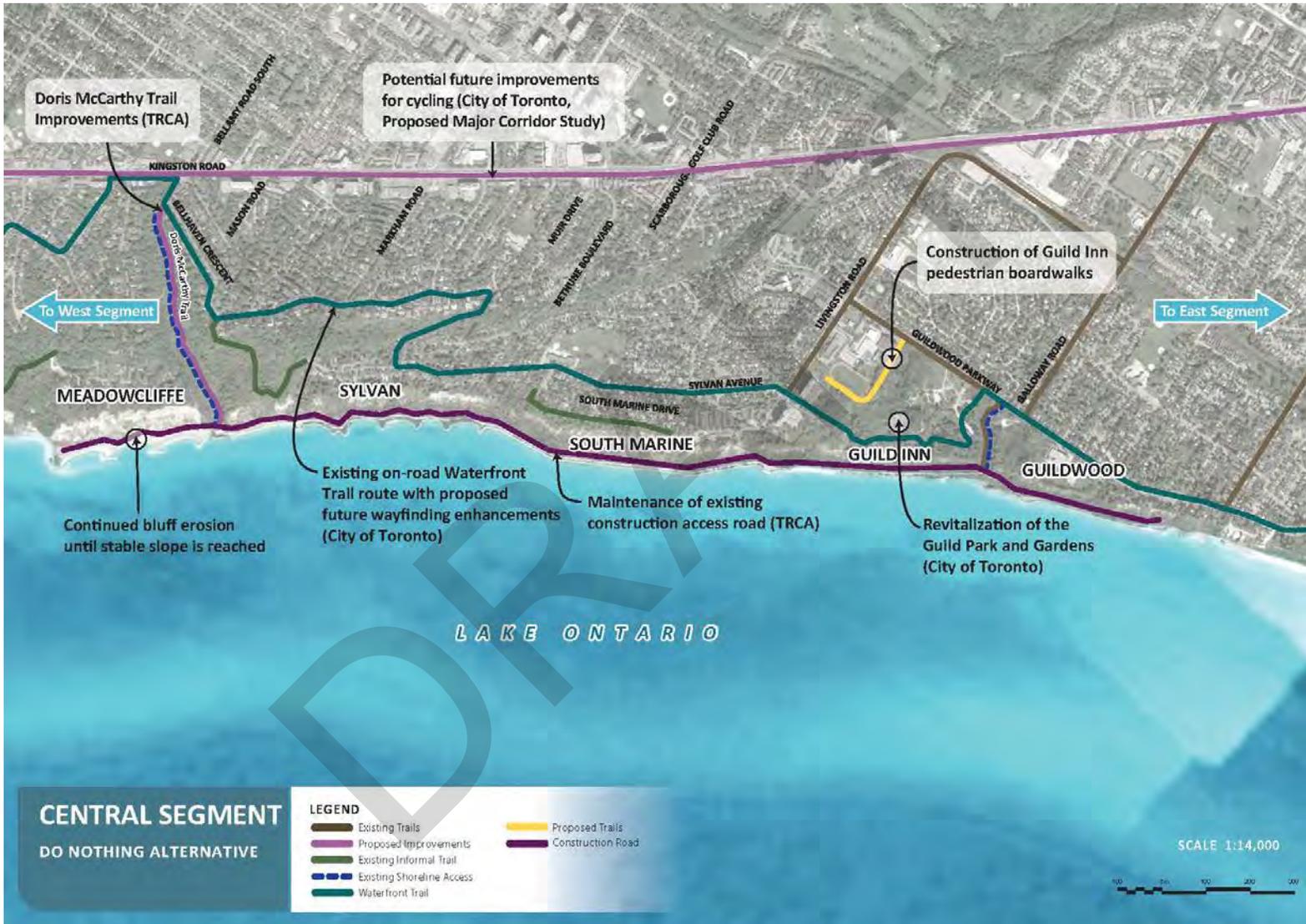


Figure 5-12 Central Segment, Alternative 1: Headland Beach – Overview.



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.

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*

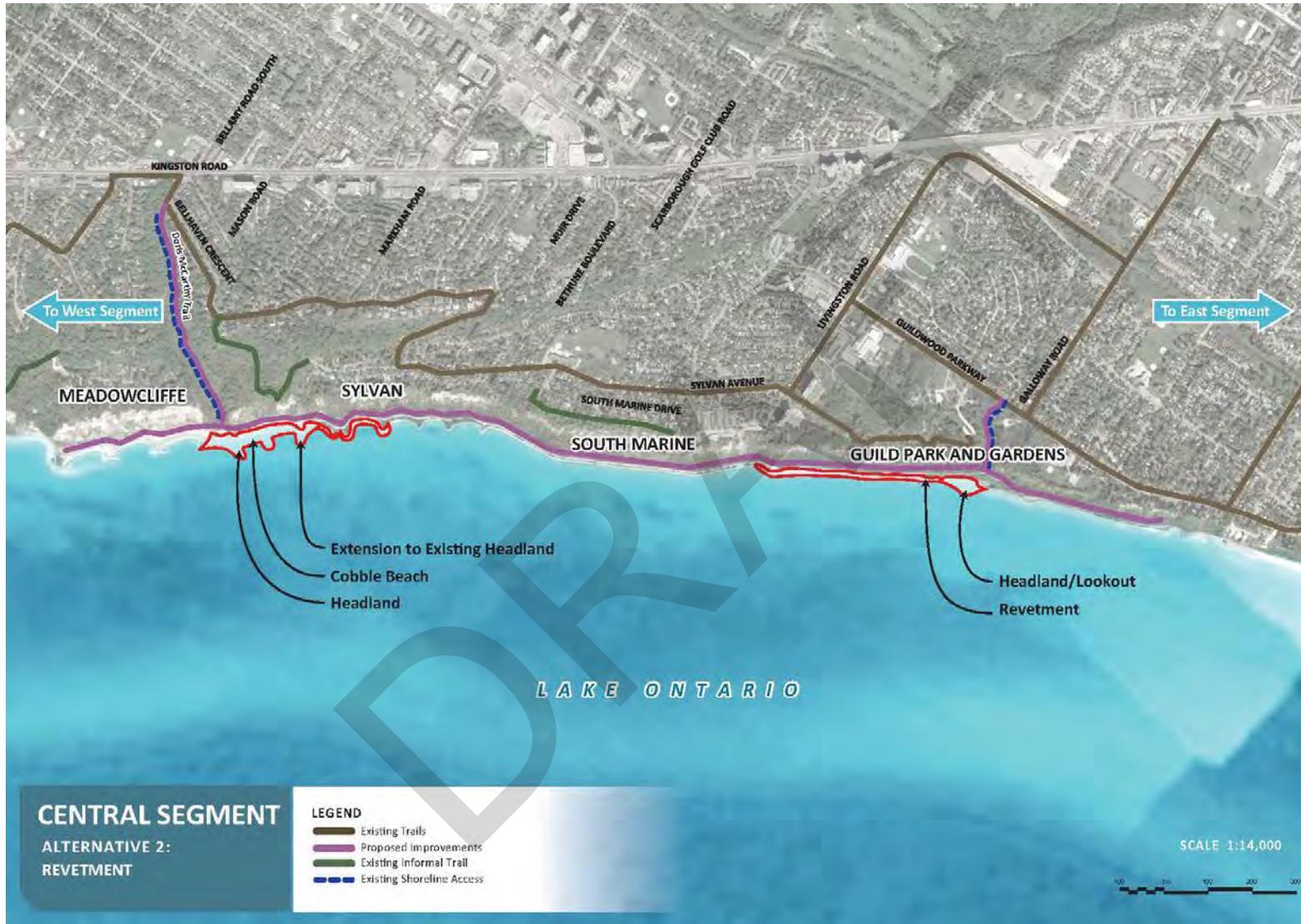
For the base of the Doris McCarthy Trail, the same new headland beach described for Central Segment, Alternative 1 is proposed (**Figure 5-13**). A revetment was also contemplated here but not pursued as it would appear out of place with the existing headland beaches on either side (Meadowcliffe and 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 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 m<sup>2</sup>.

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, but 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.

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



### 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 Alternatives, Do Nothing (Leave As is)

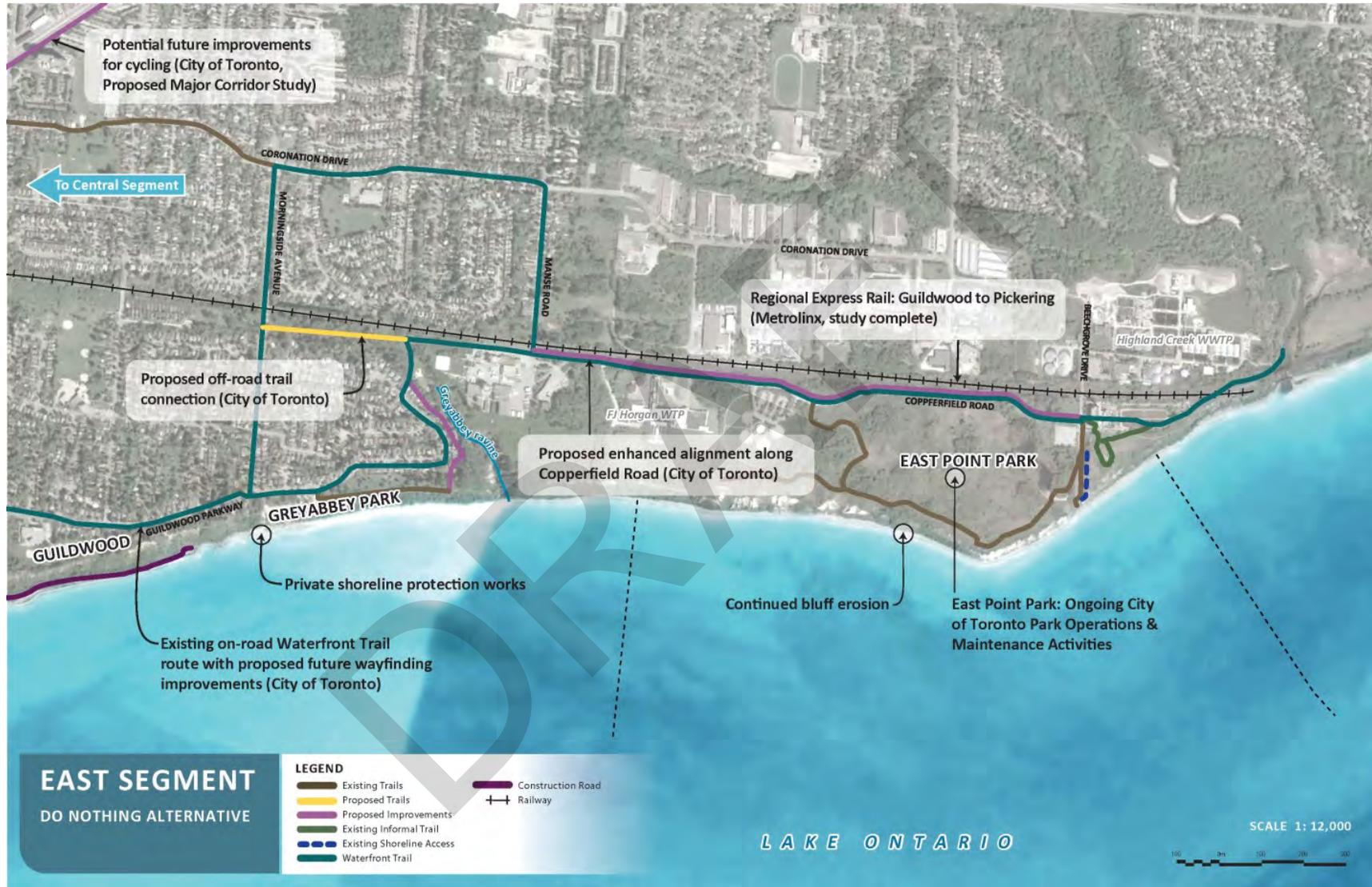
Under the “Do Nothing” Alternative there would be no changes to the existing shoreline. Throughout this section the bluff would continue to erode and tablelands above would be slowly lost through ongoing crest migration. Greyabbey Trail (e.g., road and associated infrastructure) would be at risk from 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.

Shoreline access along East Point Park will depend on lake levels, with higher lake levels restricting passage along the toe of the bluff. As many of the existing informal paths are within erosion gullies and previous slope failures, informal shoreline access will also depend on bluff erosion, and will remain informal and at risk. West of East Point Park the shoreline is not publicly accessible, as it is either under private ownership or associated with critical infrastructure (e.g., water treatment plant). To access the shoreline below Grey Abbey Park would require the crossing of private land or walking down Grey Abbey Ravine where no trail (formal or informal) exists, and there is exposure risk to the steep sided slopes of the ravine.

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, east on Coronation, 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.

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



### 5.3.3.2 East Segment Alternatives 1A/1B: Headlines 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**).

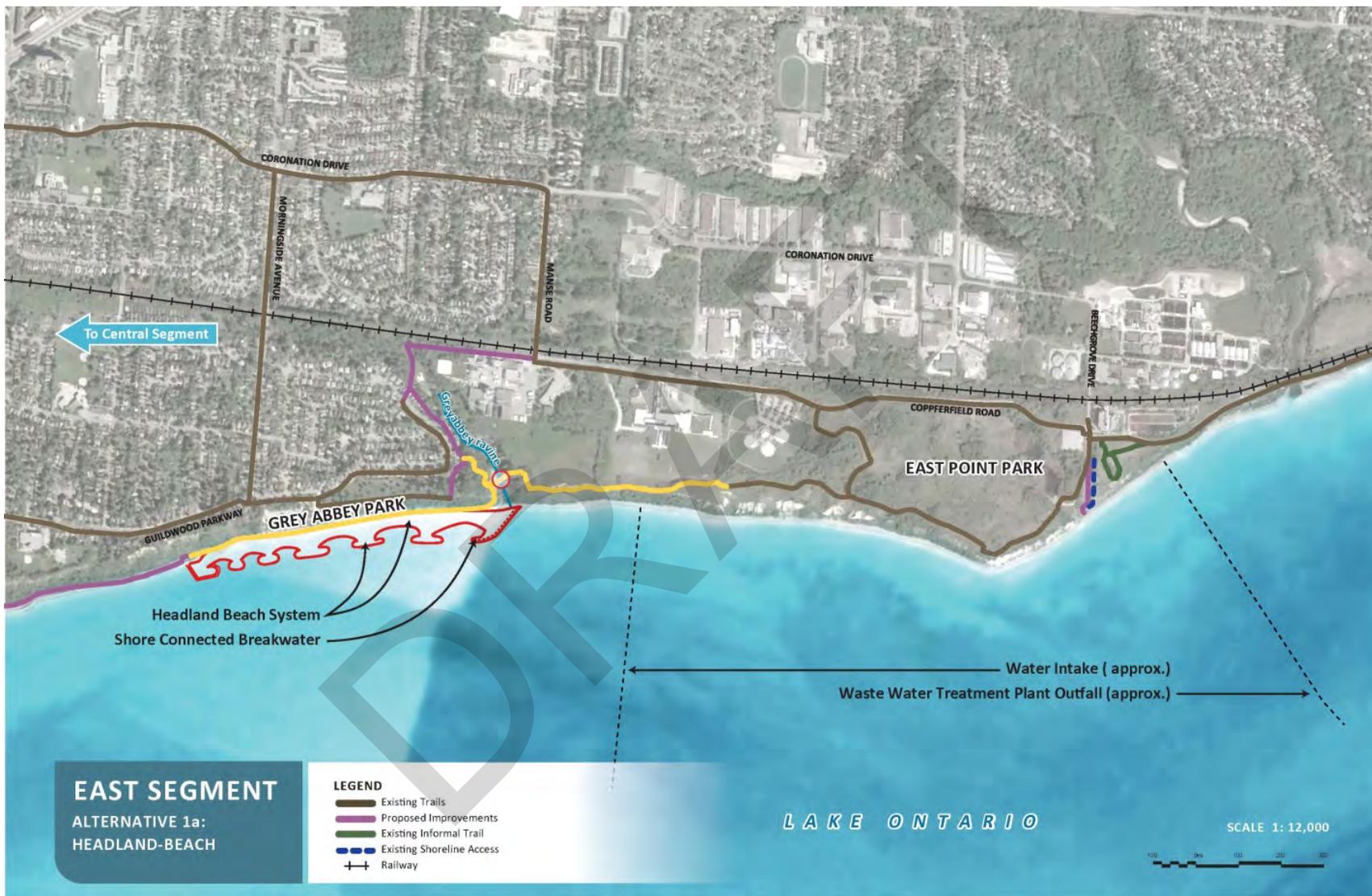
The headlands constructed parallel to the shore would vary in length from approximately 40 to 100 m and the easternmost headland, which curves back to shore, would be approximately 180 m long. The headlands would extend up to 80 m into the Lake. The area of infill required would be approximately 48,000 m<sup>2</sup>. 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.

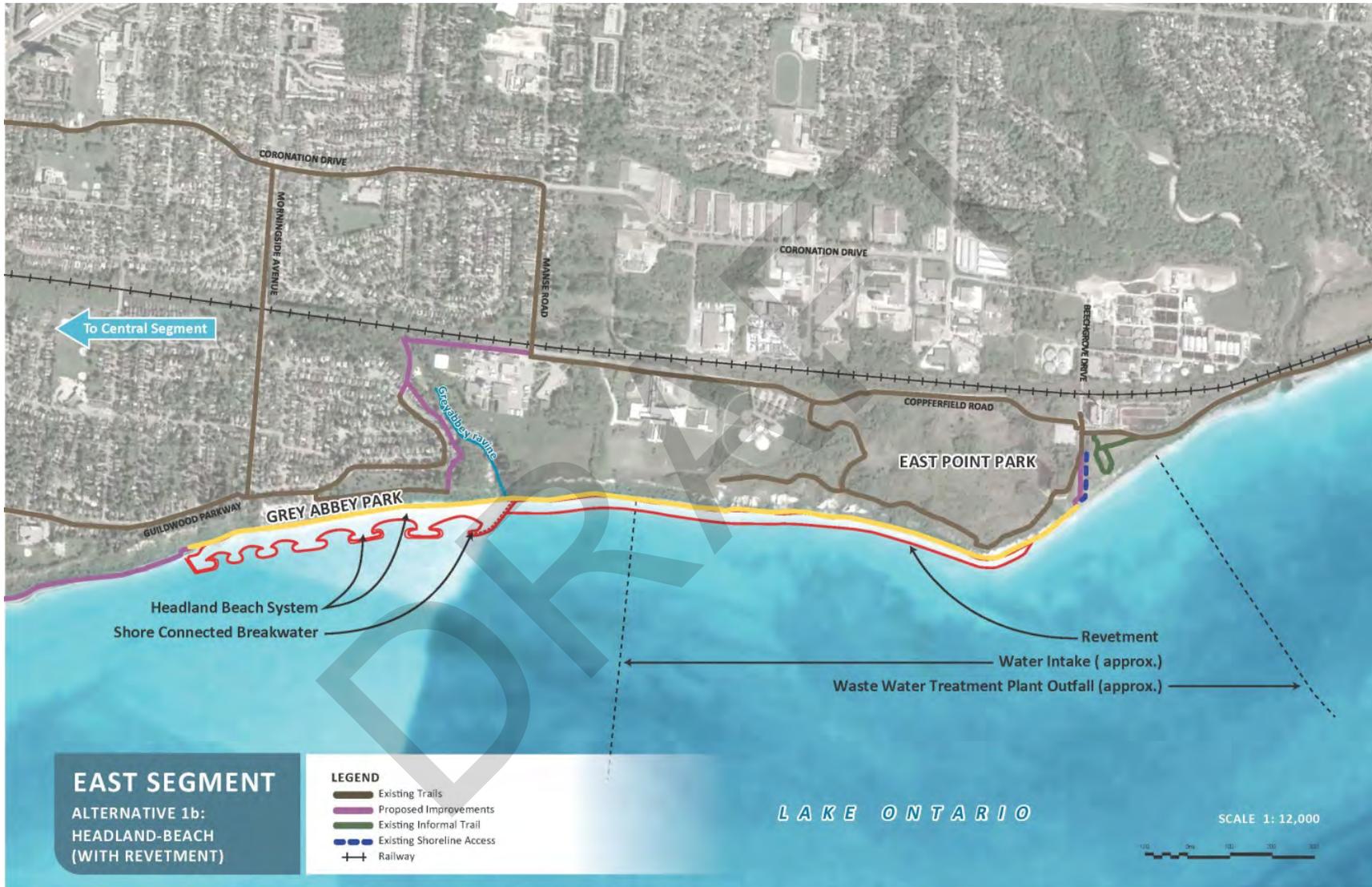
Alternative 1B is the same as Alternative 1A, but also incorporates an armourstone revetment along the shoreline from Grey Abbey Park to Beechgrove Drive (**Figure 5-16**). The revetment would protect the shoreline from Grey Abbey Park to East Point Park. The revetment would extend approximately 30 m 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 tablelands from the bottom of the ravine.

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

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



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



### 5.3.3.3 East Segment, Alternatives 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 approximate 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 m<sup>2</sup>. The eastern-most headland would extend to the eastern side of the 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.

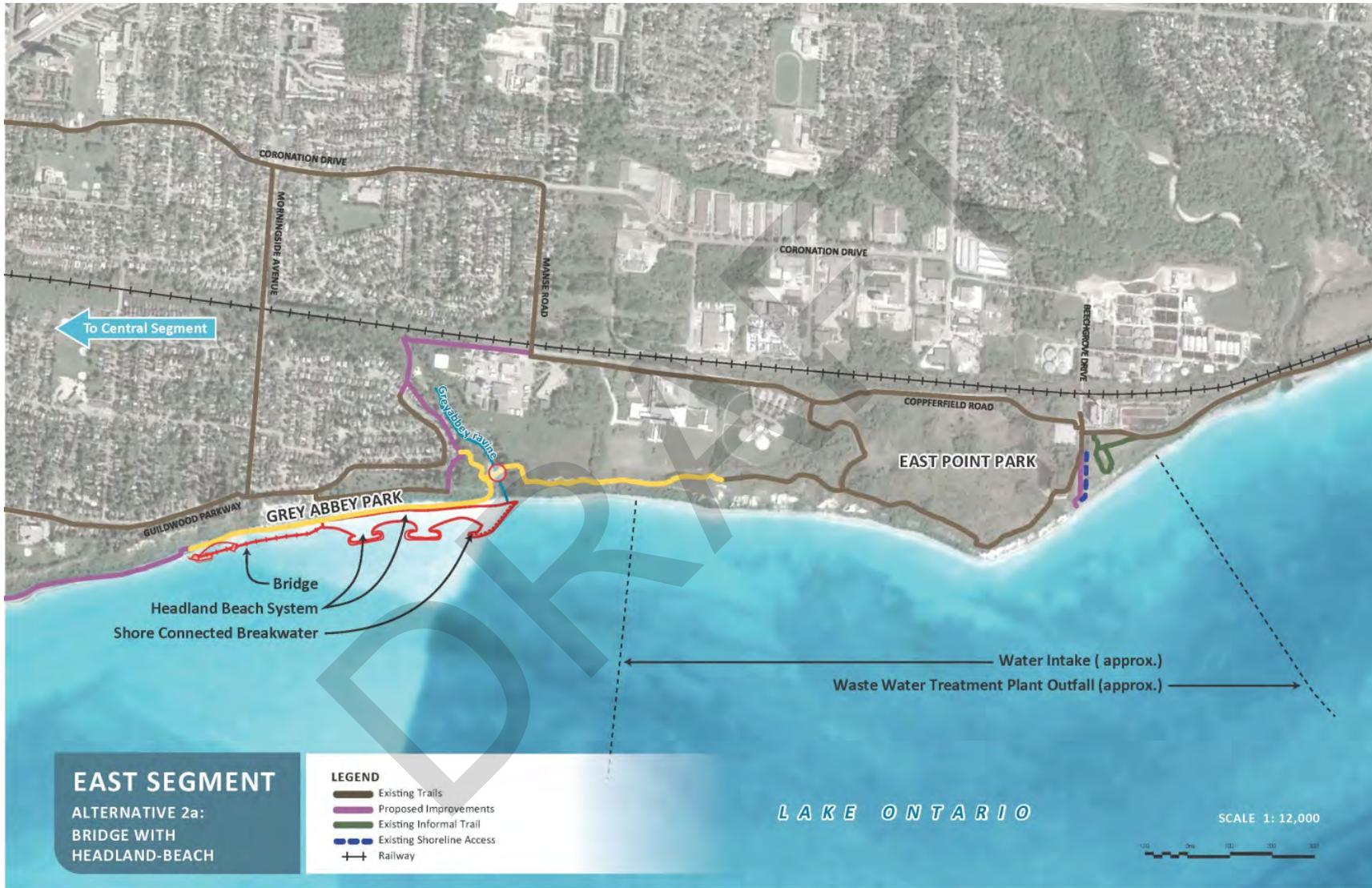
At the mouth of the Grey Abbey Ravine, a staircase structure would extend up to connect with a pedestrian/cyclist bridge that would pass over the ravine (about 100 m in length) and connect with a new trail that would run along the top of the bluff to connect with East Point Park.

Alternative 2B is the same as Alternative 2A, but also incorporates an armourstone revetment along the shoreline from Grey Abbey Park to East Point Park (**Figure 5-18**).

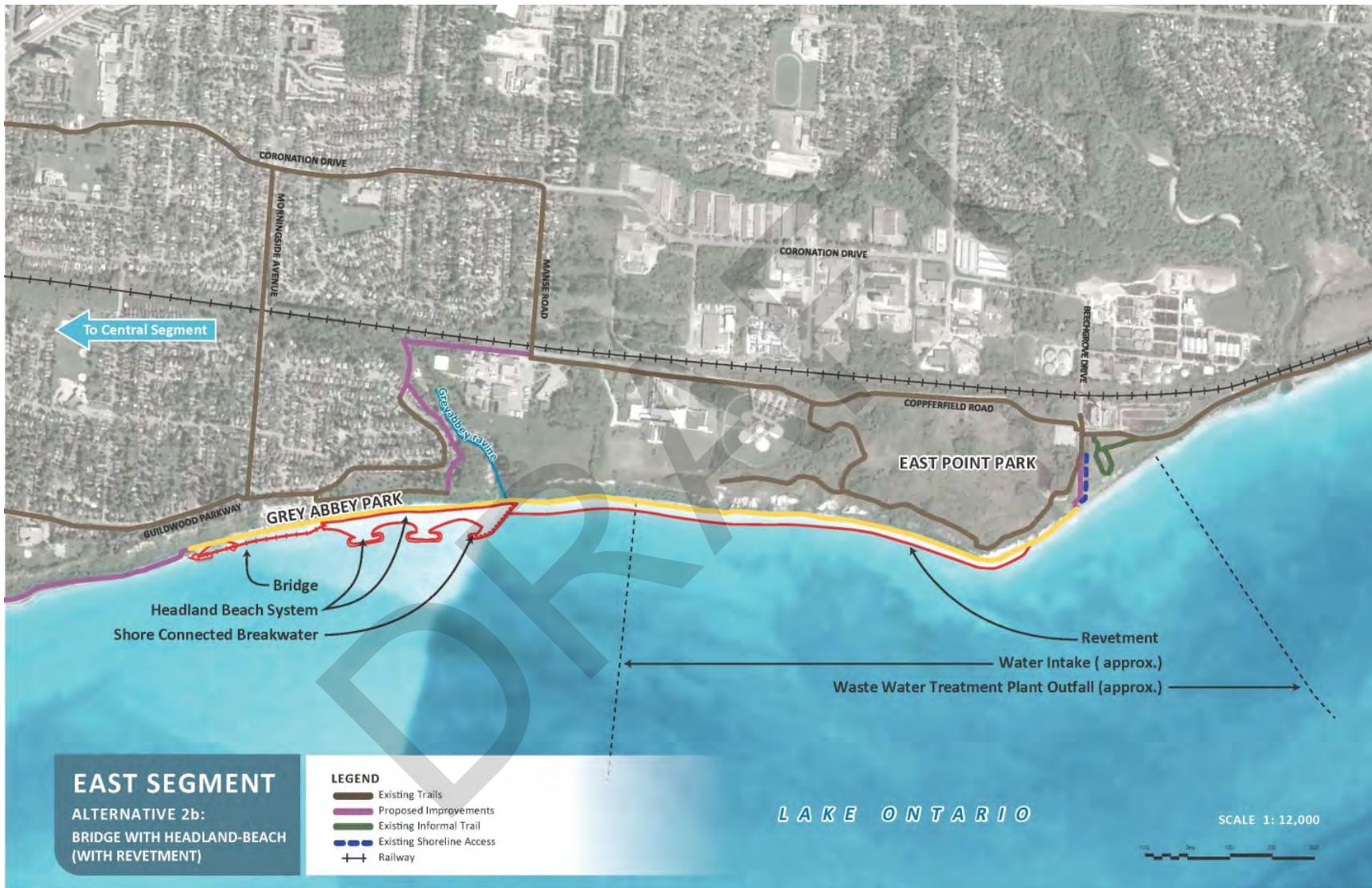
The revetment would protect the shoreline from Grey Abbey Park to Beechgrove Drive. The revetment would extend approximately 30 m offshore. To access the revetment at the east end, the Beechgrove Drive extension down to the water's edge would be improved and formalized.

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

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



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



#### 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 approximate 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 height, of approximately 79 MASL (4 m above typical lake level). The area of infill required would be approximately 48,000 m<sup>2</sup>. 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, that the “islands” would connect with the mainland.

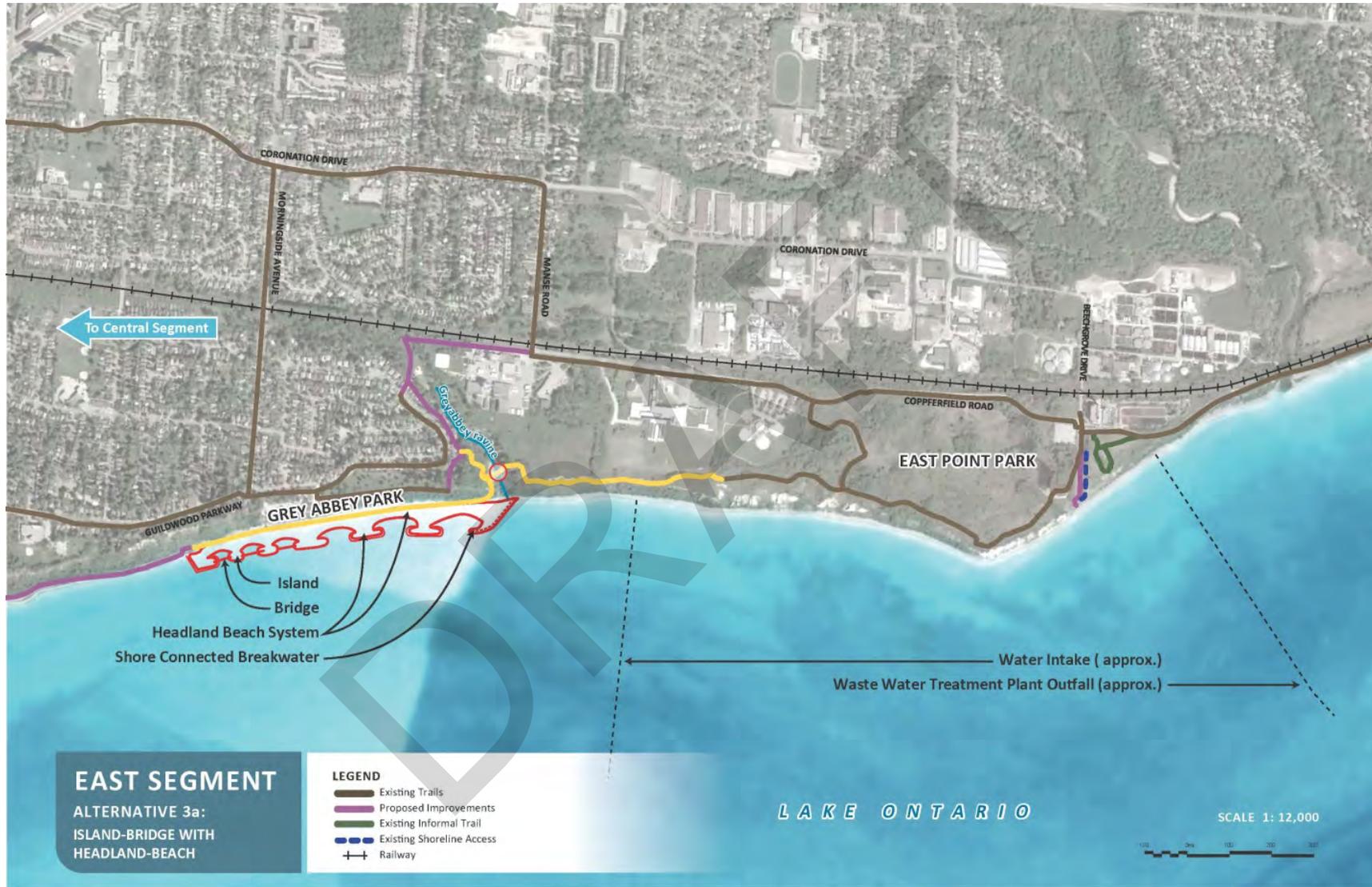
At the mouth of the Grey Abbey Ravine, a staircase structure would extend up to connect with a pedestrian/cycling bridge that would pass over the ravine (about 100 m in length) and connect with a new trail that would run along the top of the bluff to connect with East Point Park.

Alternative 3B is the same as East Segment, Alternative 3A, but also incorporates an armourstone revetment along the shoreline from Grey Abbey Park to East Point Park (**Figure 5-20**). The revetment would protect the shoreline from Grey Abbey Park to Beechgrove Drive. The revetment would extend approximately 30 m offshore.

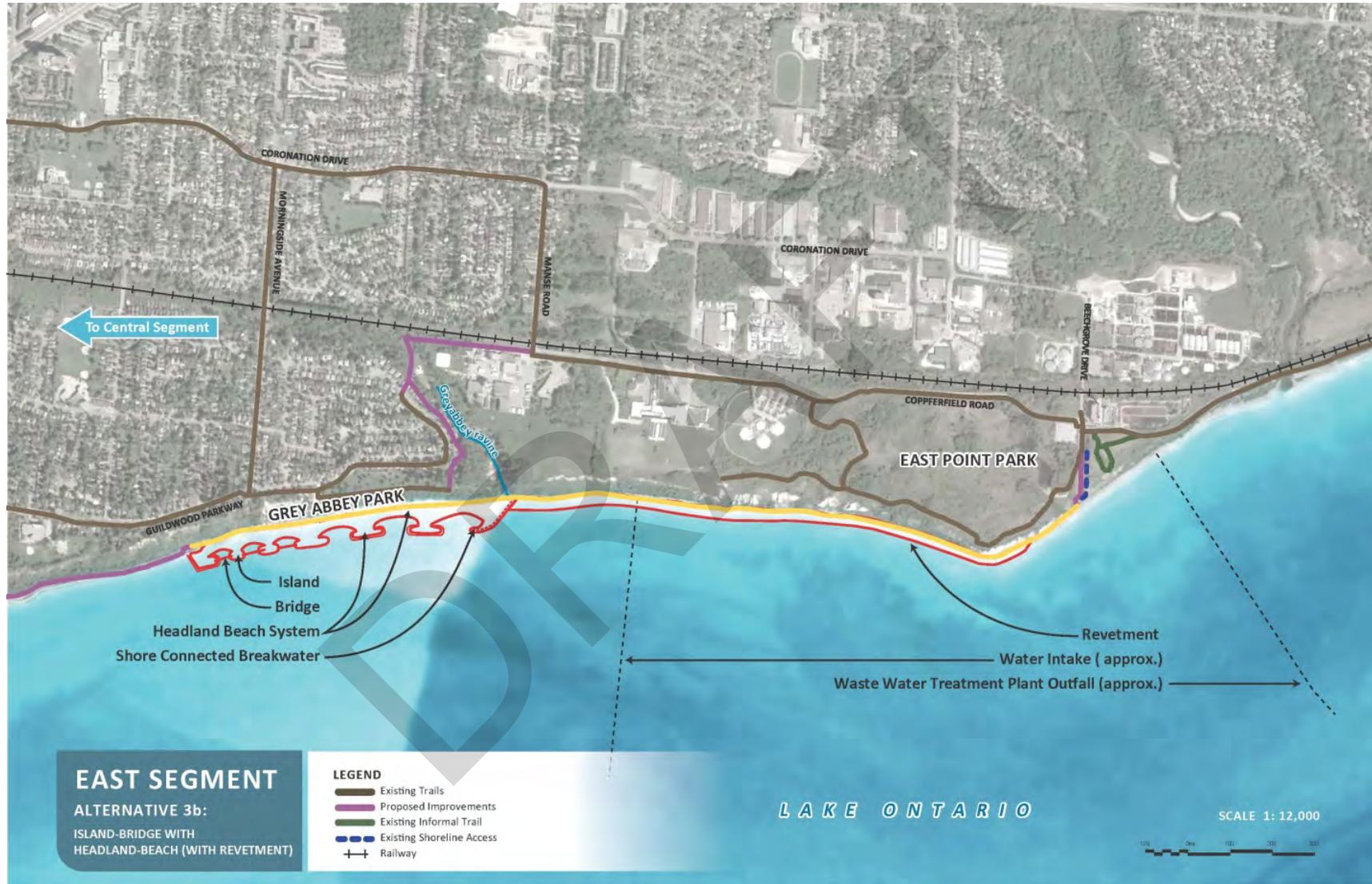
As a pedestrian and cycling trail would be possible along the full length of the shoreline behind the revetment, there would be no bridge crossing of the Grey Abbey Ravine and/or stairs up to the tablelands.

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

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



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



### 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 5-22**).

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 680 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 m<sup>2</sup>.

A trail would be possible along the length of the headland beach and revetment, with a formal tableland-waterfront connection approximately 750 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 5-21**, 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 m<sup>2</sup>.

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

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. The area of infill required would be approximately 86,000 m<sup>2</sup>. 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 750 m east of Grey Abbey Ravine south of the baseball diamonds at East Point Park.

**Figure 5-21** Proposed tableland connection 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 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 Bluff, 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 Bluff to connect with East Point Park (**Figure 5-24**).

Figure 5-22 East Segment, Alternative 4A: Headland Beach with Revetment to East Point Park – Overview.

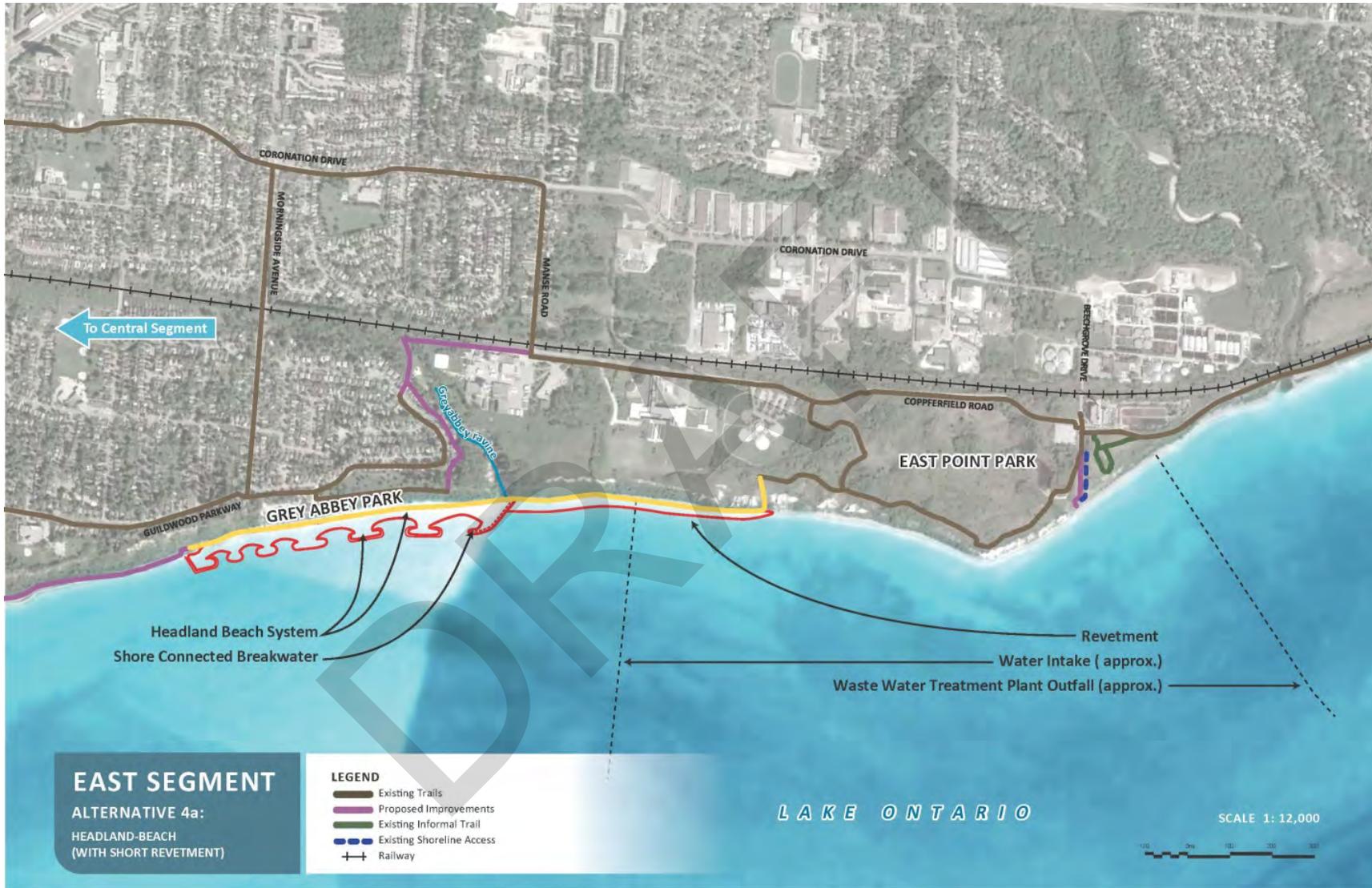
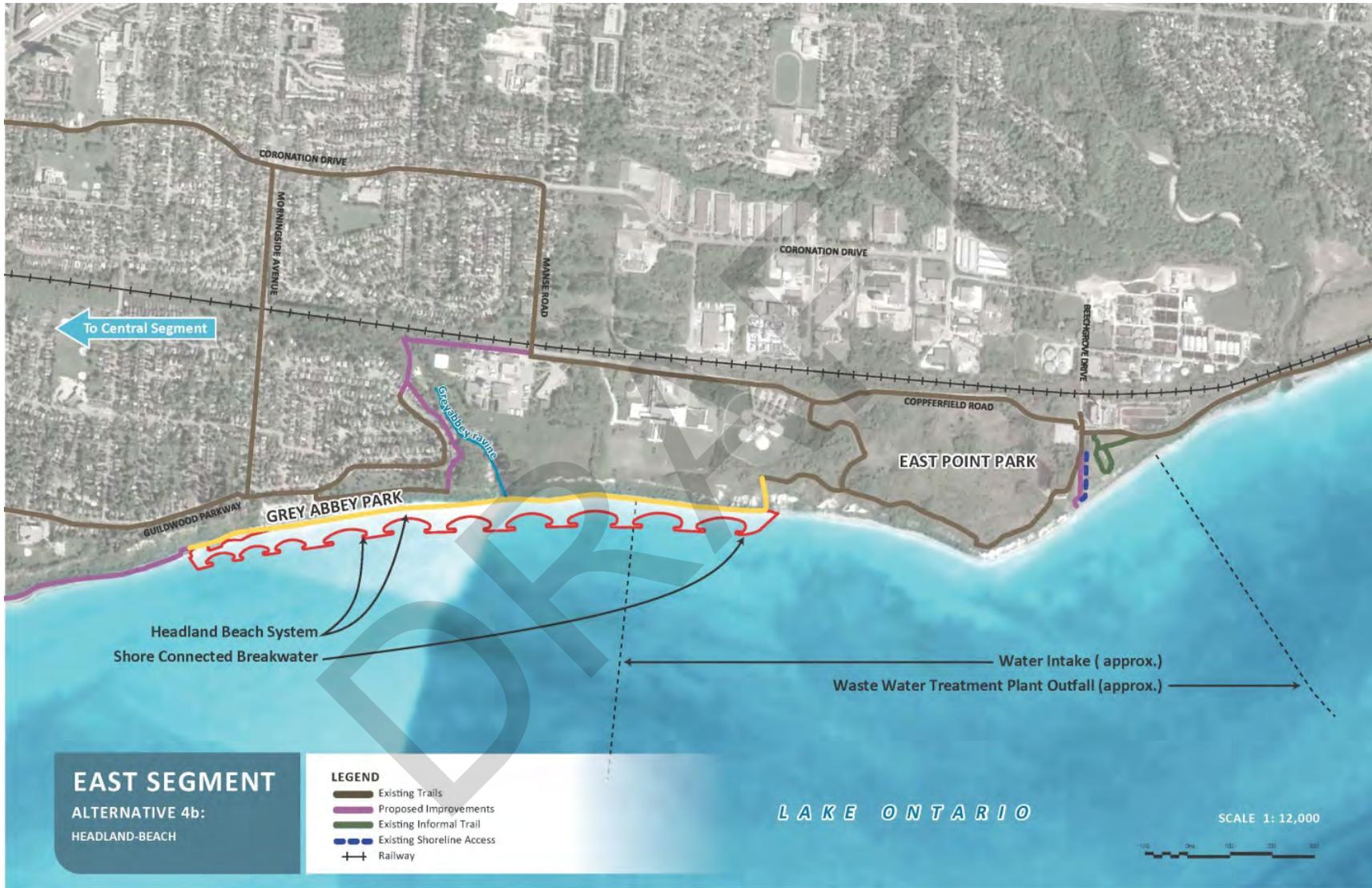
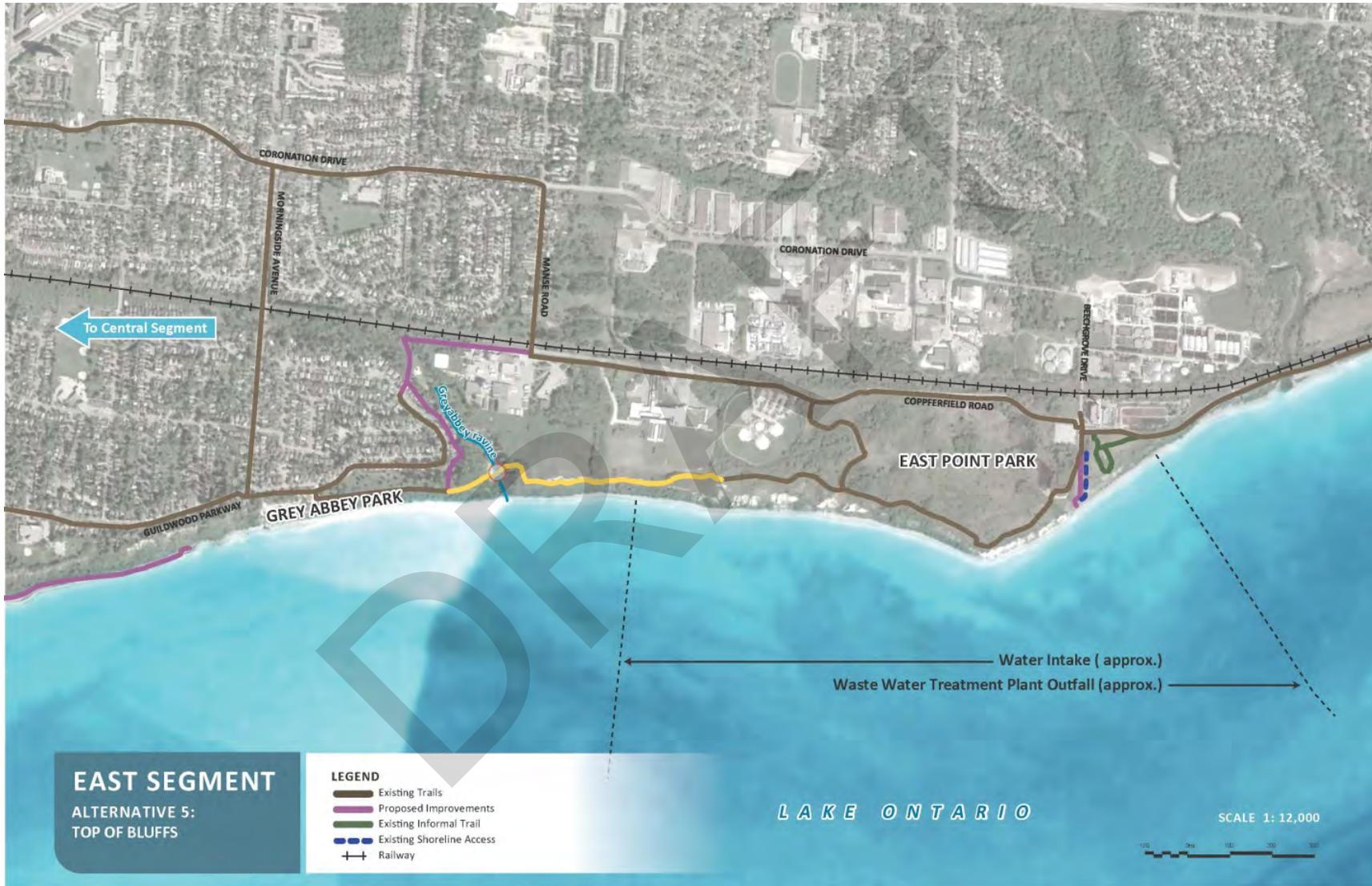


Figure 5-23 East Segment, Alternative 4B: Headland Beach to East Point Park – Overview.



**Figure 5-24** East Segment, Alternative 5: Tableland Connection Over Grey Abbey Ravine - Overview. Yellow Line Denotes Proposed Top of Bluff Trail.



## 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 effects (positive and negative) by indicator for each Alternative and determination of the Alternatives relative preference ranking 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.

#### 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;
- City of Toronto staff;
- Regulatory agencies;
- Stakeholder Committee;
- The public; and,
- 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 applicable impacts;
- the feature is not present in the Project Area; and,
- the Alternatives could not be distinguished for the criterion.

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 by segment and the rationale for the screening.

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

Objectives	Criteria	Indicators	Indicator Definitions	Ranking Measures
<b>Protect and Enhance Terrestrial and Aquatic Natural Features and Linkages</b>	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 Atlantic Salmon and American Eel) while providing optimal functional open coast habitat. In particular, a complex shoreline profile provides for increased foraging opportunities, cover, and shelter.	<ul style="list-style-type: none"> <li>• MP = Alternative that has the highest ability to increase shoreline morphology via increasing irregularity</li> <li>• P = Alternative with second-highest ability</li> <li>• IP = Alternative with second-lowest ability</li> <li>• LP = Alternative with lowest or no ability</li> </ul>
		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. Increase 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 Atlantic Salmon and American Eel, while providing optimal functional open coast habitat. In particular, increased shoreline substrate diversity provides more foraging, cover and shelter opportunities for fish.	<ul style="list-style-type: none"> <li>• MP = Alternative that has the highest ability to increase shoreline substrate type diversity</li> <li>• P = Alternative with second-highest ability</li> <li>• IP = Alternative with second-lowest ability</li> <li>• LP = Alternative with lowest or no ability</li> </ul>
		Potential for aquatic habitat loss or modification	Alternatives differ in terms of their overall <b>footprint</b> , 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.	<ul style="list-style-type: none"> <li>• MP = Alternative does not involve infill</li> <li>• P = Alternative involves a small amount of infill</li> <li>• IP = Alternative involves a medium to high amount of infill</li> <li>• LP = Alternative that involves the highest amount of infill</li> </ul>

Objectives	Criteria	Indicators	Indicator Definitions	Ranking Measures
	Extent of terrestrial habitat attributes enhanced or diminished	Potential to create appropriate <b>land-water interface</b>	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.	<ul style="list-style-type: none"> <li>• MP = Highest quality land water interface (highest ease of access and greatest length always out of water)</li> <li>• P = Intermediate quality land water interface</li> <li>• IP = Less quality land water interface</li> <li>• LP = Least quality land water interface</li> </ul>
		Impact to vegetation communities of concern (note: vegetation communities are key criteria for designation of ESAs and ANSIs)	Different Alternatives have varying impact on vegetation communities of concern. Vegetation communities provide habitat for both flora and faunal species.	<ul style="list-style-type: none"> <li>• MP = No negative impacts, potential for positive impacts on vegetation communities of conservation concern</li> <li>• P = No negative impacts</li> <li>• IP = Some negative impacts</li> <li>• LP = Most negative impacts</li> </ul>
	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.	<ul style="list-style-type: none"> <li>• MP = Least or no impacts on SAR</li> <li>• P = Intermediate degree impacts on SAR</li> <li>• IP = More amount/degree impacts on SAR</li> <li>• LP = Most amount and highest degree of impacts on SAR</li> </ul>
<b>Manage Public Safety and Property Risk</b>	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.	<ul style="list-style-type: none"> <li>• MP = Provides the highest degree of safe formal public access</li> <li>• P = Provides a relatively high degree of safe formal public access</li> <li>• IP = Provides an intermediate degree of safe formal public access</li> <li>• LP = Provides the lowest degree of safe formal public access</li> </ul>
		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 for risk for slope failure within the Study Area which can impact public property and infrastructure.	<ul style="list-style-type: none"> <li>• MP = Alternative eliminates risk to public property and infrastructure</li> <li>• P = Alternative is associated with risk to public property only</li> <li>• IP = Alternative is associated with risk to open space and public recreational amenities</li> <li>• LP = Alternative is associated with risk to public property and infrastructure</li> </ul>

Objectives	Criteria	Indicators	Indicator Definitions	Ranking Measures
	Improve Emergency Services access to the waterfront	Ability to provide additional Emergency Services access along the waterfront	Currently emergency services vehicles access to the shoreline is largely limited to Bluffer's Park along Brimley Road, to the shoreline between Meadowcliffe and Grey Abbey along the Guild construction 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.	<ul style="list-style-type: none"> <li>• MP = Allows for all vehicles to access entire Segment</li> <li>• P = Allows for some access to entire Segment</li> <li>• IP = Allows for limited access</li> <li>• LP = Does not allow access beyond existing extent of access</li> </ul>
	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.	<ul style="list-style-type: none"> <li>• MP = No potential for negative impacts</li> <li>• LP = Potential for negative impacts</li> </ul>
<b>Provide an Enjoyable Waterfront Experience</b>	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 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.	<ul style="list-style-type: none"> <li>• MP = Provides for continuous formal public access along the entire Segment</li> <li>• P = Provides for continuous formal public access along a large portion of the Segment</li> <li>• IP = Provides for continuous formal public access along a small portion of the Segment</li> <li>• LP = Provides the least amount of continuous formal public access along the Segment</li> </ul>
		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 hazard line within the Segment are preferred.	<ul style="list-style-type: none"> <li>• MP = Accommodates a multi-use trail that meets primary trail to high-capacity standard within the entire Segment</li> <li>• P = Accommodates a multi-use trail, where only a small portion does not meet primary to high-capacity trail standard</li> <li>• IP = Accommodates a multi-use trail, where a medium to large portion does not meet primary to high-capacity trail standard</li> <li>• 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</li> </ul>
		Ability to meet AODA grade standard	Improved access along the shoreline includes opportunities to provide physical AODA accessibility. Alternatives which are better able to accommodate a suitable grade are preferred.	<ul style="list-style-type: none"> <li>• MP = Potential to meet AODA grade standard along full length</li> <li>• P = Potential to meet AODA grade standard along most of the length</li> <li>• IP = AODA grade standard met along least of the length</li> <li>• LP = AODA grade standard cannot be met</li> </ul>

Objectives	Criteria	Indicators	Indicator Definitions	Ranking Measures
		Ability to provide formal direct public access to the water	The public desires opportunities for direct access to the water. Alternatives that provide direct access to the water are more preferred.	<ul style="list-style-type: none"> <li>• MP = Provides formal direct access to the water over the greatest length</li> <li>• P = Provides formal direct access to the water over second-greatest distance</li> <li>• IP = Provides formal direct access to the water over the second-shortest distance</li> <li>• LP = Does not provide for formal direct access to the water, or provides the least amount of direct access</li> </ul>
	Potential for changes to the use of the waterfront for recreation	Potential for change in character of sandy shorelines	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.	<ul style="list-style-type: none"> <li>• MP = No negative impact anticipated to the character of existing sand shoreline; and opportunities for enhancements</li> <li>• P = No negative impact to character of existing sand shoreline</li> <li>• IP = Minor negative impact to character of existing sand shoreline</li> <li>• LP = Significant negative impact to character of existing sand shoreline</li> </ul>
		Potential impacts to the Blue Flag Beach at Bluffer's Park	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.	<ul style="list-style-type: none"> <li>• MP = No potential to increase the number of beach closures per season</li> <li>• LP = Potential to increase the number of beach closures</li> </ul>
		Potential for impact on navigation and boating infrastructure	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.	<ul style="list-style-type: none"> <li>• MP = High Potential to reduce sedimentation and therefore dredging requirements in the entrance to Bluffer's Park boat basin</li> <li>• P = Medium potential to reduce sedimentation</li> <li>• IP = Low potential</li> <li>• LP = No potential</li> </ul>

Objectives	Criteria	Indicators	Indicator Definitions	Ranking Measures
<b>Consistency and Coordination with Other Initiatives</b>	Ability to integrate with City and other agency plans and initiatives	Ability to integrate with new and proposed plans or initiatives	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.	<ul style="list-style-type: none"> <li>• MP = Provides highest ability to accommodate other plans and initiatives</li> <li>• P = Provides opportunity to accommodate other plans and initiatives</li> <li>• IP = Provides intermediate opportunity to accommodate other plans and initiatives</li> <li>• LP = Provides the least opportunity to accommodate other plans and initiatives</li> </ul>
		Consistency with the goals of the Fish Community Objectives for Lake Ontario	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.	<ul style="list-style-type: none"> <li>• MP = Provides additional contributions to advancement of applicable objectives</li> <li>• LP = Does not provide additional contributions to the advancement of applicable objectives</li> </ul>
		Consistency with the goals and objectives of the Management Plan for Guild Park and Gardens	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.	<ul style="list-style-type: none"> <li>• MP = Most consistent with the Guild Park and Gardens Management Plan</li> <li>• P = Consistent with the Guild Park and Gardens Management Plan (meets most objectives)</li> <li>• IP = Consistent with the Guild Park and Gardens Management Plan (meets some objectives)</li> <li>• LP = Least consistent with the Guild Park and Gardens Management Plan (does not meet any objectives)</li> </ul>
		Consistency with the objectives of Bikeway Trails Implementation Plan	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.	<ul style="list-style-type: none"> <li>• MP = Consistent with the objectives of the Bikeway Trails Implementation Plan.</li> <li>• LP = Not consistent with the objectives of the Bikeway Trails Implementation Plan.</li> </ul>
		Consistency with the Integrated Shoreline Management Plan	The 1996 Integrated Shoreline Management Plan (ISMP) identified a series of recommendations for the Project Area.	<ul style="list-style-type: none"> <li>• MP = Consistent with the objectives of the Integrated Shoreline Management</li> <li>• LP = Not consistent with the objectives of the Integrated Shoreline Management Plan.</li> </ul>

Objectives	Criteria	Indicators	Indicator Definitions	Ranking Measures
	Compatibility with existing land uses	Compatibility with existing land use (industrial)	Industrial land uses exist within the Project Study Area. Alternatives which minimize impacts on existing industrial areas are more preferred.	<ul style="list-style-type: none"> <li>• MP = Most compatible with existing industrial land</li> <li>• P = Compatible with existing industrial land</li> <li>• IP = Somewhat compatible with existing industrial land</li> <li>• LP = Least compatible with surrounding industrial land use</li> </ul>
		Compatibility with existing land use (residential)	Residential land uses exist within the Project Study Area. Alternatives which minimize impacts on existing residential areas are more preferred.	<ul style="list-style-type: none"> <li>• MP = Most compatible with existing residential land</li> <li>• P = Compatible with existing residential land</li> <li>• IP = Somewhat compatible with existing residential land</li> <li>• LP = Least compatible with surrounding residential land use</li> </ul>
	Potential impact on archaeological resources, built heritage resources, and cultural heritage landscapes	Potential to impact known or potential archaeological sites	Impacts to archaeological resources (terrestrial and/or marine) need to be minimized or mitigated. Alternatives that best achieve this will be considered as preferred.	<ul style="list-style-type: none"> <li>• MP = Will not impact any known or potential archaeological resources</li> <li>• P = Has potential to impact archaeological resources but mitigation would be possible</li> <li>• IP = Low potential to impact archaeological resources, mitigation possible</li> <li>• LP = Will impact archaeological resources and cannot be effectively mitigated</li> </ul>
		Potential for impact on traditional land uses and valued cultural features	Is it 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.	<ul style="list-style-type: none"> <li>• MP = Will not impact on traditional land uses and valued cultural features</li> <li>• P = Has potential to impact traditional land uses and valued cultural features</li> <li>• IP = Low potential to impact traditional land uses and valued cultural features</li> <li>• LP = Will impact traditional land uses and valued cultural features</li> </ul>
		Potential to impact known built heritage sites, and cultural heritage landscapes	Impacts to built heritage and cultural heritage landscapes need to be minimized. Alternatives that best achieve this will be considered as preferred.	<ul style="list-style-type: none"> <li>• MP = Will not impact known built heritage sites and cultural heritage landscapes.</li> <li>• P = Has potential to impact known built heritage sites and cultural heritage landscapes.</li> <li>• IP = Low potential to impact known built heritage sites and cultural heritage landscapes.</li> <li>• LP = Will impact known built heritage sites and cultural heritage landscapes.</li> </ul>

Objectives	Criteria	Indicators	Indicator Definitions	Ranking Measures
<b>Achieve Value for Cost</b>	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.	<ul style="list-style-type: none"> <li>• MP = Lowest construction cost</li> <li>• P = Low intermediate construction cost</li> <li>• IP = High intermediate construction cost</li> <li>• LP = Highest construction cost</li> </ul>
		Potential amount of waterlot and property acquisition required (relative to each other)	Some Alternatives could require Crown waterlots (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 waterlots and private property are Preferred.	<ul style="list-style-type: none"> <li>• MP = Will not require private property or Crown waterlots</li> <li>• P = Will require the least amount of private property parcels and/or Crown waterlots</li> <li>• IP = Will require a greater amount of private property parcels and/or Crown waterlots</li> <li>• LP = Will require the greatest amount of private property parcels and/or Crown waterlots</li> </ul>
	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.	<ul style="list-style-type: none"> <li>• MP = Lowest maintenance and operations costs</li> <li>• P = Low intermediate maintenance and operation cost</li> <li>• IP = High intermediate maintenance and operation costs</li> <li>• LP = Highest maintenance and operation costs</li> </ul>

**Table 5-2** Criteria and Indicators Screened 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 Coordination 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 sites, and cultural heritage landscapes	Same for all Alternatives. There are no impacts to the built heritage sites 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 Coordination 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

Segment	Objective	Criteria	Indicator	Rationale
		Potential impact on archaeological resources, built heritage resources, and cultural heritage landscapes	Potential to impact known or potential archaeological sites	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 sand 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 coordination 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 Coordination 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

#### 5.4.1.2 Effects Assessment and Ranking

Each Alternative within each Segment was then 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 potentially 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).

The evaluation of 'Alternative Methods' was structured to assess the ability of each Alternative to meet the Project Vision and Objectives. As an overall objective, the Preferred Alternative is to result in an overall net benefit over the "Do Nothing" Alternative to the environment and community. For the purpose of this evaluation, the effects associated with construction were considered to be similar to each Alternative and generally could be mitigated using standard construction practices. As construction effects did not help to distinguish among the Alternatives, effects from construction were not included in the evaluation.

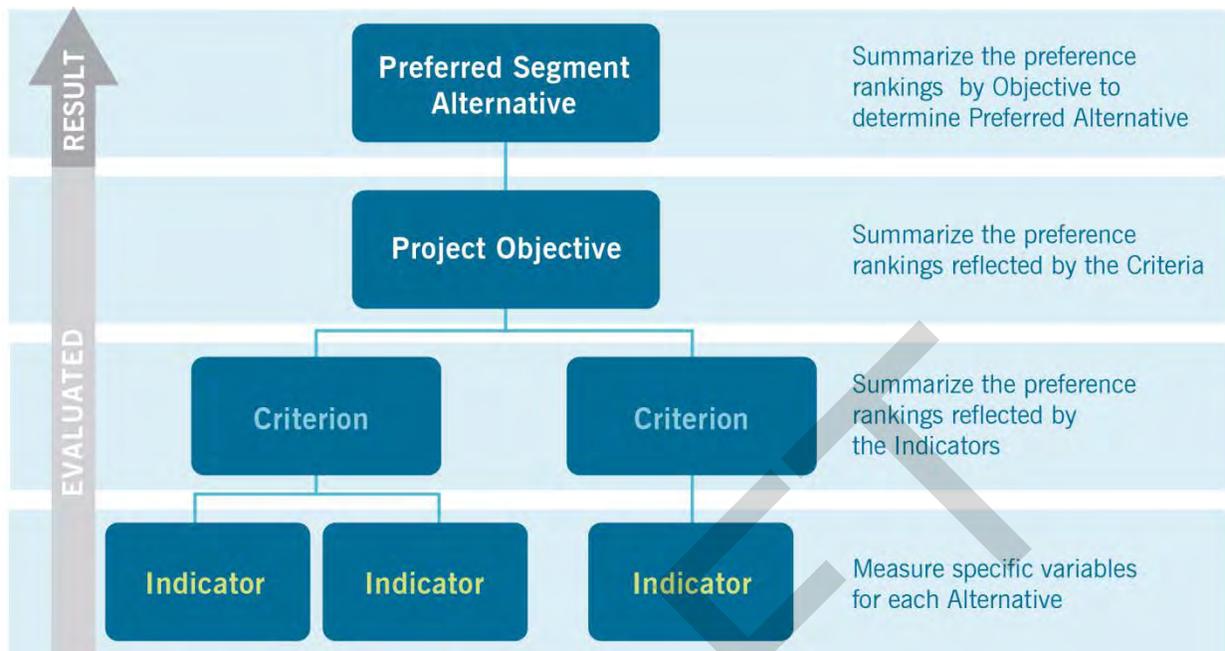
Once the effects assessment was completed, the Alternatives were ranked relative to each other on the basis of the following scale: Most Preferred, Preferred, Intermediate Preferred, and Least Preferred. The rationale for each level of ranking for each indicator is presented in **Table 5-1** above. In 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. 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 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 study objectives. **Figure 5-25** illustrates this process.

**Figure 5-25** Alternatives Comparative Evaluation 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 study 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.

#### 5.4.2 Evaluation Results – West Segment

The following presents the comparative evaluation results for the West Segment. The evaluation is organized by study objective and presents the tradeoffs that were made considering the Alternative assessment results 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 plus the “Do Nothing” Alternative were assessed in the West Segment as described previously in **Section 5.3.1**.

## 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 ecological 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 5-3** 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. 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-Bridge) and Alternative 5B (Wide Beach) as these Alternatives provides potential for the expansion of existing sand dune communities (by enlarging the existing sand beach) and results 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, while 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).

**Table 5-3** West Segment, Objective #1 Criteria Level Evaluation Summary.

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1 (Headland Beach)	Alternative 2A (Short Span Bridge)	Alternative 2B (Long Span Bridge)	Alternative 3A (Short Span Island-Bridge)	Alternative 3B (Long Span Island-Bridge)	Alternative 4 (Causeway)	Alternative 5A (Narrow Beach + Bridge)	Alternative 5B (Wide Beach)
Protect and Enhance Terrestrial and Aquatic Natural Features and Linkages	Extent of aquatic habitat enhanced or diminished	<ul style="list-style-type: none"> <li>Ability to increase shoreline morphology by increasing shoreline irregularity</li> <li>Ability to increase shoreline substrate type diversity</li> <li>Potential for aquatic habitat loss or modification</li> </ul>	<b>Intermediate Preferred</b> No fill, but no improvement in morphology or substrate type diversity, relative to the other Alternatives.	<b>Preferred</b> High amount of fill (40,000 m <sup>2</sup> ). 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.	<b>Intermediate Preferred</b> Minor amount of fill. No increase in morphology as shoreline irregularity remains the same. No improvement to shoreline substrate type diversity.	<b>Intermediate Preferred</b> Minor amount of fill. No increase in morphology as shoreline irregularity remains the same. No improvement to shoreline substrate type diversity.	<b>Preferred</b> Moderate amount of fill (12,000 m <sup>2</sup> ). 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.	<b>Intermediate Preferred</b> Moderate amount of fill (9,000 m <sup>2</sup> ). 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.	<b>Intermediate Preferred</b> Moderate amount of fill (15,000 m <sup>2</sup> ). 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.	<b>Intermediate Preferred</b> High amount of fill (49,000 m <sup>2</sup> ). Increase in morphology through a 30% increase in shoreline irregularity. Some improvement to shoreline substrate type diversity through a moderate increase in boulder substrate, relative to the previously existing sand-dominated substrate.	<b>Preferred</b> Highest amount of fill (109,000 m <sup>2</sup> ). 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 substrate, relative to the previously existing sand-dominated substrate.
	Extent of terrestrial habitat attributes enhanced or diminished	<ul style="list-style-type: none"> <li>Potential to create appropriate land-water interface</li> <li>Impact to vegetation communities of concern</li> </ul>	<b>Preferred</b> No improvement to land water interface. No impacts to vegetation communities of concern.	<b>Preferred</b> Positive changes to land water interface through a 15% increase in shoreline length that provides an interface that is always out of the water. Moderate temporary impacts to ~3,500 m <sup>2</sup> of beach vegetation communities of concern.	<b>Intermediate Preferred</b> No improvement to land water interface. Low temporary impacts to ~400 m <sup>2</sup> of beach vegetation communities of concern.	<b>Intermediate Preferred</b> No improvement to land water interface. Low temporary impacts to ~400 m <sup>2</sup> of beach vegetation communities of concern.	<b>Intermediate Preferred</b> No improvement to land water interface. Low temporary impacts to ~300 m <sup>2</sup> of beach vegetation communities of concern.	<b>Intermediate Preferred</b> No improvement to land water interface. Low temporary impacts to ~200 m <sup>2</sup> of beach vegetation communities of concern.	<b>Least Preferred</b> Negative change in land water interface through a 20% reduction in shoreline length that provides an interface that is always out of water. Greatest permanent negative impacts (i.e., loss) to ~2,300 m <sup>2</sup> of beach vegetation communities of concern.	<b>Most Preferred</b> Greatest improvement to land water interface through a 30% increase in shoreline length that provides an interface that is always out of the water. Alternative provides potential for spread of existing sand dune communities (by enlarging existing sand beach).	<b>Most Preferred</b> Greatest improvement to land water interface through a 30% increase in shoreline length that provides an interface that is always out of water. Alternative provides potential for spread of existing sand dune communities (by enlarging existing sand beach).
<b>Objective-Level Ranking</b>			<b>Intermediate Preferred</b>	<b>Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Least Preferred</b>	<b>Preferred</b>	<b>Most Preferred</b>

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.

## **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**.

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 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 shore 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 provides for full emergency access.

**Table 5-4** West Segment, Objective #2 Criteria Level Evaluation Summary.

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1 (Headland Beach)	Alternative 2A (Short Span Bridge)	Alternative 2B (Long Span Bridge)	Alternative 3A (Short Span Island-Bridge)	Alternative 3B (Long Span Island-Bridge)	Alternative 4 (Causeway)	Alternative 5A (Narrow Beach + Bridge)	Alternative 5B (Wide Beach)
<b>Manage Public Safety and Property Risk</b>	Ability to minimize public safety risk and property loss as a result of slope erosion/failure	<ul style="list-style-type: none"> <li>Ability to provide a trail lakeward of risk line along the shoreline and shoreward of the risk line along the top of the bluff</li> </ul>	<b>Least Preferred</b> Cannot effectively minimize public safety risk.	<b>Most Preferred</b> Effectively minimizes risk to public safety (trail outside of risk line).	<b>Most Preferred</b> Effectively minimizes risk to public safety (trail outside of risk line).	<b>Most Preferred</b> Effectively minimizes risk to public safety (trail outside of risk line).	<b>Most Preferred</b> Effectively minimizes risk to public safety (trail outside of risk line).	<b>Most Preferred</b> Effectively minimizes risk to public safety (trail outside of risk line).	<b>Most Preferred</b> Effectively minimizes risk to public safety (trail outside of risk line).	<b>Most Preferred</b> Effectively minimizes risk to public safety (trail outside of risk line).	<b>Most Preferred</b> Effectively minimizes risk to public safety (trail outside of risk line).
	Improve Emergency Services access to the waterfront	<ul style="list-style-type: none"> <li>Ability to provide additional Emergency Services access along the waterfront</li> </ul>	<b>Least Preferred</b> Provides no access beyond east parking lot at Bluffer's Park.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.
<b>Objective-Level Ranking</b>			<b>Least Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>

### 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;
- 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 the entrance to the Bluffer's Park boat basin.

Considering the above three 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*).

### Objective 4: Consistency and Coordination with Other Initiatives

The criteria and indicators for this objective measure the extent to which the Alternatives are consistent and coordinated with other initiatives or plans in the Study Area. For this objective, only one criterion was considered as all the others were screened as there were no differences between the Alternatives:

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

**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**.

**Table 5-5** West Segment, Objective #3 Criteria Level Evaluation Summary.

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1 (Headland Beach)	Alternative 2A (Short Span Bridge)	Alternative 2B (Long Span Bridge)	Alternative 3A (Short Span Island-Bridge)	Alternative 3B (Long Span Island-Bridge)	Alternative 4 (Causeway)	Alternative 5A (Narrow Beach + Bridge)	Alternative 5B (Wide Beach)
<b>Provide an Enjoyable Waterfront Experience</b>	Improve public access to the waterfront	<ul style="list-style-type: none"> <li>• Potential to provide continuous formal public access along the shoreline</li> <li>• Ability to accommodate a primary to high-capacity multi-use trail (width)</li> <li>• Ability to meet AODA grade standard</li> <li>• Ability to provide formal direct public access to the water</li> </ul>	<b>Least Preferred</b> 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).	<b>Most Preferred</b> 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%.	<b>Preferred</b> 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.	<b>Preferred</b> 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.	<b>Preferred</b> 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.	<b>Preferred</b> 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.	<b>Intermediate Preferred</b> 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.	<b>Most Preferred</b> 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%.	<b>Most Preferred</b> 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"> <li>• Potential for change in character of sand shorelines</li> <li>• Potential impacts to the Blue Flag Beach at Bluffer's Park.</li> <li>• Potential for impact on navigation and boating infrastructure</li> </ul>	<b>Preferred</b> No negative impact to character of existing sand beach or changes to existing conditions. Gradual reduction in sediment supply.	<b>Preferred</b> 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.	<b>Intermediate Preferred</b> 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.	<b>Intermediate Preferred</b> 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.	<b>Intermediate Preferred</b> 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.	<b>Intermediate Preferred</b> 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.	<b>Intermediate Preferred</b> 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.	<b>Most Preferred</b> 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.	<b>Most Preferred</b> 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.
<b>Objective-Level Ranking</b>			<b>Intermediate Preferred</b>	<b>Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>

**Table 5-6** West Segment, Objective #4 Criteria Level Evaluation Summary.

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1 (Headland Beach)	Alternative 2A (Short Span Bridge)	Alternative 2B (Long Span Bridge)	Alternative 3A (Short Span Island-Bridge)	Alternative 3B (Long Span Island-Bridge)	Alternative 4 (Causeway)	Alternative 5A (Narrow Beach + Bridge)	Alternative 5B (Wide Beach)
<b>Consistency and Coordination with Other Initiatives</b>	Ability to integrate with City and other agency plans and initiatives.	<ul style="list-style-type: none"> <li>Consistency with the goals of the Fish Community Objectives for Lake Ontario</li> </ul>	<b>Least Preferred</b> Does not provide additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> Provides additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> Provides additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> Provides additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> Provides additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> Provides additional contributions to the advancement of applicable fish community objectives.	<b>Least Preferred</b> Does not provide additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> Provides additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> Provides additional contributions to the advancement of applicable fish community objectives.
<b>Objective-Level Ranking</b>			<b>Least Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Least Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>

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.

### **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 5-7** West Segment, Objective #5 Criteria Level Evaluation Summary.

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1 (Headland Beach)	Alternative 2A (Short Span Bridge)	Alternative 2B (Long Span Bridge)	Alternative 3A (Short Span Island-Bridge)	Alternative 3B (Long Span Island-Bridge)	Alternative 4 (Causeway)	Alternative 5A (Narrow Beach + Bridge)	Alternative 5B (Wide Beach)
Achieve Value for Cost	Estimated capital cost	<ul style="list-style-type: none"> <li>Estimated cost to construct (relative to each other)</li> <li>Potential amount of waterlot and property acquisition required (relative to each other)</li> </ul>	<b>Most Preferred</b> No construction costs. No Crown lot acquisition.	<b>Preferred</b> Estimated to have higher cost than the “Do Nothing” but lower than Alternatives 2A, 2B, 3B, 5A and 5B. Moderate Crown lot acquisition required.	<b>Preferred</b> Estimated to have intermediate-high cost. Lower than Alternatives 2B, 5A and 5B. Low Crown lot acquisition required.	<b>Intermediate Preferred</b> Estimated to have the highest relative cost. Low Crown lot acquisition required.	<b>Preferred</b> Estimated to have higher cost than the “Do Nothing” but lower than Alternatives 2A, 2B, 3B, 5A and 5B. Moderate Crown lot acquisition required.	<b>Intermediate Preferred</b> Estimated to have intermediate-high cost. Lower than Alternatives 2B, 5A and 5B. Moderate Crown lot acquisition required.	<b>Preferred</b> Estimated to have higher cost than the “Do Nothing” but lower than Alternatives 2A, 2B, 3B, 5A and 5B. Moderate Crown lot acquisition required.	<b>Least Preferred</b> Estimated to have the highest relative costs. Moderate Crown lot acquisition required.	<b>Least Preferred</b> Estimated to have the highest relative costs. Greatest amount of land acquisition required.
	Maintenance and operations costs	<ul style="list-style-type: none"> <li>Relative maintenance and operation costs of the shoreline and erosion works</li> </ul>	<b>Preferred</b> No new infrastructure provided. Low maintenance cost relative to the other Alternatives for maintenance of existing structures.	<b>Preferred</b> Low maintenance requirements.	<b>Least Preferred</b> Expected to have highest maintenance cost due to exposed nature of the bridge and need to replace components (e.g., bridge railings, deck, etc.).	<b>Least Preferred</b> Expected to have highest maintenance cost due to exposed nature of the bridge and need to replace components (e.g., bridge railings, deck, etc.).	<b>Intermediate Preferred</b> 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.	<b>Intermediate Preferred</b> 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.	<b>Preferred</b> Low maintenance requirements.	<b>Intermediate Preferred</b> While beach and new headlands maintenance requirements are relatively low, bridge component requirements are high. Combined, high relative maintenance costs.	<b>Preferred</b> Low maintenance requirements.
<b>Objective-Level Ranking</b>			<b>Most Preferred</b>	<b>Preferred</b>	<b>Intermediate Preferred</b>	<b>Least Preferred</b>	<b>Preferred</b>	<b>Intermediate Preferred</b>	<b>Preferred</b>	<b>Least Preferred</b>	<b>Intermediate Preferred</b>

## West Segment – Overall Evaluation Results

**Table 5-8** below 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 benefits achieved by this Alternative are on balance outweighed by the additional costs. Key reasons this Alternative was ranked as Most Preferred include:

- Provide 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 (Existing Conditions)	Alternative 1 Headland Beach	Alternative 2A Bridge (Short Span)	Alternative 2B Bridge (Long Span)	Alternative 3A Island Bridge (Short Span)	Alternative 3B Island Bridge (Long Span)	Alternative 4 Causeway	Alternative 5A Beach Expansion (Narrow)	Alternative 5B Beach Expansion (Wide)
Natural	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
Coordination	LP	MP	MP	MP	MP	MP	MP	MP	MP
Cost	MP	P	IP	LP	P	IP	P	LP	IP
<b>Overall</b>	<b>Least Preferred</b>	<b>Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Preferred</b>	<b>Intermediate Preferred</b>	<b>Least Preferred</b>	<b>Preferred</b>	<b>Most Preferred</b>

### 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 study objective and presents the tradeoffs 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**.

## 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;
- Potential for Impact on Terrestrial Species at Risk.

**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, the Alternative provides 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 all three criteria. Its key advantage is that it provides a greater benefit for the enhancement of aquatic and terrestrial habitat than the revetment Alternative.

## 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.

**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**.

**Table 5-9** Central Segment, Objective #1 Criteria Level Evaluation Summary.

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1 (Headland Beach)	Alternative 2 (Revetment)
<b>Protect and Enhance Terrestrial and Aquatic Natural Features and Linkages</b>	Extent of aquatic habitat enhanced or diminished	<ul style="list-style-type: none"> <li>• Ability to increase shoreline morphology by increasing shoreline irregularity</li> <li>• Ability to increase shoreline substrate type diversity</li> <li>• Potential for aquatic habitat loss or modification</li> </ul>	<b>Least Preferred</b> No fill, but no increase in morphology. No improvement in shoreline substrate type diversity.	<b>Most Preferred</b> High amount of fill (65,000 m <sup>2</sup> ). 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.	<b>Intermediate Preferred</b> High amount of fill (42,000 m <sup>2</sup> ). Virtually no change to shoreline morphology and no change to shoreline substrate type diversity.
	Extent of terrestrial habitat attributes enhanced or diminished	<ul style="list-style-type: none"> <li>• Potential to create appropriate land-water interface</li> <li>• Impact to vegetation communities of concern</li> </ul>	<b>Intermediate Preferred</b> No improvement to land water interface. No impacts to vegetation communities of concern.	<b>Most Preferred</b> Greatest positive change to land water interface through a 50% increase in shoreline length that provides an interface that is always out of water. No anticipated impacts to vegetation communities of concern.	<b>Intermediate Preferred</b> No improvement to land-water interface. No anticipated impacts to vegetation communities of concern.
<b>Objective-Level Ranking</b>			<b>Least Preferred</b>	<b>Most Preferred</b>	<b>Intermediate Preferred</b>

**Table 5-10** Central Segment, Objective #2 Criteria Level Evaluation Summary.

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

Regarding the criterion *Ability to Minimize Public Safety Risk and Property Loss as a Result of Slope Erosion/Failure*, both Alternatives were ranked as Most Preferred as they effectively minimize risk to public safety (allow for trail development outside of the risk line) and risk to loss of property is minimal. The “Do Nothing” Alternative was ranked least preferred as there was no change to the existing risk.

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

### **Objective 3: Provide an Enjoyable Waterfront Experience**

The criteria and indicators for this objective measure the extent of each Alternative provides an enjoyable waterfront experience. For this objective, the following criteria were 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.

### **Objective 4: Consistency and Coordination with Other Initiatives**

The criteria and indicators for this objective measure the extent to which the Alternatives are consistent and coordinated 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**.

**Table 5-11** Central Segment, Objective #3 Criteria Level Evaluation Summary.

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1 (Headland Beach)	Alternative 2 (Revetment)
<b>Provide an Enjoyable Waterfront Experience</b>	Improve public access to the waterfront	<ul style="list-style-type: none"> <li>• Potential to provide continuous formal public access along the shoreline</li> <li>• Ability to accommodate a primary to high-capacity multi-use trail (width)</li> <li>• Ability to meet AODA grade standard</li> <li>• Ability to provide formal direct public access to the water</li> </ul>	<p><b>Least Preferred</b></p> <p>Does not provide for continuous public access or primary 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><b>Most Preferred</b></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><b>Preferred</b></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 1A (due to the revetment).</p>
<b>Objective-Level Ranking</b>			<b>Least Preferred</b>	<b>Most Preferred</b>	<b>Preferred</b>

**Table 5-12** Central Segment, Objective #4 Criteria Level Evaluation Summary.

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

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.

#### **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 criteria *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* criteria, 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 (Existing Conditions)	Alternative 1 (Headland Beach)	Alternative 2 (Revetment)
<b>Achieve Value for Cost</b>	Estimated capital cost	<ul style="list-style-type: none"> <li>Estimated cost to construct (relative to each other)</li> <li>Potential amount of waterlot and property acquisition required (relative to each other)</li> </ul>	<b>Most Preferred</b> No construction or property acquisition costs.	<b>Least Preferred</b> Highest relative costs. Greater amount of Crown water lots than Alternative 2.	<b>Intermediate Preferred</b> Lower cost than Alternative 1. Lesser amount of Crown water lots than Alternative 1.
	Maintenance and operations costs	<ul style="list-style-type: none"> <li>Relative maintenance and operation costs of the shoreline and erosion works</li> </ul>	<b>Intermediate Preferred</b> On-going maintenance of existing concrete rubble shore will be required (existing shoreline works at Guild Parks and Gardens in need of repair).	<b>Preferred</b> Low maintenance requirements.	<b>Most Preferred</b> Least maintenance requirements.
<b>Objective-Level Ranking</b>			<b>Most Preferred</b>	<b>Intermediate Preferred</b>	<b>Preferred</b>

## Central Segment – Overall Evaluation Results

**Table 5-14** below provides a summary of the rankings by objective for the two 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*. It was determined by the Project Team that the additional benefits of Alternative 1 (Headland Beach) justify its additional costs. 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	Alternative 1 Headland Beach	Alternative 2 Revetment
Natural	LP	MP	IP
Risk	LP	MP	MP
Experience	LP	MP	P
Coordination	LP	MP	MP
Cost	MP	IP	P
<b>Overall</b>	<b>Intermediate Preferred</b>	<b>Most Preferred</b>	<b>Preferred</b>

### 5.4.4 Evaluation Results – East Segment

The following presents the comparative evaluation results for the East Segment. The evaluation is organized by study objective and presents the tradeoffs 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**.

#### **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**.

**Table 5-15** East Segment, Objective #1 Criteria Level Evaluation Summary.

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1A (Headland Beach with top of Bluffs connection)	Alternative 1B (Headland Beach with base of Bluffs connection)	Alternative 2A (Bridge & Headlands with top of Bluffs connection)	Alternative 2B (Bridge & Headlands with base of Bluffs connection)	Alternative 3A (Island-Bridge & Headlands with top of Bluffs connection)	Alternative 3B (Island-Bridge & Headlands with base of Bluffs connection)	Alternative 4A (Headland Beach with Revetment to East Point Park)	Alternative 4B (Headland Beach to East Point Park)	Alternative 5 (Top of Bluffs connection over Grey Abbey Ravine)
<b>Protect and Enhance Terrestrial and Aquatic Natural Features and Linkages</b>	Extent of aquatic habitat enhanced or diminished	<ul style="list-style-type: none"> <li>• Ability to increase shoreline morphology by increasing shoreline irregularity</li> <li>• Ability to increase shoreline substrate type diversity</li> <li>• Potential for aquatic habitat loss or modification</li> </ul>	<b>Intermediate Preferred</b> No fill, but no improvements to morphology or substrate type diversity.	<b>Intermediate Preferred</b> Medium amount of fill (48,000 m <sup>2</sup> ). 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.	<b>Intermediate Preferred</b> Highest amount of fill (94,000 m <sup>2</sup> ). 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.	<b>Intermediate Preferred</b> Low-medium amount of fill (26,000 m <sup>2</sup> ). 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.	<b>Least Preferred</b> High amount of fill (71,000 m <sup>2</sup> ). 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.	<b>Intermediate Preferred</b> Medium amount of fill (48,000 m <sup>2</sup> ). 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.	<b>Intermediate Preferred</b> Highest amount of fill (94,000 m <sup>2</sup> ). 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.	<b>Preferred</b> High amount of fill (59,000 m <sup>2</sup> ). 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.	<b>Most Preferred</b> High amount of fill (86,000 m <sup>2</sup> ). 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.	<b>Intermediate Preferred</b> No fill, but no improvements to morphology or substrate type diversity.

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1A (Headland Beach with top of Bluffs connection)	Alternative 1B (Headland Beach with base of Bluffs connection)	Alternative 2A (Bridge & Headlands with top of Bluffs connection)	Alternative 2B (Bridge & Headlands with base of Bluffs connection)	Alternative 3A (Island-Bridge & Headlands with top of Bluffs connection)	Alternative 3B (Island-Bridge & Headlands with base of Bluffs connection)	Alternative 4A (Headland Beach with Revetment to East Point Park)	Alternative 4B (Headland Beach to East Point Park)	Alternative 5 (Top of Bluffs connection over Grey Abbey Ravine)
	Extent of terrestrial habitat attributes enhanced or diminished	<ul style="list-style-type: none"> <li>Potential to create appropriate land-water interface</li> <li>Impact to vegetation communities of concern</li> </ul>	<p><b>Intermediate Preferred</b></p> <p>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).</p>	<p><b>Intermediate Preferred</b></p> <p>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<sup>2</sup> of vegetation communities of concern. However, there is potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.</p>	<p><b>Least Preferred</b></p> <p>Overall loss to land water interface through a reduction in shoreline length that provides an 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<sup>2</sup> of vegetation communities of concern. However, there is potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.</p>	<p><b>Intermediate Preferred</b></p> <p>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<sup>2</sup> of vegetation communities of concern. However, there is potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.</p>	<p><b>Least Preferred</b></p> <p>Overall loss to land water interface through a reduction in shoreline length that provides an 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<sup>2</sup> of vegetation communities of concern. However, there is potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.</p>	<p><b>Intermediate Preferred</b></p> <p>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<sup>2</sup> of vegetation communities of concern. However, there is potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.</p>	<p><b>Least Preferred</b></p> <p>Overall loss to land water interface through a reduction in shoreline length that provides an interface that is sometimes out of water by ~60%. Addition of land water interface that is always out of water is equivalent to 3A. High degree of impact to ~18,800 m<sup>2</sup> of vegetation communities of concern. However, there is potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.</p>	<p><b>Intermediate Preferred</b></p> <p>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<sup>2</sup> 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.</p>	<p><b>Preferred</b></p> <p>Greatest gain to land water interface with the addition of approximately 1,400 m of shoreline that provides an 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<sup>2</sup> 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.</p>	<p><b>Least Preferred</b></p> <p>No improvement to land water interface. Bridge construction would require vegetation clearing on both sides of Grey Abbey Ravine, and potentially down within the ravine. Significant impacts to three bluff vegetation communities of concern (BLO1, BLS1-A and BLT1-B) are anticipated. However, there is the potential to reduce impacts on vegetation communities of concern by redirecting public access along formal trails.</p>

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1A (Headland Beach with top of Bluffs connection)	Alternative 1B (Headland Beach with base of Bluffs connection)	Alternative 2A (Bridge & Headlands with top of Bluffs connection)	Alternative 2B (Bridge & Headlands with base of Bluffs connection)	Alternative 3A (Island-Bridge & Headlands with top of Bluffs connection)	Alternative 3B (Island-Bridge & Headlands with base of Bluffs connection)	Alternative 4A (Headland Beach with Revetment to East Point Park)	Alternative 4B (Headland Beach to East Point Park)	Alternative 5 (Top of Bluffs connection over Grey Abbey Ravine)
Potential for impact on terrestrial Species at Risk	• Potential effects to habitat for Bank Swallow	<p><b>Most Preferred</b></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><b>Most Preferred</b></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><b>Least Preferred</b></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><b>Most Preferred</b></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><b>Least Preferred</b></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><b>Most Preferred</b></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><b>Least Preferred</b></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><b>Most Preferred</b></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><b>Most Preferred</b></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><b>Most Preferred</b></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>	
<b>Objective-Level Ranking</b>			<b>Intermediate Preferred</b>	<b>Preferred</b>	<b>Least Preferred</b>	<b>Intermediate Preferred</b>	<b>Least Preferred</b>	<b>Intermediate Preferred</b>	<b>Least Preferred</b>	<b>Preferred</b>	<b>Most Preferred</b>	<b>Intermediate Preferred</b>

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 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. 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 Most 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 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 bluff 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.

## 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 (provides for a public trail outside of hazard line) but 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 access along the waterfront either through trail improvements along the shore or along the tablelands.

Considering the above criteria ranking, 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 (provide for a trail outside of 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.

## Objective 3: Provide an Enjoyable Waterfront Experience

The criteria and indicators for this objective measure the extent of each Alternative provides an enjoyable waterfront experience. For this objective, the following criteria were considered:

- Improve Public Access to the Waterfront;
- 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**.

**Table 5-16** East Segment, Objective #2 Criteria Level Evaluation Summary.

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1A (Headland Beach with top of Bluffs connection)	Alternative 1B (Headland Beach with base of Bluffs connection)	Alternative 2A (Bridge & Headlands with top of Bluffs connection)	Alternative 2B (Bridge & Headlands with base of Bluffs connection)	Alternative 3A (Island-Bridge & Headlands with top of Bluffs connection)	Alternative 3B (Island-Bridge & Headlands with base of Bluffs connection)	Alternative 4A (Headland Beach with Revetment to East Point Park)	Alternative 4B (Headland Beach to East Point Park)	Alternative 5 (Top of Bluffs connection over Grey Abbey Ravine)
<b>Manage Public Safety and Property Risk</b>	Ability to minimize public safety risk and property loss as a result of slope erosion/failure	<ul style="list-style-type: none"> <li>Ability to provide a trail lakeward of risk line along the shoreline and shoreward of the risk line along the top of the bluff</li> <li>Ability to address the potential loss of public property and infrastructure as a result of slope erosion/failure (slope crest migration)</li> </ul>	<b>Least Preferred</b> 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).	<b>Preferred</b> 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.	<b>Most Preferred</b> 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.	<b>Preferred</b> 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.	<b>Most Preferred</b> 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.	<b>Preferred</b> 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.	<b>Most Preferred</b> 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.	<b>Most Preferred</b> 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.	<b>Most Preferred</b> 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.	<b>Intermediate Preferred</b> 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"> <li>Ability to provide additional Emergency Services access along the waterfront</li> </ul>	<b>Least Preferred</b> Allows for only limited access for some vehicles.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.	<b>Most Preferred</b> Provides access along entire length of Segment.
<b>Objective-Level Ranking</b>			<b>Least Preferred</b>	<b>Preferred</b>	<b>Most Preferred</b>	<b>Preferred</b>	<b>Most Preferred</b>	<b>Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Intermediate Preferred</b>

**Table 5-17 East Segment, Objective #3 Criteria Level Evaluation Summary.**

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1A (Headland Beach with top of Bluffs connection)	Alternative 1B (Headland Beach with base of Bluffs connection)	Alternative 2A (Bridge & Headlands with top of Bluffs connection)	Alternative 2B (Bridge & Headlands with base of Bluffs connection)	Alternative 3A (Island-Bridge & Headlands with top of Bluffs connection)	Alternative 3B (Island-Bridge & Headlands with base of Bluffs connection)	Alternative 4A (Headland Beach with Revetment to East Point Park)	Alternative 4B (Headland Beach to East Point Park)	Alternative 5 (Top of Bluffs connection over Grey Abbey Ravine)
<b>Provide an Enjoyable Waterfront Experience</b>	Improve public access to the waterfront	<ul style="list-style-type: none"> <li>Potential to provide continuous formal public access along the shoreline</li> <li>Ability to accommodate a primary to high-capacity multi-use trail (width)</li> <li>Ability to meet AODA grade standard</li> <li>Ability to provide formal direct public access to the water</li> </ul>	<b>Least Preferred</b> 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).	<b>Intermediate Preferred</b> 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.	<b>Preferred</b> 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.	<b>Intermediate Preferred</b> 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.	<b>Preferred</b> 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.	<b>Intermediate Preferred</b> 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.	<b>Preferred</b> Provides continuous access along the shoreline, accommodates the 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.	<b>Preferred</b> 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 shoreline (approximately half that provided by 4B); however, informal access is reduced by 50% due to revetment, but previously inaccessible areas are now accessible.	<b>Most Preferred</b> 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 is provided (approximately 1400 m); previously inaccessible areas are now accessible.	<b>Preferred</b> Provides continuous access along the shoreline, accommodates the primary to high-capacity multi-use trail width, and meets AODA grade requirements and 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"> <li>Potential for change in character of sand shorelines</li> </ul>	<b>Preferred</b> No change to existing sandy shoreline, of which 50% is currently inaccessible and 15% has been previously modified. No enhanced beach area.	<b>Preferred</b> 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.	<b>Least Preferred</b> 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.	<b>Preferred</b> 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.	<b>Least Preferred</b> 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.	<b>Preferred</b> 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.	<b>Least Preferred</b> 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.	<b>Intermediate Preferred</b> 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.	<b>Intermediate Preferred</b> 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).	<b>Preferred</b> No change to existing sandy shoreline, of which 50% is currently inaccessible and 15% has been previously modified. No enhanced beach area.
<b>Objective-Level Ranking</b>			<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Preferred</b>	<b>Preferred</b>

For the criterion *Improve Public Access to the Waterfront*, Alternative 4B 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 beach.

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 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. It is noted that as population increases more people will be drawn to the area to recreate and the experience this shoreline provides today will change as use of the area increases. It is felt 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 and 5. Key advantages of Alternative 4B is that it provides opportunity to improve public access along the shoreline including a primary to high-capacity multi-use trail and have less impact to the existing sandy shoreline (do not impact East Point Park) as much as some of the other Alternatives.

#### **Objective 4: Consistency and Coordination with Other Initiatives**

The criteria and indicators for this objective measure the extent to which each Alternative is consistent and coordinated 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 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 rail corridor expansion;
- Provide additional contributions to the advancement of applicable fish community objectives.

Regarding the criterion *Compatibility with Existing Land Use*, 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.

And 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 and Revetment to East Point Park) and 4B (Headland Beach to East Point Park) as they were ranked Most Preferred for all criteria.

#### **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**.

**Table 5-18** East Segment, Objective #4 Criteria Level Evaluation Summary.

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1A (Headland Beach with top of Bluffs connection)	Alternative 1B (Headland Beach with base of Bluffs connection)	Alternative 2A (Bridge & Headlands with top of Bluffs connection)	Alternative 2B (Bridge & Headlands with base of Bluffs connection)	Alternative 3A (Island-Bridge & Headlands with top of Bluffs connection)	Alternative 3B (Island-Bridge & Headlands with base of Bluffs connection)	Alternative 4A (Headland Beach with Revetment to East Point Park)	Alternative 4B (Headland Beach to East Point Park)	Alternative 5 (Top of Bluffs connection over Grey Abbey Ravine)
<b>Consistency and Coordination with Other Initiatives</b>	Ability to integrate with City and other agency plans and initiatives	<ul style="list-style-type: none"> <li>Ability to integrate with new and proposed plans or initiatives</li> <li>Consistency with the goals of the Fish Community Objectives for Lake Ontario</li> </ul>	<b>Least Preferred</b> Planned expansion of the rail track by Metrolinx 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.	<b>Most Preferred</b> This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx rail track. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx rail track. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx rail track. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx rail track. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx rail track. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx rail track. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx rail track. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	<b>Most Preferred</b> This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx rail track. This Alternative also provides additional contributions to the advancement of applicable fish community objectives.	<b>Intermediate Preferred</b> This Alternative can be integrated with the identified plans and initiatives. The trail would be rerouted away from the Metrolinx rail track. 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"> <li>Compatibility with existing land use (industrial)</li> <li>Compatibility with existing land use (residential)</li> </ul>	<b>Least Preferred</b> Existing trail closest to industrial and residential properties.	<b>Preferred</b> Section of new trail alignment runs directly in the back of industrial properties but trail relocated to open space. Limited private property acquisition.	<b>Most Preferred</b> 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.	<b>Preferred</b> Section of new trail alignment runs directly in the back of industrial properties but trail relocated to open space. Limited private property acquisition.	<b>Most Preferred</b> 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.	<b>Preferred</b> Section of new trail alignment runs directly in the back of industrial properties but trail relocated to open space. Limited private property acquisition.	<b>Most Preferred</b> 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.	<b>Most Preferred</b> 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.	<b>Most Preferred</b> 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.	<b>Intermediate Preferred</b> Existing trail closest to industrial and residential properties.

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1A (Headland Beach with top of Bluffs connection)	Alternative 1B (Headland Beach with base of Bluffs connection)	Alternative 2A (Bridge & Headlands with top of Bluffs connection)	Alternative 2B (Bridge & Headlands with base of Bluffs connection)	Alternative 3A (Island-Bridge & Headlands with top of Bluffs connection)	Alternative 3B (Island-Bridge & Headlands with base of Bluffs connection)	Alternative 4A (Headland Beach with Revetment to East Point Park)	Alternative 4B (Headland Beach to East Point Park)	Alternative 5 (Top of Bluffs connection over Grey Abbey Ravine)
	Potential impact on archaeological resources, built heritage resources, and cultural heritage landscapes	<ul style="list-style-type: none"> <li>Potential to impact known or potential archaeological sites</li> </ul>	<b>Most Preferred</b> No impact to any known or potential archaeological resources.	<b>Most Preferred</b> No impact to any known archaeological resources however there is potential to find resources on the tablelands.	<b>Preferred</b> 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.	<b>Most Preferred</b> No impact to any known archaeological resources however there is potential to find resources on the tablelands.	<b>Preferred</b> 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.	<b>Most Preferred</b> No impact to any known archaeological resources however there is potential to find resources on the tablelands.	<b>Preferred</b> 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.	<b>Most Preferred</b> No impact to any known archaeological resources however there is potential to find resources on the tablelands.	<b>Most Preferred</b> No impact to any known archaeological resources however there is potential to find resources on the tablelands.	<b>Most Preferred</b> No impact to any known archaeological resources however there is potential to find resources on the tablelands.
<b>Objective-Level Ranking</b>			<b>Least Preferred</b>	<b>Preferred</b>	<b>Preferred</b>	<b>Preferred</b>	<b>Preferred</b>	<b>Preferred</b>	<b>Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Intermediate Preferred</b>

**Table 5-19 East Segment, Objective #5 Criteria Level Evaluation Summary.**

Objective	Criteria	Indicators*	Do Nothing (Existing Conditions)	Alternative 1A (Headland Beach with top of Bluffs connection)	Alternative 1B (Headland Beach with base of Bluffs connection)	Alternative 2A (Bridge & Headlands with top of Bluffs connection)	Alternative 2B (Bridge & Headlands with base of Bluffs connection)	Alternative 3A (Island-Bridge & Headlands with top of Bluffs connection)	Alternative 3B (Island-Bridge & Headlands with base of Bluffs connection)	Alternative 4A (Headland Beach with Revetment to East Point Park)	Alternative 4B (Headland Beach to East Point Park)	Alternative 5 (Top of Bluffs connection over Grey Abbey Ravine)
Achieve Value for Cost	Estimated capital cost	<ul style="list-style-type: none"> <li>Estimated cost to construct (relative to each other)</li> <li>Potential amount of waterlot and property acquisition required (relative to each other)</li> </ul>	<b>Most Preferred</b> No new infrastructure. Least Cost. Lowest amount of private and Crown waterlot acquisition.	<b>Intermediate Preferred</b> 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 waterlot and private property acquisition.	<b>Intermediate Preferred</b> Higher cost relative to Alternatives 1A, 2A, 2B, 4B and 5, but lower than Alternatives 3A, 3B and 4A. Moderate amount of Crown waterlot and private property acquisition.	<b>Intermediate Preferred</b> 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 waterlot and private property acquisition.	<b>Intermediate Preferred</b> Higher cost relative to Alternatives 2A, 4B and 5, but lower than Alternatives 1A, 1B, 3A, 3B, and 4A. Moderate amount of Crown waterlot and private property acquisition.	<b>Intermediate Preferred</b> Highest cost relative to other alternatives. Potential for higher cost due to geotechnical requirements of the staircase. Moderate amount of Crown waterlot and private property acquisition.	<b>Intermediate Preferred</b> Higher cost relative to Alternatives 1A, 1B, 2A, 2B, 4B, and 5 but lower than Alternative 3A. Moderate amount of Crown waterlot and private property acquisition.	<b>Intermediate Preferred</b> Higher cost relative to Alternatives 1A, 1B, 2A, 2B, 4B and 5 but lower than Alternative 3A. Moderate amount of Crown waterlot and private property acquisition.	<b>Intermediate Preferred</b> Higher cost than Alternative 5 but lower than Alternatives 1A, 1B, 2B, 3A, 3B, and 4A. Moderate amount of Crown waterlot and private property acquisition.	<b>Preferred</b> Low relative cost as no shoreline works. Grey Abbey bridge construction is most significant cost. Low amount of Crown waterlot and private property acquisition.
	Maintenance and operations costs	<ul style="list-style-type: none"> <li>Relative maintenance and operation costs of the shoreline and erosion works</li> </ul>	<b>Most Preferred</b> Maintenance of existing works required, but most are private. Erosion works will be required in the future below Grey Abbey Park.	<b>Preferred</b> Low maintenance requirements.	<b>Preferred</b> Low maintenance requirements.	<b>Intermediate Preferred</b> 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.	<b>Least Preferred</b> 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.	<b>Least Preferred</b> 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.	<b>Least Preferred</b> 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.	<b>Preferred</b> Low maintenance requirements.	<b>Preferred</b> Low maintenance requirements.	<b>Most Preferred</b> Maintenance of existing works required, but most are private. Erosion works will be required in the future below Grey Abbey Park.
<b>Objective-Level Ranking</b>			<b>Most Preferred</b>	<b>Preferred</b>	<b>Preferred</b>	<b>Intermediate Preferred</b>	<b>Least Preferred</b>	<b>Least Preferred</b>	<b>Least Preferred</b>	<b>Preferred</b>	<b>Preferred</b>	<b>Preferred</b>

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.

### 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 Coordination) and a ranking of Preferred for two objectives (Experience and Cost).

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

Objective	Do Nothing (Existing Conditions)	Alternative 1A (Headland Beach with top of Bluffs connection)	Alternative 1B (Headland Beach with base of Bluffs connection)	Alternative 2A (Bridge & Headlands with top of Bluffs connection)	Alternative 2B (Bridge & Headlands with base of Bluffs connection)
Natural Environment	IP	P	LP	IP	LP
Risk	LP	P	MP	P	MP
Experience	IP	IP	IP	IP	IP
Coordination	LP	P	P	P	P
Cost	MP	P	P	IP	LP
<b>Overall</b>	<b>Intermediate Preferred</b>	<b>Preferred</b>	<b>Preferred</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>
Objective	Alternative 3A (Island-Bridge & Headlands with top of Bluffs connection)	Alternative 3B (Island-Bridge & Headlands with base of Bluffs connection)	Alternative 4A (Headland Beach with Revetment to East Point Park)	Alternative 4B (Headland Beach to East Point Park)	Alternative 5 (Top of Bluffs connection over Grey Abbey Ravine)
Natural Environment	IP	LP	P	MP	IP
Risk	P	MP	MP	MP	IP
Experience	IP	IP	IP	P	P
Coordination	P	P	MP	MP	IP
Cost	LP	LP	P	P	P
<b>Overall</b>	<b>Intermediate Preferred</b>	<b>Intermediate Preferred</b>	<b>Preferred</b>	<b>Most Preferred</b>	<b>Intermediate Preferred</b>

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 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 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 Test of Alternative 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 was found for each Project Objective:

### **Naturalization 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, a distance of ~3.7 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 Ravine and east to East Point Park.

### **Safety 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.
- EMS access to the shoreline between the Guild Park and Gardens and Beechgrove Drive will not be improved.

### **Experience Objective**

- The Alternate Plan may result in the loss or displacement of the existing Waterfront Trail between Greyabbey Trail and Beechgrove Drive, as the Metrolinx rail expansion will constrain the existing on-road connection through an increasing train frequency to every seven minutes, and potentially make the resulting off-road connection 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 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.

### **Coordination 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 (32% increase over the next 25 years) or the resultant pressure of increased use on greenspace.

**Value for Money Objective**

- The cost of the Alternate Plan is 15% less than the cost of the Preferred Alternative; however, does not address the continued unmanaged access and habitat degradation at East Point Park.

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

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