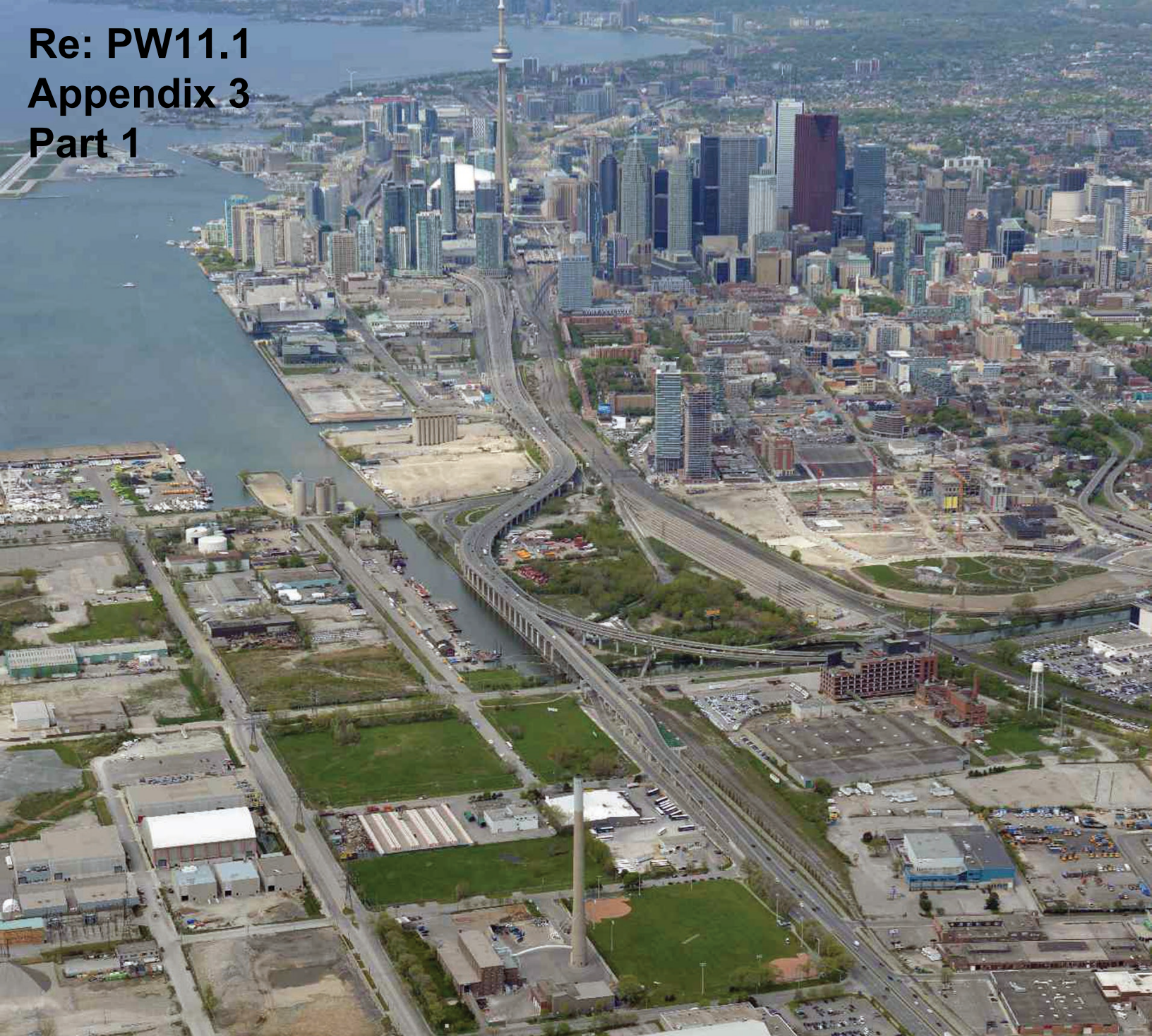


Re: PW11.1  
Appendix 3  
Part 1



Gardiner Expressway and Lake Shore Boulevard East Reconfiguration  
Environmental Assessment and Urban Design Study

# Alternative Designs Evaluation INTERIM REPORT

FEBRUARY 2016





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## 1. INTRODUCTION

Waterfront Toronto (WT) and the City of Toronto (City) are jointly undertaking an Individual Environmental Assessment (EA) to determine the future of the eastern portion of the elevated Gardiner Expressway and Lake Shore Boulevard from approximately Lower Jarvis Street to approximately Leslie Street (referred to as the Gardiner East EA). The EA is being completed pursuant to the Ontario *Environmental Assessment Act* under the Ministry of Environment and Climate Change (MOECC).

The Gardiner East EA commenced in 2009 with the preparation of the Terms of Reference (ToR) for the study. The ToR set out the study process to be followed in conducting the Individual EA, including a description of how the public, stakeholders, First Nations communities, and agencies will be informed and consulted with throughout the EA. The ToR was approved by the Minister of the Environment in December 2009.

At the June 10-12, 2015, City Council meeting, after considering the alternatives solution evaluation results as presented by the EA Project Team (Waterfront Toronto, City staff and the Dillon Consulting team), Council selected the Hybrid Alternative Solution as the preferred alternative solution to be carried forward for further study and evaluation as part of the EA alternative design step. As a result, three alternative Hybrid design concepts have been developed and evaluated. This report presents the three Hybrid design alternatives and the results of the evaluation. The evaluation considered the costs/impacts and the benefits/opportunities of the design alternatives as well as input received from various stakeholders.

## 2. GARDINER EAST IN CONTEXT

### 2.1. Study Area

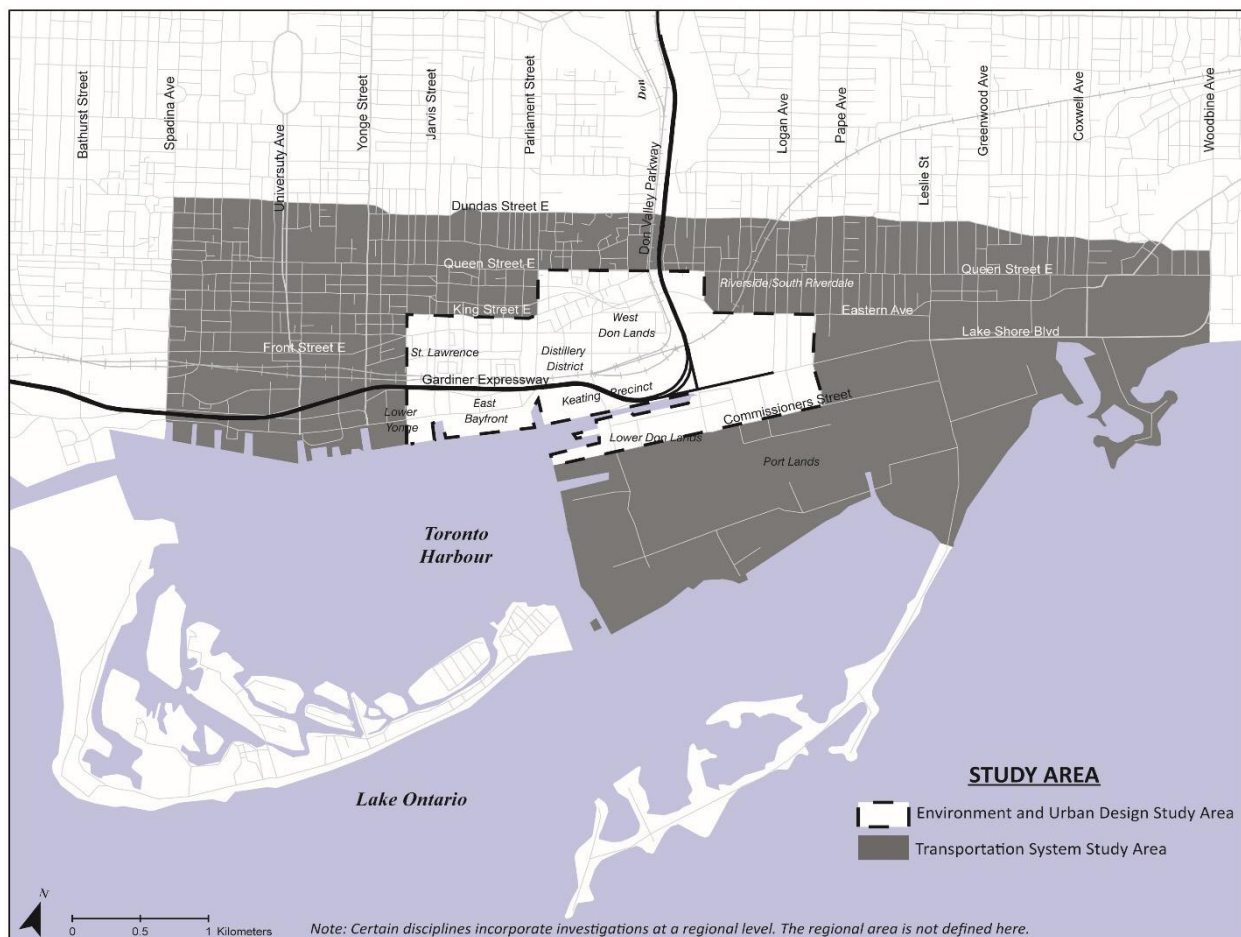
The EA study area extends from approximately Lower Jarvis Street to approximately Leslie Street. It includes lands beyond the immediate Gardiner/Lake Shore East corridor which could potentially experience disruption effects by the proposal being considered. This includes lands south of King Street to the waterfront. The study area includes five emerging waterfront neighbourhoods: Lower Yonge, East Bayfront, Keating, Port Lands and South of Eastern. North of the rail viaduct the study area also includes West Don Lands, Distillery District, Cork Town and the St. Lawrence neighbourhoods. Regional investigation of Transportation and Economics required a wider study area. The lands that extend from Dundas Street to Lake Ontario and from Spadina Avenue to Woodbine Avenue have been included in the transportation assessment work for the EA. **Figure 2.1** illustrates the study area.

The study area and surrounding zone are in transition and undergoing tremendous change. Along with the five emerging neighborhoods mentioned above, the study area also includes well-established neighborhoods that are undergoing rapid change including: St. Lawrence Neighbourhood, Distillery District, Cork Town and Riverside/South Riverdale. There are also large tracts of underdeveloped/vacant

lands in the Gardiner/Lake Shore Boulevard corridor that are planned to be developed including the First Gulf proposal for a commercial/retail development on the former Unilever Site. This proposed project is of significant size (the developer has proposed in excess of 25,000 new workers) and would serve as a major economic catalyst for the Port Lands and South of Eastern employment area and the City. First Gulf has submitted an Official Plan Amendment application to the City. This development proposal has been considered in the development and evaluation of the Hybrid design alternatives.

The City of Toronto and Waterfront Toronto are also undertaking about 15 other transportation and planning related studies in the larger area, including the Don Mouth Flood Protection and Naturalization Project in conjunction with Toronto Region Conservation Authority (TRCA). These other studies and projects have been considered in the Gardiner East EA study.

**Figure 2.1: Environment and Urban Design Study Area & Transportation System Study Area**





## 2.2. Growth and Development

Existing conditions (2013) and future conditions (2031) in the study area have been considered in the development and assessment of the alternative designs. A 2031 full build-out date has been used for this study to assess the effects of the alternatives on the full development plans for the area, whether they are achieved by 2031 or at a later date. It has been assumed that the Gardiner East EA Preferred Solution (the Project) would be constructed in the 2020-2026 period. The potential construction impacts of the alternatives have been assessed on the basis of existing (2013) conditions as well as consideration of other developments expected to be in place or under construction in the short-term in the Study Area as per City approved precinct plans.

The Hybrid design alternatives impact the form and scale of future development possible within the Keating Precinct between Cherry Street and the Don Roadway. Each Hybrid design alternative provides a different scenario for development in the Keating Precinct. This is further detailed in Chapter 5.

All other precincts in the study area (East Bayfront, Lower Yonge, West Don Lands, Port Lands and Lower Don Lands) were assumed to experience the same development scenario regardless of the Hybrid design alternative selected.

## 3. THIRD-PARTY PROPOSALS

While developing the Hybrid design concepts (see Chapter 4.0 for their description), the study team received unsolicited proposals from stakeholders and community members. Two third-party proposals were submitted to the study team during the period that the alternative designs for the Hybrid concept were being developed including: 1) The Viaduct Concept and 2) the Green Gardiner Concept. These concepts describe alternate visions for the future of the Gardiner Expressway. Both concepts explore alternative approaches to minimize (in varying degrees) the physical footprint, maintenance costs, and visual impacts associated with reconstructing an elevated expressway, while improving public access to the water's edge and maximizing opportunities for high-quality neighbourhood planning and development. These two third-party concepts were described in the Progress Report on Design Concepts for the Hybrid EA Preferred Alternative) presented at a Special Meeting of Public Works and Infrastructure Committee (PWIC) on September 22, 2015. The PWIC received this item for information, and directed staff to: "Undertake further evaluation of the third-party proposals as part of the EA study process". The work that was undertaken to evaluate these proposals is presented below in Sections 3.1.1 and 3.1.2.

While the original third-party concepts extended from Jarvis to the Don River, the concepts were revised to focus on the portion of the study area that is located west of Cherry Street following analysis and discussion. In so doing, it was envisioned that either of these concepts could be combined with the Hybrid concepts that lies to the east of Cherry Street. Both concepts enhance the area from Yonge

Street to Cherry Street and would free up sections of Lake Shore Boulevard. The work undertaken by the study team to review these third-party concepts involved the following:

- Met with the third-party concept development teams on several occasions from mid-2015 to early 2016;
- Met with other stakeholders regarding these concepts including Metrolinx;
- Provided road design, road alignment and traffic operations input resulting in the refinement of the third-party concept designs to ensure that they would adequately function and connect with other roadway infrastructure;
- Assessed the feasibility and constraints of each concept including impacts to private land;
- Determined ballpark cost estimates, land acquisition costs, and potential land value from sale of surplus City-owned lands;
- Provided a recommendation regarding the further consideration of these concepts in the EA study; and,
- Presented the results of the above to the third-party development teams, the Stakeholder Advisory Committee (SAC), and to the public at the January 19, 2016 Public Information Centre.

### **3.1. Overview of Third-Party Proposals**

#### **3.1.1. The Viaduct**

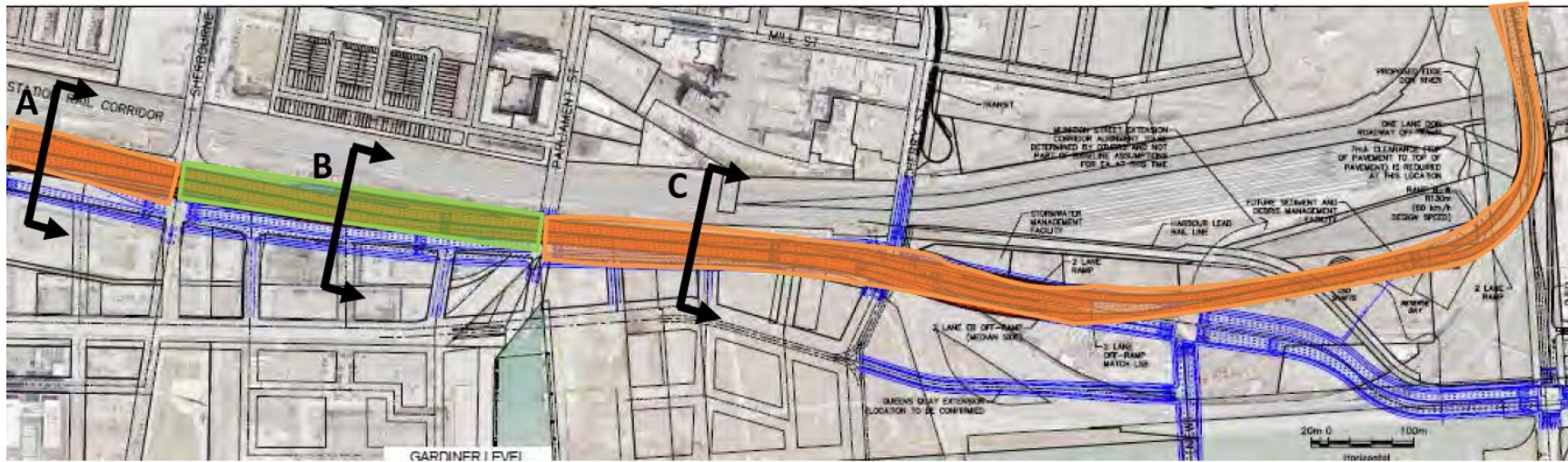
The first proposal, called "The Viaduct", was submitted by a team of consultants including Robert E. Millward, David Dennis Design, DTAH and Paul Bedford. The original proposal called for the Gardiner Expressway to be reconstructed on a new berm located south of the rail lands between Jarvis Street and Munition Street. It was proposed that the height of the expressway would be similar to the rail berm. Part of the rationale for supporting the expressway with a berm was to reduce long-term maintenance costs. A fully landscaped Lake Shore Boulevard (LSB) would run parallel to and south of the expressway. It was also originally proposed by the Viaduct team that new Gardiner–DVP ramps would be constructed to fly over the east-west Metrolinx rail corridor that would result in a Gardiner-DVP ramp at a much greater height than they are today.

After reviewing this concept further with the Gardiner study team, the Viaduct concept was revised to extend west of Cherry Street only as it would not be possible to place an expressway supported by a berm immediately south of the rail corridor all the way to the DVP because of the need:

- 1) for a DVP connection ramp at a suitable design speed (with a larger radius curve);
- 2) to avoid impacting the approved City stormwater management facility that is located immediately east of Cherry Street / south of the rail corridor and which has partially been constructed; and,
- 3) to avoid impacting the approved Don Mouth Sediment Management Facility.

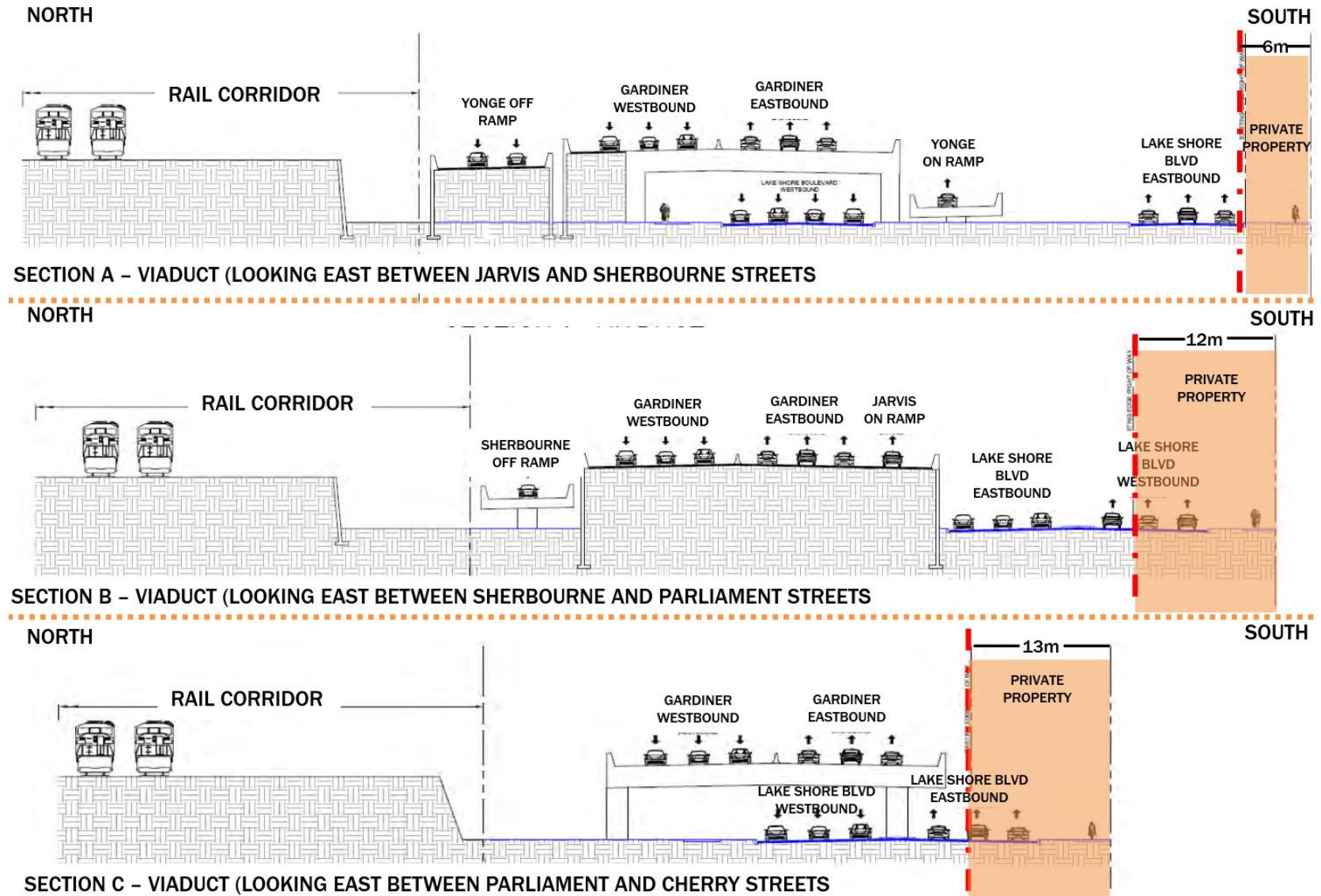
Upon further review of the concept, it was also determined that a full viaduct with LSB running south of a berm supported expressway would require significant private land as the existing right-of-way is not wide enough to accommodate a full berm/parallel LSB configuration (as the corridor ranges in width from approximately 65 m to 35 m and the full Viaduct concept with LSB running parallel to it would require about 75 m). To reduce private property requirements, the Viaduct was revised by assuming that portions of the elevated expressway would be supported by a “bridge structure” allowing sections of LSB to be placed under the elevated expressway in a “stacked” configuration either entirely or partially. Due to corridor width restrictions, the only section of the expressway that could reasonably be placed on a berm with LSB located immediately to the south, without significant property requirements, is between Parliament Street and Sherbourne Street (about a 425 meter section). **Figures 3.1 and 3.2** illustrate the Viaduct concept. Other components included in the Viaduct include westbound off-ramps at Sherbourne and Yonge Streets and an eastbound on-ramp at Jarvis Street.

Figure 3.1: The Viaduct Plan



- Viaduct
- Elevated Structure

Figure 3.2: The Viaduct Sections Drawings

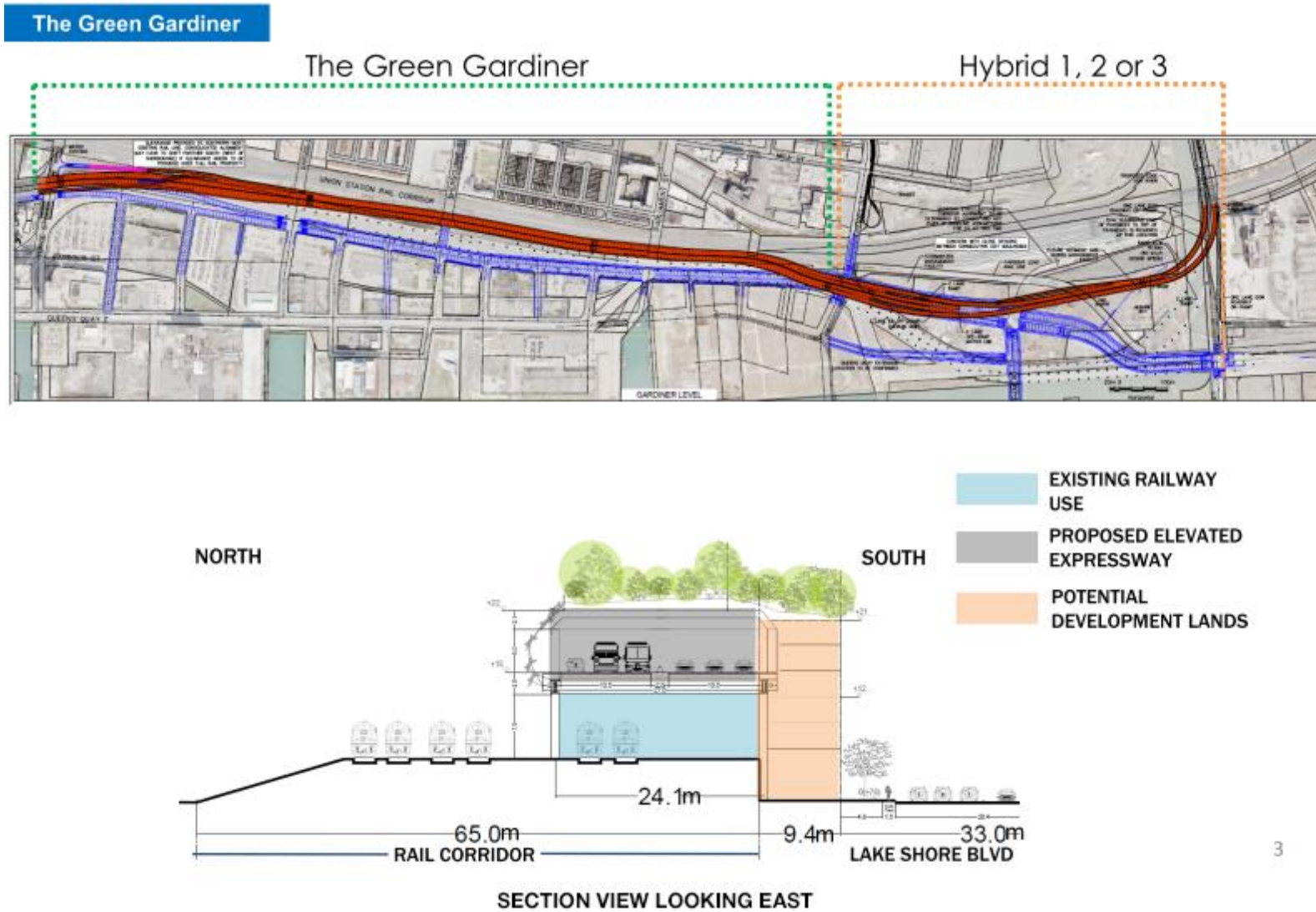


### 3.1.2. The Green Gardiner

The Green Gardiner concept was developed and submitted by a team of consultants including BrookMcIlroy, Planning Alliance (SVN) and Entuitive. The proposal calls for the consolidation of railway and road infrastructure with surplus lands in the road right-of-way being used for land development. Specifically, the Gardiner between Yonge Street and Cherry Street would be stacked above the rail corridor and incorporated into new development that would be located on surplus City-owned right-of-way located south of the rail corridor. Lake Shore Boulevard would then be free of the elevated expressway and be developed as a landscaped six-lane roadway with development on both sides of it. To allow westbound traffic access to Sherbourne and Jarvis Streets, similar to current conditions, a westbound exit ramp in the Keating Precinct was added to the concept.

A plan view and section view of the Green Gardiner Concept is presented in **Figure 3.3**. The concept also includes the possibility to include linear open/green space that would be supported on a platform sitting above the expressway lands as illustrated in the section view below. **Figure 3.4** provides a rendered plan view that shows conceptual new development lands positioned south of the rail corridor and the possibility of a linear green space that would lay overtop of the expressway deck running along the south side of the rail corridor.

Figure 3.3: Green Gardiner Plan and Section Drawing



3

**Figure 3.4: Green Gardiner Rendered Plan**





## 3.2. Third-Party Proposals Assessment

An assessment of the third-party concepts was undertaken by the Gardiner Study team. The purpose of this assessment was to determine the feasibility and value of these two concepts. As part of this assessment, ballpark costs were developed for each of the concepts. As well an independent land valuation consultant was retained to determine the value of the lands that would need to be acquired (for the Viaduct concept) and/or would be made available for development (for the Green Gardiner concept) (See **Appendix A** for the Land Valuation Report). The following presents a summary of the opportunities and challenges of each of the concepts.

### 3.2.1. Viaduct Concept Assessment

#### Opportunities

- Creates a section of bermed expressway / open-air Lake Shore Boulevard from Sherbourne Street to Parliament Street with two-sided development;
- A lower elevated expressway profile through a portion of the corridor would improve views across the corridor to the waterfront; and,
- Reduces lifecycle costs for the bermed expressway section.

#### Challenges

- Due to right-of-way width restrictions, only 425meter of viaduct (expressway supported by a berm) is possible in the 1700 meter corridor (Jarvis Street to Don River);
- Requires property acquisition (12 sites) which would be costly and result in lengthy private landowner negotiations;
- Results in throwaway Gardiner rehabilitation costs (the existing Gardiner requires major rehabilitation to commence by 2018/2019. It is expected that construction on the Viaduct concept could not commence for a number of years and would take eight years to construct. As such, full east deck rehabilitation would be required;
- Extra \$485 million (2013\$) over Hybrid costs plus an estimated \$45-\$50 million for property acquisition from 12 parcels; and,
- Lengthens pedestrian crossing distances at some north-south streets and requires pedestrians to pass under an elevated expressway that is lower than current deck height.

### 3.2.2. Green Gardiner Concept Assessment

#### Opportunities

- 1.1 km of open-air Lake Shore Boulevard with the opportunity for two-sided development;
- Additional three hectares of public land released for development at an estimated value of \$130 - \$145 million; and,

- Possibility for new open space over the expressway deck.

### **Challenges**

- Lengthy and uncertain Metrolinx approvals process – Metrolinx has indicated that they need flexibility for future expansion of rail tracks in the corridor to accommodate the planned Regional Express Rail project, and are not in a position to provide comment on the placement of columns/piers that would be needed to support an elevated expressway over the rail corridor;
- Results in throwaway Gardiner rehabilitation costs. The existing Gardiner requires major rehabilitation to commence by 2018/2019. It is expected that construction on the Green Gardiner concept could not commence for a number of years and would take 8-10 years to construct. As such, full east deck rehabilitation would be required;
- Extra \$735 million (2013\$) over Hybrid costs plus additional cost for rail corridor air rights;
- Potential for local neighbourhood noise, air quality and view impacts;
- Removal of westbound exit at Sherbourne/Jarvis increases travel time for some commuters; and,
- Required westbound off-ramp at Munition Street reduces open space and impacts Keating Precinct.

### **3.3. Third-Party Proposal Conclusions**

The Viaduct and Green Gardiner concepts were received, refined and assessed by the Gardiner EA study team. This included a review of the concepts with respect to their transportation functionality, city building benefits, costs, potential impacts, and approval and construction timelines. It is noted that the third-party teams helped inform designs for the Hybrid east of Cherry Street, particularly with respect to new expressway alignments that are closer to the rail corridor.

Regarding the Viaduct concept, due to right-of-way width restrictions within the corridor, to avoid significant private land takings, a true “bermed” viaduct is only available for about 425 meter of the 1700 m length from Jarvis Street to the Don River. The rest of the expressway would need to be supported by a bridge structure with Lake Shore Boulevard lying under or partially under the expressway as in the current condition. Given the limited benefit of this option, its high cost and approvals uncertainty as a result of the significant land requirements, this concept is not recommended for further consideration in the EA.

The Green Gardiner concept would require the approval of Metrolinx which has advised that until their long term needs for the rail corridor are determined, they cannot support placement of road-related infrastructure in the rail corridor that might impact future rail expansion plans including the Regional Express Rail (RER) program. Even if Metrolinx was in a position to support this concept at this time, it is expected that approvals, design and construction of this concept would take many years thus it would be necessary to undertake the planned east Gardiner rehabilitation program, which needs to be initiated by 2018/2019 to ensure safe travel on the Gardiner. For these

reasons this proposal is not being considered further in this EA but could be considered in the longer term by City Council once Metrolinx has confirmed their RER plans and determined their long term rail corridor needs.

## **4. DESIGN ALTERNATIVES**

### **4.1. Corridor Segments Overview**

As shown in **Figure 4.1**, the study corridor was considered in three segments including:

- 1) West of Lower Jarvis Street to Cherry Street;
- 2) Cherry Street to the Don Roadway / Don Valley Parkway (DVP); and
- 3) Don Roadway / DVP to Leslie Street.

The following presents the corridor changes that were considered within each segment. Segments 1 and 3 are presented first as no alternative designs were identified in these segments, followed by Segment 2 where the Hybrid alternatives are located within.

**Figure 4.1: Study Segments of Gardiner-Lake Shore Boulevard Corridor**



## 4.2. Segment 1 - Lower Jarvis Street to Cherry Street:

No design alternatives have been identified in this segment, as no significant roadway infrastructure changes requiring EA approval are proposed to either the Gardiner Expressway or to Lake Shore Boulevard in this segment. Streetscaping and public realm improvements are being proposed by the City for this segment including a new off-street bike path and intersection improvements to better facilitate pedestrian/cyclist crossings. While these changes are not subject to EA approval, they are described further in this EA Report (see Section 6.2).

**Figure 4.2** provides a plan view of the streetscaping and public realm changes proposed between Lower Jarvis Street and Cherry Street. These changes could be combined with all of the Hybrid design alternatives proposed for Segment 2.

## 4.3. Segment 3 - Don Roadway / DVP to Leslie Street:

The Hybrid alternative solution that was endorsed by City Council in June 2015 included the removal of the Logan Ramps that are located over and east of the Don River (See *Dillon Consulting May 2015, Alternative Solutions Evaluation Interim Report – Addendum*). Specifically the changes that are proposed east of the Don Roadway include:

- Removal of the existing Logan on/off ramps (about 750 m of EB lanes and 850 m of WB lanes);
- Rebuilding of Lake Shore Boulevard east of the Don River as a new six-lane landscaped boulevard including planted median that incorporates the future proposed Broadview extension intersection; and,
- Improvements to the existing multi-use pathway on the north edge of Lake Shore Boulevard.

No EA alternative designs were identified for this segment. Lake Shore Boulevard is to remain within the existing road right-of-way and be rebuilt as a six-lane boulevard to accommodate forecasted auto travel demands and connect with Lake Shore Boulevard at Leslie Street and at the Don River crossing. As noted above the existing multi-use pathway is to be maintained and improved to accommodate active transportation modes. While these public realm changes are not subject to EA approval, they are described further in this EA Report (see Section 6.3).

**Figure 4.3** provides a plan view of the changes proposed between the Don Roadway and Leslie Street. These changes could be combined with all of the Hybrid design alternatives proposed for Segment 2.

**Figure 4.2: Public Realm Improvements – Segment 1: Lower Jarvis Street to Cherry Street**



**Figure 4.3: Public Realm Improvements – Segment 3: Don Roadway to Leslie Street**



#### 4.4. Segment 2 - Cherry Street to the Don Roadway

In this segment (Keating Precinct) design alternatives have been developed and were considered in this EA. With the removal of the eastern end of the Gardiner, east of the Don Roadway, the opportunity arises to rebuild the expressway connection between the Don Valley Parkway and the Gardiner. This also presents the opportunity to rethink the location and alignment of new ramps to connect Lake Shore Boulevard to and from the Gardiner, west of the Don Roadway. The opportunities for these changes occur within the Keating Precinct between Cherry Street and the Don Roadway and three Hybrid design alternatives were developed and considered for this segment. It is noted that an initial long list of Hybrid design alternatives were developed and presented in the City Staff Report - *Progress Report on Design Concepts for the Hybrid EA Preferred Alternative* that was presented to City Public Works and Infrastructure Committee on September 22, 2015.

During the drafting of different designs and alignments for a Gardiner/DVP ramp connection, several key design considerations emerged that informed the design possibilities:

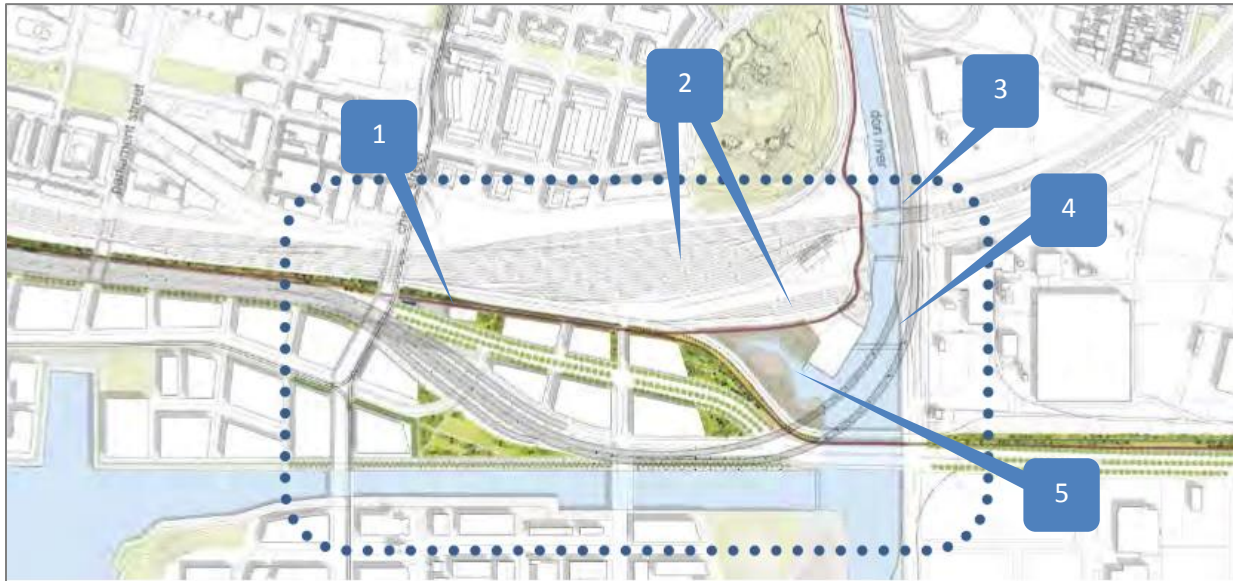
- 1) the presence of the City's stormwater management facility on the east side of Cherry Street which limits the ability to develop a new ramp alignment directly south of the rail lands/berm;
- 2) the Don and Wilson Rail Yards which support commuter and freight rail services;
- 3) the presence of the existing rail corridor and the rail bridge over the Don River and DVP which can restrict the starting point of DVP-Gardiner ramps;
- 4) the need for a minimum safe design speed for the ramp to connect the DVP and the Gardiner. The current design speed for the existing ramp is 70km/hour; and,
- 5) the need to minimize effects to the planned Don Mouth Naturalization Project sediment management facility.

**Figure 4.4** highlights the location of these key considerations influencing the design possibilities. The Hybrid design alternatives were prepared with these considerations in mind.

The three Hybrid design alternatives that were developed and evaluated in Segment 2 (Keating Precinct) are outlined below. It is important to note that the scope of the Gardiner East EA is focused on the Gardiner Expressway and Lake Shore Boulevard. **The scope of the EA does not include other surface street improvements including for example: Queens Quay extension, Munition Street bridge and extension, realigned Cherry Street, and Broadview Avenue extension.** While these other potential improvements are shown on the design figures and have been assumed to be in place in the assessment of project effects in this EA study, these local road improvements already have approvals in place (e.g., Cherry Street realignment) or are being studied (e.g., Broadview Avenue Extension) or will be studied under future EAs as well as through a future planned review and update of the Keating Precinct Plan that is to be undertaken by the City and Waterfront Toronto following Gardiner East EA approval by the MOECC.



**Figure 4.4: Key Infrastructure Considerations Influencing Design Alternatives**



#### **Hybrid Design Alternative 1**

- Remove Logan ramps that fly over and to the east of the Don River;
- Maintain the existing Gardiner Expressway through the Keating Precinct along the north edge of the Keating Channel;
- Construct new two-lane westbound on and eastbound off Lake Shore Boulevard-Gardiner ramp connections east of Cherry Street;
- Construct new approach roads to provide connection to the new on/off Gardiner ramps that run under or beside the elevated Gardiner along the north side of the Keating Channel; and,
- Construct a new Lake Shore Boulevard alignment that runs mid-block through the Keating Precinct.

#### **Hybrid Design Alternative 2**

- Remove Logan ramps that fly over and extend to the east of the Don River;
- Remove the existing DVP-Gardiner connection and rebuild it to run through the Keating Precinct further north (than Hybrid 1), away from the Keating Channel edge, constructing new “tighter” (130 m radius) ramp connections to the Don Valley Parkway;
- Construct new westbound on and eastbound off (both 2 lanes) Lake Shore Boulevard-Gardiner ramp connections east of Cherry Street that would connect with a planned Munion Street extension; and,
- Construct a new Lake Shore Boulevard alignment that runs mid-block through the Keating Precinct.

### Hybrid Design Alternative 3

- Remove Logan ramps that fly over and extend to the east of the Don River;
- Remove the existing DVP-Gardiner connection and rebuild it to run through the Keating Precinct further north (than Hybrid 2) closer to the rail corridor, and construct a new “tighter” (130 m radius) ramp connection to the Don Valley Parkway;
- Widen Metrolinx Don River/DVP Rail Bridge underpass to the east to allow for a more northern DVP-Gardiner ramp location;
- Construct new two-lane Lake Shore Boulevard-Gardiner ramp westbound on and eastbound off connections east of Cherry Street; and,
- Construct a new Lake Shore Boulevard alignment that runs mid-block through the Keating Precinct.

In addition to the Gardiner alignment and the new ramp connections to the Don Valley Parkway, each of the Hybrid design alternatives will include the extension of a multi-use pathway along the north side of Lake Shore Boulevard.

**Figures 4.5** through **4.7** present the three Hybrid design alternatives in the Keating Precinct, between Cherry Street and the Don Roadway / DVP. **Figure 4.5** provides a plan view of the Hybrid design alternative 1, **Figure 4.6** provides a plan view of the Hybrid design alternative 2, and **Figure 4.7** provides a plan view of the Hybrid design alternative 3.

**Figure 4.8** presents a comparison of the three Hybrid alignments and **Figure 4.9** presents renderings of the Hybrids showing their alignments over the Don River with full build out of the Keating Precinct.

### Lake Shore Boulevard Alignments

The proposed mid-Keating Precinct alignment for Lake Shore Boulevard that is associated with each of the Hybrid alternatives is consistent with the alignment that is proposed under the City approved Keating Precinct Plan. As part of this EA study, an alternative alignment for Lake Shore Boulevard was explored that involved a “straightened” alignment through the Precinct that would also involve a more northern crossing of the Don River. This alignment was considered to have some urban design benefits. However, it was determined that this alternate alignment would need to pass through a portion of the planned Don River Sediment Management facility. This alternate LSB alignment was reviewed with the TRCA and they indicated the sediment management facility would require significant redesign with this alignment and were uncertain if it could be accommodated. Further, with the straightened LSB alignment, the LSB/Don Roadway intersection would require a skewed intersection design which is not ideal. As a result, this alternative LSB alignment was not explored further in the EA study.

Figure 4.5: Hybrid Design Concept 1 (South) – Keating Precinct

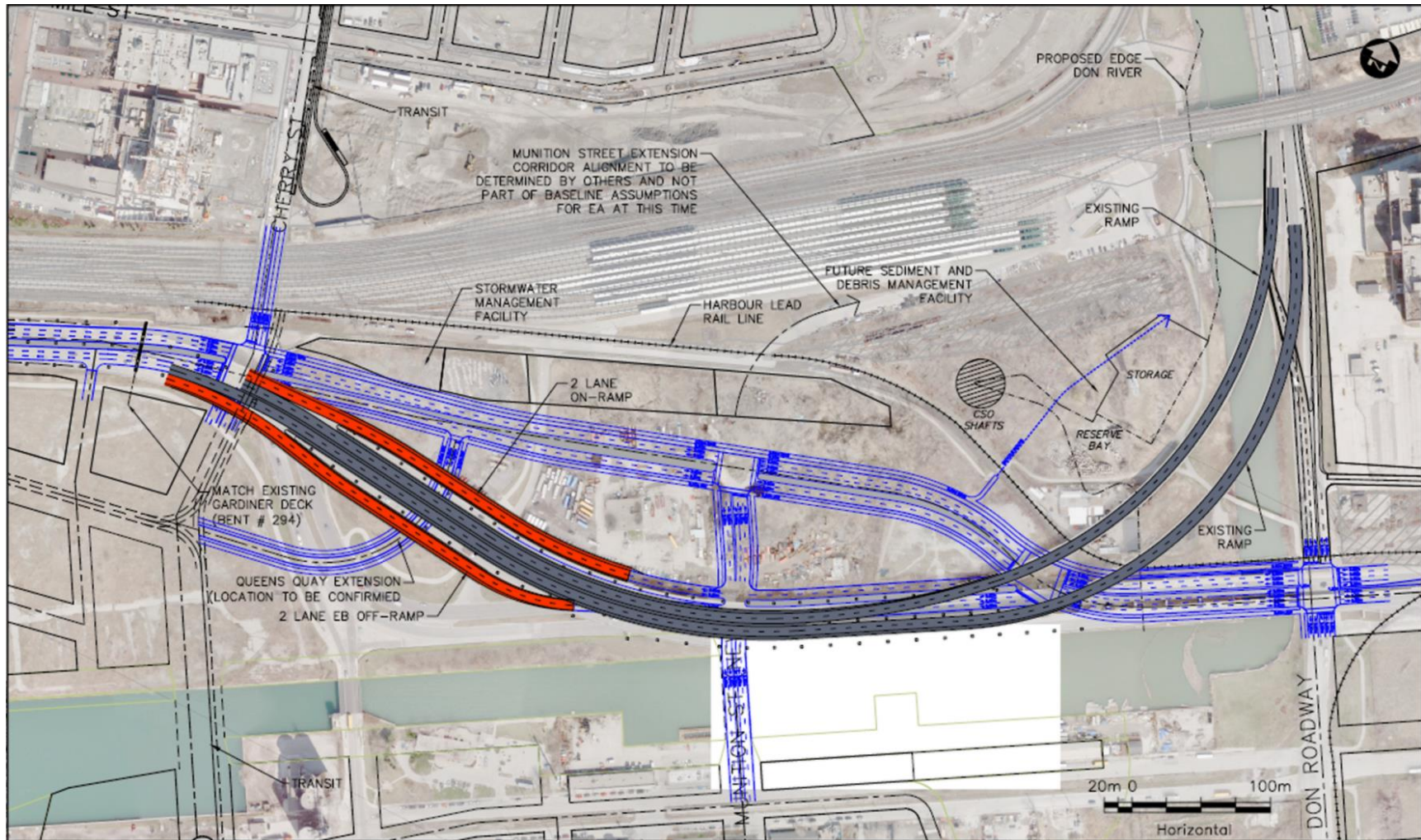


Figure 4.6: Hybrid Design Concept 2 (Mid) – Keating Precinct

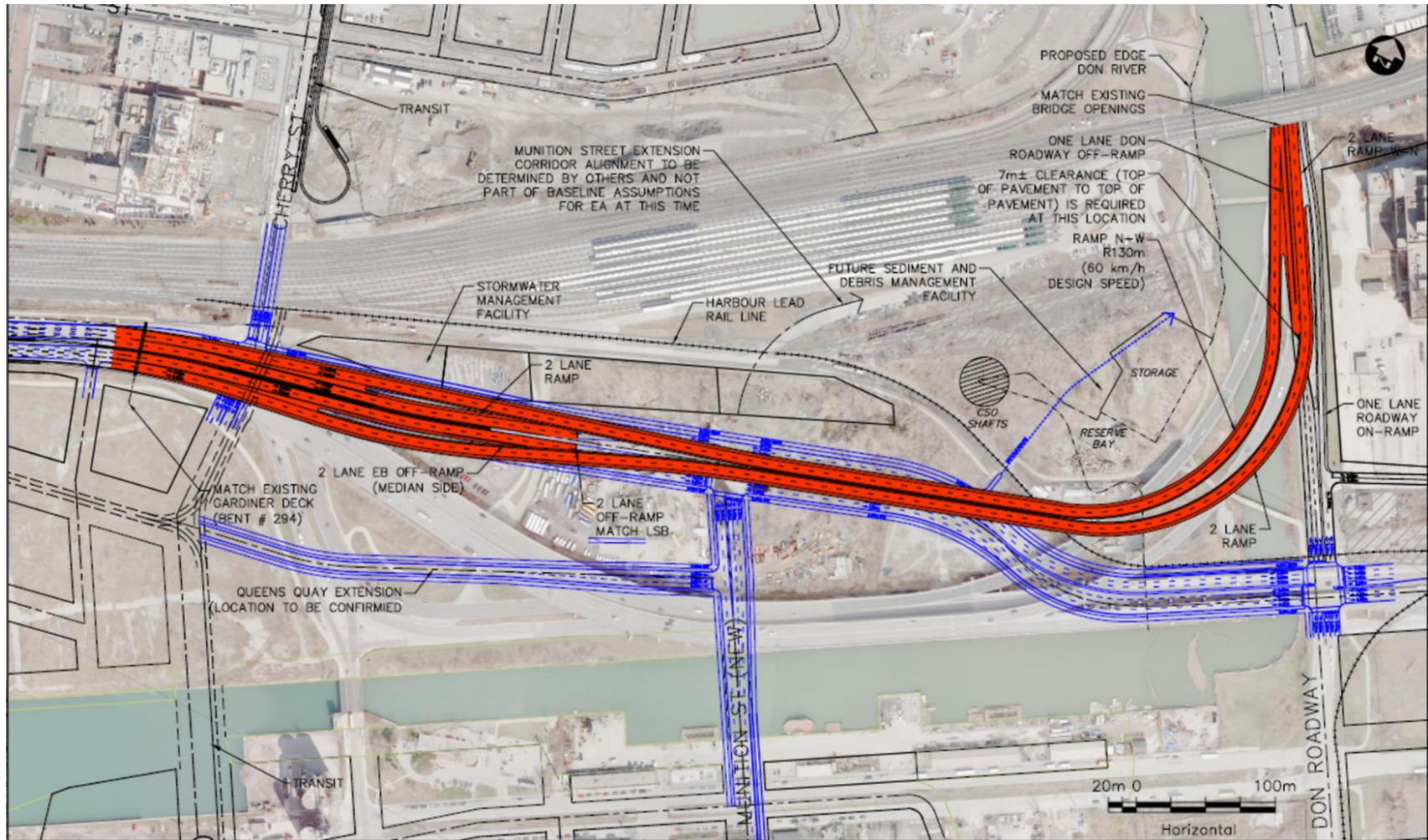


Figure 4.7: Hybrid Design Concept 3 (North) – Keating Precinct

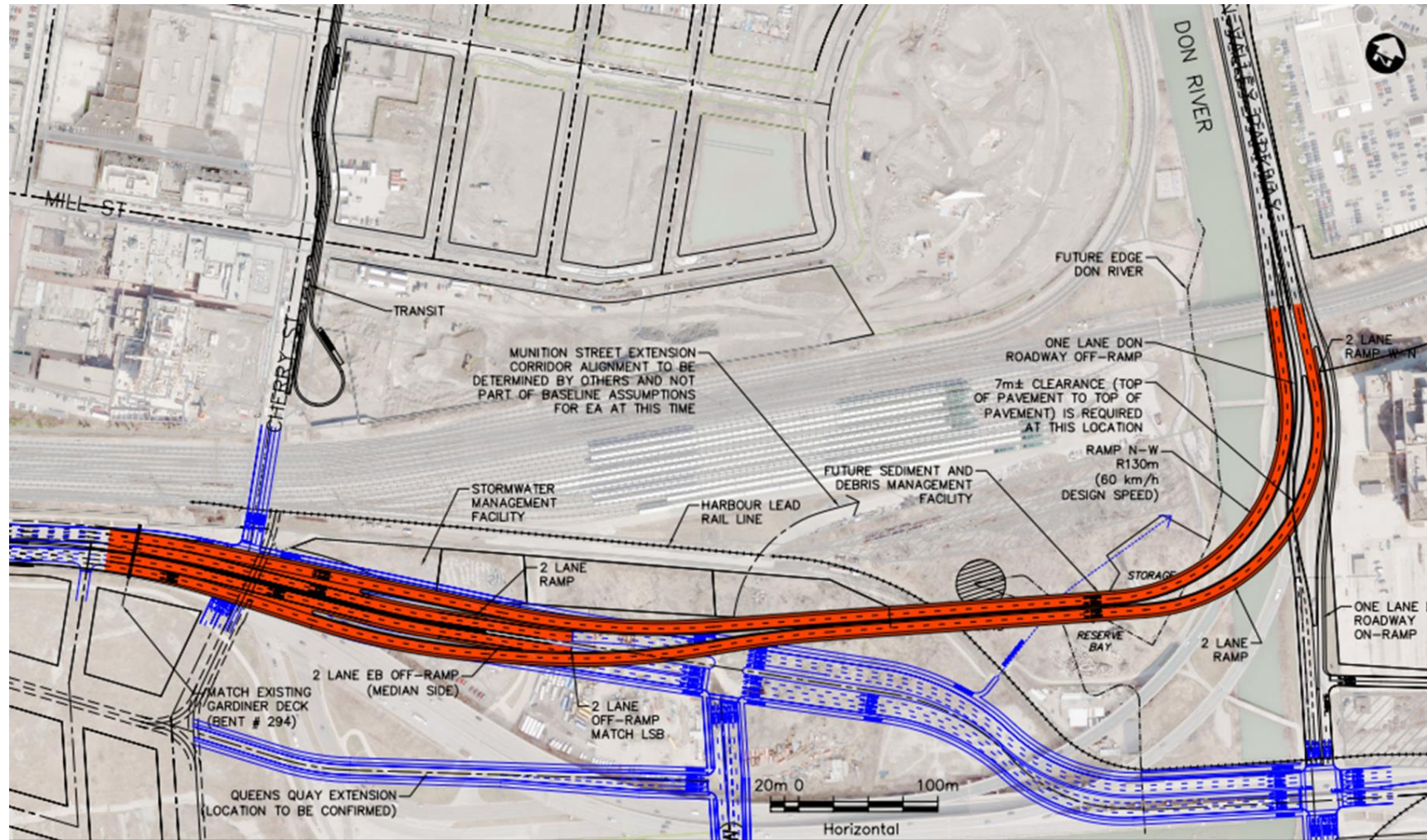
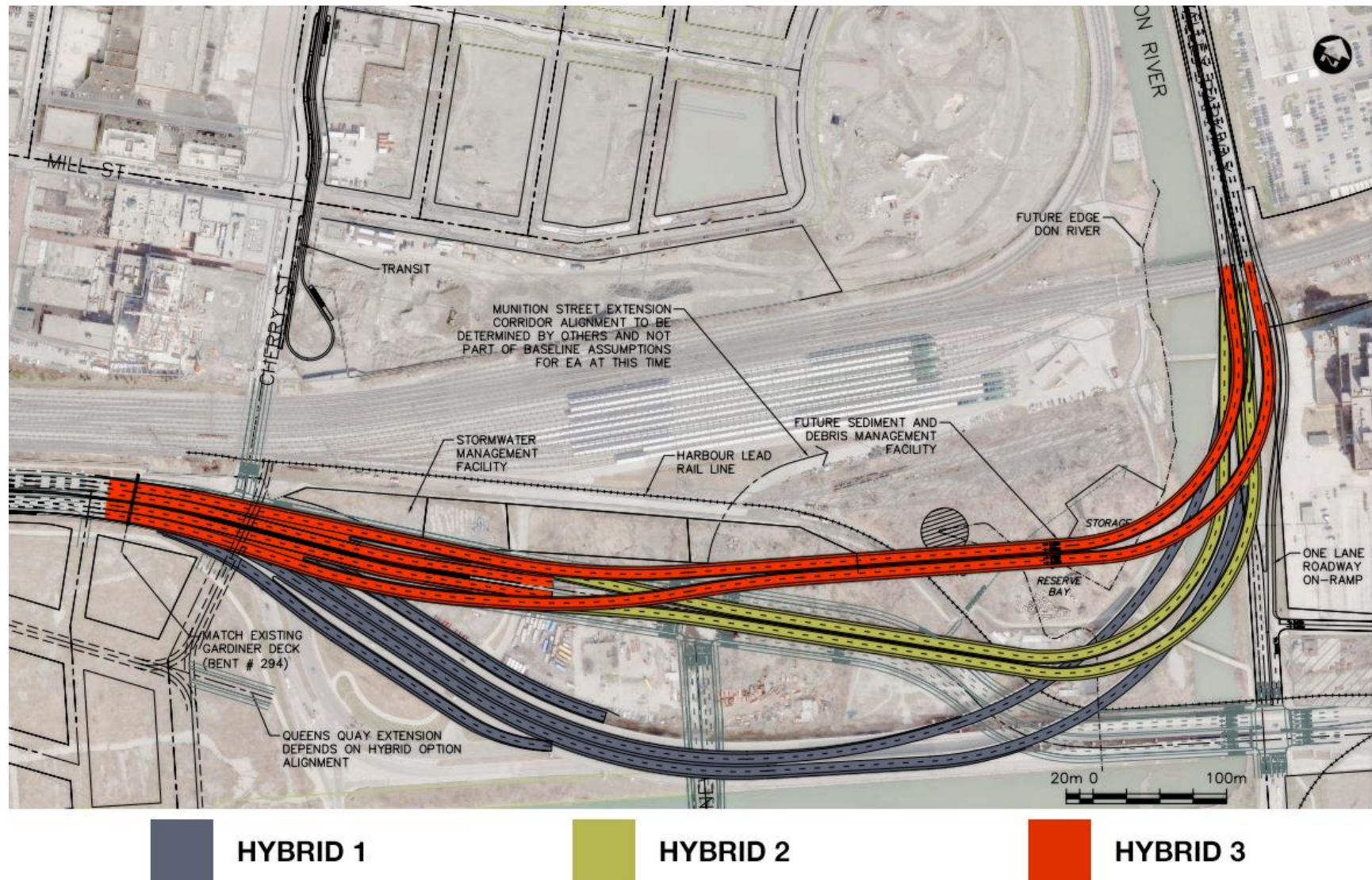


Figure 4.8: Hybrid Alternatives – Alignment Comparison



**Figure 4.9: Hybrid Alternatives – Future Buildout Comparison**



## 5. HYBRID DESIGN ALTERNATIVES EVALUATION

The evaluation of alternative designs focuses on the three identified Hybrid alternatives that are located in the Keating Precinct as previously presented in Chapter 4.0. For the other two segments of the study area (west of Cherry Street and east of the Don Roadway), alternative designs that would require EA approval were not identified. The following presents the Hybrid design alternatives evaluation approach and the results of the evaluation.

### 5.1. Evaluation Criteria

The assessment and evaluation of the Hybrid design alternatives was based on a set of evaluation criteria and measures that were developed by the City, Waterfront Toronto, the Consulting Team and stakeholders. The draft criteria were presented to the Stakeholder Advisory Committee (SAC) in the Fall 2015 in conjunction with the review of the draft design alternatives. Comments received on the criteria were considered in their finalization. For each of the criteria, one or more measures were developed. The measures specify the data to be collected and/or the effects to be assessed for each criterion. The criteria and measures considered in the evaluation are organized on the basis of the four study lenses (see below) and 16 criteria groups as outlined in the EA Terms of reference and used from the outset of this EA study process, including the alternative solutions evaluation completed in 2014 and 2015. The four study lenses are Transportation and Infrastructure, Urban Design, Economics and Environment. Minor revisions were made to the criteria / measures to more specifically address the differences among the three Hybrid design alternatives and to better explain what is being measured. **Table 5.1** provides the criteria groups, criteria and definitions.





**Table 5.1: Hybrid Alternative Designs Evaluation Criteria Groups and Criteria**

Study Lens/ Criteria Group	Criteria	Definition
<b>TRANSPORTATION and INFRASTRUCTURE</b>		
<b>Automobiles</b>	Commuter Travel Time (Average travel time for AM and PM peak hour) within Downtown / Transportation Study Area	Average in-bound peak hour travel time between representative Origin-Destination (O-D) pairs.
	Impact on Average Auto Travel Time (AM peak hour.) within Downtown/ Primary Transportation Study Area	Change in average peak hour travel times (all directions for local traffic trips within the area of Spadina Avenue and Woodbine Avenue and south of Dundas Street).
	Road Network Flexibility/ Choice	Ability to accommodate traffic demand, minimize turning prohibitions, accommodate future road infrastructure changes, and accommodate new/future development with new road access.
<b>Transit</b>	Transit Impact	Ability to accommodate new/future waterfront transit service.
<b>Pedestrians</b>	Pedestrian Access Through Keating Precinct	Ability to implement an attractive and safe pedestrian environment that allows for east-west and north-south travel including connections at Cherry Street and into the Port Lands.
<b>Cycling</b>	East-West Movement	Ability to accommodate east-west cycling facilities and opportunities to connect with existing and planned north-south cycling facilities.
<b>Movement of Goods</b>	Travel Time	Potential for changes in travel times for the movement of goods.
	Reliability	Ability to manage traffic incidents in the corridor.
	Transport and Shipper Cost	Transportation costs can be impacted by a number of factors including mode of transport choice, service standards required, regulations, etc. Increase in travel time increases costs to carriers and transporters (increased fuel consumption, driver time, need for more trucks on the road).
<b>Safety</b>	Pedestrian conflict points	Traffic exposure risk for pedestrians at intersections and crossing Lake Shore Boulevard considering width/distance of roadway to cross, intersection configuration and sightlines.
	Cyclist conflict points	Extent to which cyclists are exposed to free flowing/uncontrolled auto traffic flow. This includes free flowing access ramps to and from the Gardiner Expressway where automobile traffic has the right of way.
	Motorist conflict points for at-Grade Roadways	Extent to which there are road safety concerns for motorists. Includes poor sightlines, access ramps and intersection configuration.

Study Lens/ Criteria Group	Criteria	Definition
	Safety Risk for Motorists on Gardiner Expressway	Extent of expressway road geometry that poses safety risk for drivers, particularly lack of shoulders.
<b>Construction Impact</b>	Duration and Extent of Construction Impact	Number of years required to complete construction, with an emphasis on the number of years that will result in traffic impacts. Potential for traffic infiltration onto side streets. Extent of pedestrian and cycling facilities to be affected during construction.
	Private Property	Extent of private property to be used during construction and potential for access to private properties (e.g. driveways) to be impacted.
<b>URBAN DESIGN</b>		
<b>Planning</b>	Consistency with Official Plans	Extent to which the principles and recommendations of the City's Official Plan and the Central Waterfront Secondary Plan are accommodated and supported.
	Consistency with Precinct Plans and other Plans and Initiatives	Impact on planned improvements to the Cherry Street/Lake Shore Boulevard intersection and its ability to serve as a gateway to the Port Lands. Impact on development phasing of waterfront precincts. Extent to which the goals, objectives and recommendations of the East Bayfront and Keating Precinct Plans are accommodated and supported as well the Don Mouth Naturalization Project EA and the Port Lands and South of Eastern TSMP EA Study.
<b>Public Realm</b>	Streetscape	Quality of place along Lake Shore Boulevard, Queens Quay extension and within the Keating Precinct. Ability to create attractive and consistent streetscapes in Keating Precinct.
	View Corridors	Ability to create high quality visual connections along roadways, among the Precincts, and to/from the water, including visual connections along waterfront and over the Don River.
	Public Realm	Ability to create an attractive public realm in the Keating Precinct including pedestrian areas, patios, passive recreation, multi-use trails and streetscaping. Ability to create an attractive pedestrian promenade with connection to the Keating Precinct.
	New Open Space	Area and quality of open space in the Keating Precinct that would be usable, complements the waterfront promenade and accommodates the cycling trail network.
<b>Built Form</b>	Street Frontage	Length of leasable, active, at-grade space along Lake Shore Boulevard and Queens Quay that would support high quality development including retail. Also considers the amount of above-grade development that would be negatively impacted by proximity to elevated expressway structures.

Study Lens/ Criteria Group	Criteria	Definition
<b>ENVIRONMENT</b>		
<b>Social &amp; Health</b>	Air Quality	Air quality conditions at the local and regional level, including changes in NOx, VOCs, PM2.5, as well as the level of greenhouse gas emissions.
	Noise	Noise level change at various receptors locations in the study area.
<b>Natural Environment</b>	Terrestrial Environment	Opportunity for new and/or enhanced land-based natural habitat, species and features.
	Aquatic Environment	Opportunity for new and/or enhanced aquatic-based habitat, species and features.
	Storm Water Quality	Proximity of roadway infrastructure to the Keating Channel and potential to impact water quality and manage the conditions/quality of water run-off to receiving water bodies.
	Storm Water Quantity	Potential impact (including benefits) on Don River flood water conveyance and resilience to climate change effects.
	Microclimate/Heat Island Effect	Local atmospheric conditions and ability for the road network to support a tree canopy and other landscaping.
<b>Cultural Resources</b>	Built Heritage	Potential for impact on historic physical architecture and cultural property that is inherited and maintained within the corridor.
	Cultural Landscape	Potential for impact on the existence of a built or natural landscape that is valued by people for its religious, artistic or cultural associations within the corridor.
	Archaeology	Potential for impact on known buried resources or artifacts within the corridor.
	First Nations People and Activities	Potential for impact on the use of the study area by First Nations for traditional purposes.
<b>ECONOMICS</b>		
<b>Global &amp; Regional Economics</b>	Toronto's Global Competitiveness	Influence on change in the global attractiveness of the City of Toronto.
	Regional Labour Force Access	Potential for change in level of access to/from the downtown core.
	Mobility within Downtown	Potential for change in worker mobility in the downtown core/CBD and disruption during construction.
	Entertainment Venues	Potential for change in access to major entertainment venues in the downtown (e.g. ACC, Rogers Centre, etc.) and change in their ability to attract visitors.
<b>Local Economics</b>	Business Activity	Number of jobs created in the corridor and/or study area.
<b>Direct Cost &amp; Benefit</b>	Capital Cost	Capital cost to construct the alternatives and identification of potential private property needs.
	Lifecycle Cost	Net present value of construction cost and 100-year operations and maintenance costs of the alternative.
	Public Land Value Creation	Amount of money that could be generated in Keating Precinct and adjacent affected areas (e.g. Villiers Island) through the creation and sale of new land for the City.

## 5.2. Effects Assessment & Evaluation Approach

Data for each of the design alternatives was collected on the basis of the evaluation criteria as presented in **Table 5.1** above and in **Table 5.2** presented further below. To compare the advantages and disadvantages of the designs, both construction effects and long-term operations effects were considered and assessed based on the criteria and measures. Considering this data, design alternative preference rankings were then determined for each measure and these rankings were considered to generate preference rankings by criteria group. It is typical that in EA studies there is not one design alternative that is preferred for *all* the evaluation criteria. As such, when comparing among design alternatives, there are often trade-offs that need to be made to select the technically preferred design. This was the case with the Gardiner Hybrid alternative designs. As both quantitative and qualitative data was collected, the evaluation of the design alternatives was undertaken using a qualitative “reasoned argument” approach as outlined in the approved EA Terms of Reference.

## 5.3. Consideration of Public Input

Consultation activities associated with the development and evaluation of the Hybrid design alternatives were focused on the engagement of the Stakeholder Advisory Committee (SAC), the holding of the fifth public meeting (January 19, 2016) with a live web cast of the January 19 event, the release of the presentation package on the project web site, and an open comment period following the public meeting. There were four SAC meetings held between June 2015 and January 2016 to discuss draft Hybrid design alternatives and preliminary evaluation considerations. On January 14, 2016, the materials for the January 19, 2016 public meeting were presented to the SAC for input. At this SAC meeting, the project team also received feedback on the final evaluation results of the hybrid design alternatives.

The public consultation event on January 19<sup>th</sup> saw over 300 participants and another 60 watched the live webcast of the presentation and participated online. More than 60 people also completed an online survey on the project website and many others weighed in via Twitter to provide their feedback on the evaluation of design alternatives and urban design concepts for the study area. In total, including website visits, almost 3,700 individuals participated in the evaluation of design alternatives consultation process between January 5 (when the public notice was issued) and January 29, 2016. The details of the consultation activities are documented in the Round Five Consultation Report, prepared by Lura Consultants appended to the City Staff Report (2016) on the Gardiner East EA. The key questions asked at the consultation events were:

- Thinking about the results of the evaluation of alternative alignments for the hybrid option...
  - What do you like?
  - What concerns do you have?
  - What refinements, if any, would you like to see explored?
- Thinking about the urban design concepts presented for the study area...
  - What do you like?

- What concerns do you have?
- What refinements, if any, would you like to see explored?

In comparing the three Hybrid design alternatives and associated public realm plans, most consultation participants expressed support for either Hybrid 2 or 3, with Hybrid 3 receiving the most positive feedback as it moves the expressway furthest from the Keating Channel and the Mouth of the Don River. Very little support was expressed for Hybrid 1. Public commentary on the design alternatives is presented below:

### **Hybrid Design Concept 1 (South)**

Participants who expressed support for Hybrid 1 noted:

- It maintains road capacity for vehicles and passengers that use it daily and would prevent the infiltration of traffic into local neighbourhoods;
- Lower project costs and shorter construction period is preferred;
- Maintains some of the best views of the City, Toronto Islands and harbor; and
- Hybrid 2 or 3 could result in the development of high-rise buildings that would block views of the City and waterfront from the highway.

Concerns with Hybrid 1 included:

- The alignment places the corridor too close to the Keating Channel and does not significantly improve the urban fabric of the study area;
- Concerned about the lack of improvement to environmental conditions (i.e., air and noise quality, viewsheds); and,
- Future buildings developed between the Gardiner Expressway and railway would be isolated.

### **Hybrid Design Concept 2 (Mid-Precinct)**

Participants who expressed support for Hybrid 2 noted:

- It moves the expressway corridor closer to the railway and away from the Keating Channel, increasing opportunities for future development and public realm improvements along the waterfront;
- Improves north-south connectivity, specifically where north-south streets intersect with Lake Shore Boulevard;
- Improved public access to the waterfront and Port Lands;
- Extending Queens Quay to Munition Street increases connectivity;
- The ability to begin construction before tearing down the existing is beneficial, as it minimizes the need to detour traffic and congestion;
- Improved safety with safer ramps; and
- Benefits from increasing open space and improving bike and pedestrian trails.

Concerns with Hybrid 2 included:

- The location of public open space is isolated and the lack of development on the north side of the re-aligned expressway reduces the open space quality and value; and,
- The lack of development on the north side of the boulevard renders the point of creating a boulevard moot.

### **Hybrid Design Concept 3 (North)**

Participants who expressed support for Hybrid 3 noted:

- It achieves the most goals outlined for the EA, particularly revitalizing the waterfront and reconnecting the City with the lake
- It moves the expressway corridor closer to the railway and away from the Keating Channel, increasing opportunities for future development and public realm improvements along the waterfront;
- Releases public land on the north side of the Keating Channel for other uses (e.g., development, public space, etc.);
- Improves public access to the waterfront, particularly in terms of north-south connectivity;
- Locating on/off ramps within the corridor consolidates the infrastructure away from other valuable space;
- Maintaining expressway capacity during most of the construction period is beneficial;
- Benefits from increasing open space and improving bike and pedestrian trails;
- The tighter curve that connects the elevated expressway with the Don Valley Parkway along the railway corridor, creates the most public realm benefits;
- Enables more two-sided public realm improvements along Lake Shore Boulevard corridor (i.e., landscaping) east of Munition Street;
- Maximizes opportunities to revitalize the Keating Channel Precinct;
- Improves the at-grade experience for pedestrians and cyclists; and,
- Moving the alignment closer to the railway corridor reduces the overall impact of the expressway when looking north from the Keating Precinct and will highlight planned improvements to the mouth of the Don River.

Concerns with Hybrid 3 included:

- The location of public open space is isolated and the lack of development on the north side of the re-aligned expressway reduces the open space quality and value;
- The lack of development on the north side of the boulevard renders the point of creating a boulevard moot;
- Concerned with slower speeds associated with the tighter curve connection between the DVP and Gardiner – drivers may not adjust their speed as needed – could be a safety concern with accidents and congestion.

Regarding costs, recurring feedback indicated that many participants are not overly concerned about the higher estimated costs for Hybrid 3. They noted that while Hybrid 3 is more expensive relative to Hybrid 1 and 2 from an economic perspective, they feel that the potential urban design and public realm benefits (e.g., improved waterfront access, land freed for other uses) are worth the additional cost. Participants who did express concerns about the estimated costs for Hybrid 2 and 3 typically argued that the money would be better spent on other City priorities (e.g., public transit).

Participants also noted that the costs and land value estimates did not reflect future benefits from higher market assessments and property taxes on the land freed for other uses.

Some participants did provide several specific suggestions to refine Hybrid 3, including:

- Move the alignment further north (e.g., over railway corridor, over water treatment facility);
- Stack the expressway over the rail corridor;
- Utilize a variety of signals to encourage drivers to slow down where the expressway curves to connect to the Don Valley Parkway (e.g., flashing lights, digital speed indicators, grooved pavement); and
- Consider combining Hybrid 3 with the remove alternative (e.g., an eight-lane boulevard that connects to the expressway between Parliament and Jarvis Streets)

To summarize, Hybrid 3 received the most positive feedback as its moves the expressway furthest from the Keating Channel and the Mouth of the Don River.

## 5.4. Comparative Evaluation of Alternatives

**Table 5.2** presents the Hybrid alternative designs assessment results and comparative preference rankings by evaluation criterion for the 16 criteria groups. For each criteria group, the design concepts have been relatively compared and assigned a preference level of: “Preferred”, “Less Preferred”, or Equally Preferred. The assigned preference levels are relative, not measures of acceptability/unacceptability. As such, an assignment of Less Preferred does not necessarily mean that the design alternative is considered to be unacceptable for a particular measure, criterion, or criteria group, just less preferred than the other design alternative(s). The preference levels by criteria group were considered in the overall evaluation to identify a preferred design alternative.

## 5.5. Criteria Group Discussion

The following provides a description of the differences among the three design alternatives by each of the four evaluation lenses. The process to generate the data and interpret the data is similar to that previously outlined in the Dillon Consulting February 2014 Gardiner East EA Interim Alternatives Solution Evaluation Report and is not repeated in this report.

### 5.5.1. Transportation and Infrastructure Lens

The assessment of transportation and infrastructure resulted in the following summary of findings:

- All three Hybrid design alternatives have similar auto travel time and capacity along the corridor;
- Traffic modeling completed confirms the need for new access ramps at Cherry Street to replace the Logan ramps that would be removed east of the Don Roadway under all three Hybrid alternatives;
- Similar auto travel demand/volume is anticipated on Lake Shore Boulevard under all three design alternatives;
- Lower speeds on the new Gardiner-DVP ramps required for Hybrid design alternatives 2 (mid-precinct) and 3 (north) are expected to have no material impact on the City scale projected auto travel times during the peak travel period;
- Construction periods for design alternatives 2 and 3 are slightly longer and require greater traffic detours than for alternative 1 as they include rebuilding the Gardiner-DVP ramps; and,
- Design alternatives 2 and 3 facilitate the implementation of a preferred surface street network and possible transit extension into Keating Precinct (with a Queens Quay extension) that is not possible under design alternative 1.

Of the assessment criteria within the Transportation and Infrastructure lens, Safety and Constructability received more attention by some stakeholders. The following provides commentary on the assessment of Safety and Constructability.

#### 5.5.1.1. Safety Criteria Group

This criteria group considered four criteria: 1) Pedestrian conflict points; 2) Cyclist conflict points; 3) Motorist conflict points at-grade; and 4) Safety risk for motorists on the Gardiner Expressway.

For criteria 1 and 2, the assessment of the pedestrian and cycling safety focused on potential conflicts related to crossing Lake Shore Boulevard, presence of Gardiner access ramps, and sightlines for pedestrians and cyclists. For cyclist safety, the assessment found no difference among the design alternatives in conflict points through Keating Precinct. All three design alternatives include a separated multi-use path for cyclists that would be unobstructed by the Gardiner. For pedestrian safety, design alternative 1 (south) presents greater risks for pedestrians trying to access the waterfront and Keating Channel as they would need to cross the Gardiner ramp access roads. The access ramps to and from the Gardiner will minimize the locations where pedestrian access to the waterfront is possible. This may result in more pedestrian conflicts, whereas design alternatives 2 (mid-precinct) and 3 (north) locate the access ramps north of the water's edge and do not prevent pedestrian access to the water's edge.



In developing the alternative designs, Dillon completed a safety assessment of the design alternatives. In addition, an independent safety audit of the Hybrid alternatives was completed by AECOM. The safety review focused on the ramp geometry connecting the Gardiner and DVP as well as the new ramp connection to the east of Cherry Street that are included in each of the Hybrid alternative designs. Input from this review resulted in some revisions being made to the alternative designs. This included the provision of full shoulders to the ramps for Hybrid 2 and 3, revisions to ramp profiles to improve sightlines and adjustments to the design of the ramp entrances. AECOM's safety review and Dillon's response to it are available in **Appendix B**. Key conclusions of the safety assessment include:

- **Hybrid Design Alternative 1 (south)** (Reminder: This design alternative utilizes the existing ramps connecting the Gardiner-DVP):
  - The existing Gardiner-DVP Ramps do not meet current road engineering standards as the ramps do not have roadway shoulders and there are some constrained sightlines for motorists. There may be an opportunity to provide wider ramp shoulders when ramps are redecked in the future but the ability to accommodate this needs to be confirmed during detailed design;
  - Despite the road design not being up to modern standards, few traffic collisions occur;
  - There are potential sight line issues with the new eastbound off-ramp from the Gardiner to Lake Shore Boulevard. The presence of the expressway columns connecting the Gardiner to the DVP may impact sightlines for those coming down the eastbound off-ramp; and,
  - With the new westbound on-ramp, there are potential weaving issues between those motorists entering westbound on the Gardiner from Lake Shore Boulevard with the westbound motorists coming from the DVP ramps and attempting to access the Sherbourne exit.
- **Hybrid Design Alternative 2 (mid-precinct)** and **Hybrid Design Alternative 3** have similar assessment results which include:
  - Rebuilding the Gardiner–DVP ramps allows the road design to include wider shoulders which will improve sightlines;
  - The new Gardiner-DVP ramps are designed with a tighter radius and as such require a lower posted travel speed along the ramps. There is the potential for drivers to expect higher Gardiner-DVP ramp speeds than the posted design speed 90 km/hr speed limit to transition to a 50km/hr speed limit. Signage and speed deceleration zones are required to accommodate the lower design speed ramps;
  - Ramps to and from the Gardiner and connecting the Gardiner-DVP can be designed to an acceptable level of safety with appropriate mitigation applied; and,
  - The placement of the Keating Precinct westbound on-ramp in the centre of the Gardiner footprint has less potential for traffic weaving conflict with DVP (southbound to westbound) traffic wanting to exit at Sherbourne Street.

Overall, with a lower design speed ramps under Hybrid 2 and 3 as compared to Hybrid 1, there is the potential that drivers might expect that they can operate their vehicle on approach to the curved portion of the DVP-Gardiner ramps at a higher speed than the ramp design speed. With appropriate mitigation including signage and speed deceleration zones, the ramps can be designed to an acceptable level of safety.

#### **5.5.1.2. Constructability Criteria Group**

Constructability is of interest to stakeholders to understand the amount and length of traffic disruption that could occur during the building of the infrastructure. A constructability phasing report was completed by Morrison Hershfield and is available in **Appendix C**.

The constructability assessment developed possible schemes and methodologies for constructing and staging the various road and bridge elements while maintaining road traffic in the area. This was completed to highlight potential differences amongst the Hybrid options. Key elements of the constructability assessment were:

- Maintaining an appropriate number of travel lanes within the Gardiner/LSB corridor during construction to ensure adequate capacity for local and through traffic;
- Removal of existing bridge deck sections will not be carried out over live traffic or public areas;
- The need to utilize some sections of existing roads in the immediate area for detour traffic while bridge works are ongoing. In some cases this will involve the local widening of existing area roads, including construction of a temporary timber deck bridge across the Keating Channel (approximately 80 m east of Cherry Street) to facilitate a new east-west detour of traffic around the prime construction area;
- The requirement to stage the demolition of the existing Gardiner/DVP ramps (i.e. partial deck removals) to maintain adequate traffic capacity; and,
- The scheduling of weekend and night time works when bridge demolition would pose potential safety concerns.

Below is a summary description of how the construction of each Hybrid design alternative would be phased.

#### **Hybrid Design Alternative 1 (South) Construction Staging – 4 years including 1 year advance work**

##### **Pre-stage – Detour Routes and Road Widening (1 year)**

- Widen the existing Don Roadway to two lanes in both the north-bound and south-bound directions and realign to fit the future final alignment;
- Construct a new six-lane eastbound/westbound detour from Don Roadway and LSB intersection, continue south to Villiers Street, across Villiers Street, and then back north of Keating Channel before finally connecting to the existing LSB west of Cherry Street;

- Widen the existing Jarvis Ramp and remark the pavement to carry two lanes with reduced speed (subject to Ramp changes as per Lower Yonge Precinct Plan/Class EA Study);
- Begin construction of the Gardiner Cherry Street ramp bridges; and,
- Construct portions of the new LSB roadway that are not in conflict with the existing structure or the existing LSB.

**Stage 1 – Westbound Demolition and Construction (1 year)**

- Demolish westbound lanes of Logan Ramp and Don River Bridge;
- Construct the north half of the Don River Bridge;
- Construct the west end of the Gardiner westbound lanes on ramp at Cherry Street; and
- Continue construction of the new LSB westbound lanes where not in conflict with the existing east to north DVP Ramp.

**Stage 2 – Eastbound Demolition and Construction (1 year)**

- Demolish eastbound lanes of Logan Ramp and Don River Bridge;
- Construct the south half of the Don River Bridge;
- Construct the east and west ends of the FGE eastbound lanes off ramp at Cherry Street;
- Complete construction of the new LSB.

**Stage 3 – Final Construction (1 year)**

- Remove the temporary structures for detours (e.g. timber deck bridge over Keating Channel); and,
- Finish the new Queens Quay, Munition Street, and other road work as required to be in alignment with the final configuration (subject to completion of other plans and approvals required for these other road works).

**Hybrid Design Alternative 2 (mid Precinct) Construction Staging – 5 years including 1 year advance work**

**Pre-stage – Detours and road widening's (1 year)**

- Widen the existing Don Roadway to two lanes in both the north-bound and south-bound directions and realign to fit the future final alignment;

- Construct a new six-lane eastbound/westbound detour from Don Roadway and LSB intersection, continue south to Villiers Street, across Villiers Street, and then back north of Keating Channel before finally connecting to the existing LSB west of Cherry Street;
- Widen existing Jarvis Ramp and remark the pavement to carry two lanes with reduced speed;
- Begin construction of the FGE Cherry Street Ramp Bridges (except the west ends) and the DVP Ramp Bridges (except the north and west ends); and
- Construct portions of the new LSB roadway that are not in conflict with the existing structure or the existing LSB.

#### **Stage 1 – Westbound Demolition and Construction (1 year)**

- Shut down and demolish the south to west DVP ramp, Gardiner westbound lane, Logan Ramp westbound, Don River Bridge westbound, and existing LSB westbound lanes;
- Construct the new Don River Bridge westbound;
- Construct the new south to west DVP Ramp and the remainder of the FGE westbound lanes on ramp at Cherry Street;
- Complete construction of the new LSB westbound lanes;
- Shift traffic on Don Roadway to the east side.

#### **Stage 2 – Eastbound Demolition and Construction (1 year)**

- Shut down and demolish the east to north DVP ramp, FGE eastbound lanes, Logan Ramp eastbound, Don River Bridge eastbound, and existing LSB eastbound lanes;
- Construct the new Don River Bridge eastbound;
- Construct the new east to north DVP Ramp and the remainder of the FGE eastbound lane off ramp at Cherry Street;
- Complete construction of the new LSB eastbound lanes; and,
- Shift traffic on Don Roadway to the west side.

#### **Stage 3 – Final Demolition and Construction (1 year)**

- Remove the temporary structures for detours (e.g. timber deck bridge over Keating Channel);

- Finish the new Queens Quay, Munition Street, Don Roadway and other road work as required to be in alignment with the final configuration. (subject to completion of other plans and approvals required for these other road works).

### **Hybrid Design Alternative 3 (North) Construction Staging – 5 years including 1 year advance work**

#### **Pre-stage – Demolition, Detours and Road Widening's (1 year)**

- Remove Metrolinx Rail Bridge for the segment crossing over the existing Don Roadway, while minimizing disruption to rail service;
- Widen the existing Don Roadway to two lanes in both the north-bound and south-bound directions and realign to fit the future final alignment;
- Construct a new six-lane eastbound/westbound detour from Don Roadway and LSB intersection, continue south to Villiers Street, across Villiers Street, and then back north of Keating Channel before finally connecting to the existing LSB west of Cherry Street;
- Widen Jarvis Ramp and remark the pavement to carry two lanes with reduced speed;
- Begin construction of the FGE Cherry Street Ramp Bridges (except the west ends) and the DVP Ramp Bridges (except the north and west ends);
- Construct portions of the new LSB roadway that are not in conflict with the existing structure or the existing LSB; and
- Reconstruct a longer Metrolinx rail bridge for the segment crossing over the existing Don Roadway.

#### **Stage 1 – Westbound Demolition and Construction (1 year)**

- Shut down and demolish the south to west DVP ramp, Gardiner westbound lanes, Logan Ramp westbound, Don River Bridge westbound, and existing LSB westbound lanes;
- Construct the new Don River Bridge westbound;
- Construct the new south to west DVP Ramp and the remainder of the FGE westbound lane on ramp at Cherry Street;
- Complete construction of the new LSB westbound lane; and
- Shift traffic on Don Roadway to the east side.

### **Stage 2 – Eastbound Demolition and Construction (1 year)**

- Shut down and demolish the east-to north DVP ramp, Gardiner eastbound lane, Logan Ramp eastbound, Don River Bridge eastbound, and existing LSB eastbound lanes;
- Construct the new Don River Bridge eastbound;
- Construct the new east to north DVP Ramp and the remainder of the FGE eastbound lanes off ramp at Cherry Street;
- Complete construction of the new LSB eastbound lanes; and
- Shift traffic on Don Roadway to the west side.

### **Stage 3 – Final Demolition and Construction (1 year)**

- Remove the temporary structures for detours (e.g. timber deck bridge over Keating Channel); and
- Finish the new Queens Quay, Munition Street, Don Roadway and other road work as required to be in alignment with the final configuration.

For all of the design alternatives, construction of the realigned Lake Shore Blvd can largely be done while maintaining the operation of the current Lake Shore Boulevard. Considering the above, Hybrid design alternative 1 is expected to involve the shortest construction period at 4 years, and includes the shortest period of traffic detours and is therefore preferred. Hybrid design alternatives 2 and 3 are less preferred than Hybrid 1 as they involve 5 year construction periods with greater detour requirements and traffic delay to build the new Gardiner-DVP ramp connections. Hybrid design alternative 3 is considered to be preferred over Hybrid 2 as a greater portion of the ramps can be constructed without traffic disturbance and the widening of the Don River/DVP rail underpass could provide roadway detour opportunities and thus reduce delays to traffic during construction.

## **5.5.2. Urban Design Lens**

The Urban Design lens considers three criteria groups: Planning, Public Realm and Built Form. The greatest influence on the urban design potential for the Keating Precinct is the location of the ramps connecting the Gardiner to the DVP. **Figures 5.1, 5.2 and 5.3** provide the urban design plans for each of the three Hybrid design alternatives which were considered in the evaluation.

Figure 5.1: Hybrid Design Alternative 1 (South) – Urban Design Plan

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## HYBRID ALTERNATIVE 1

PUBLIC OPENSOURCE - SOFTSCAPE   
PUBLIC OPENSOURCE - HARDSCAPE   
DON RIVER NATURALIZATION AREA 



Figure 5.2: Hybrid Design Alternative 2 (Mid-Precinct) – Urban Design Plan

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PUBLIC OPENSOURCE - SOFTSCAPE   
PUBLIC OPENSOURCE - HARDSCAPE   
DON RIVER NATURALIZATION AREA 

## HYBRID ALTERNATIVE 2



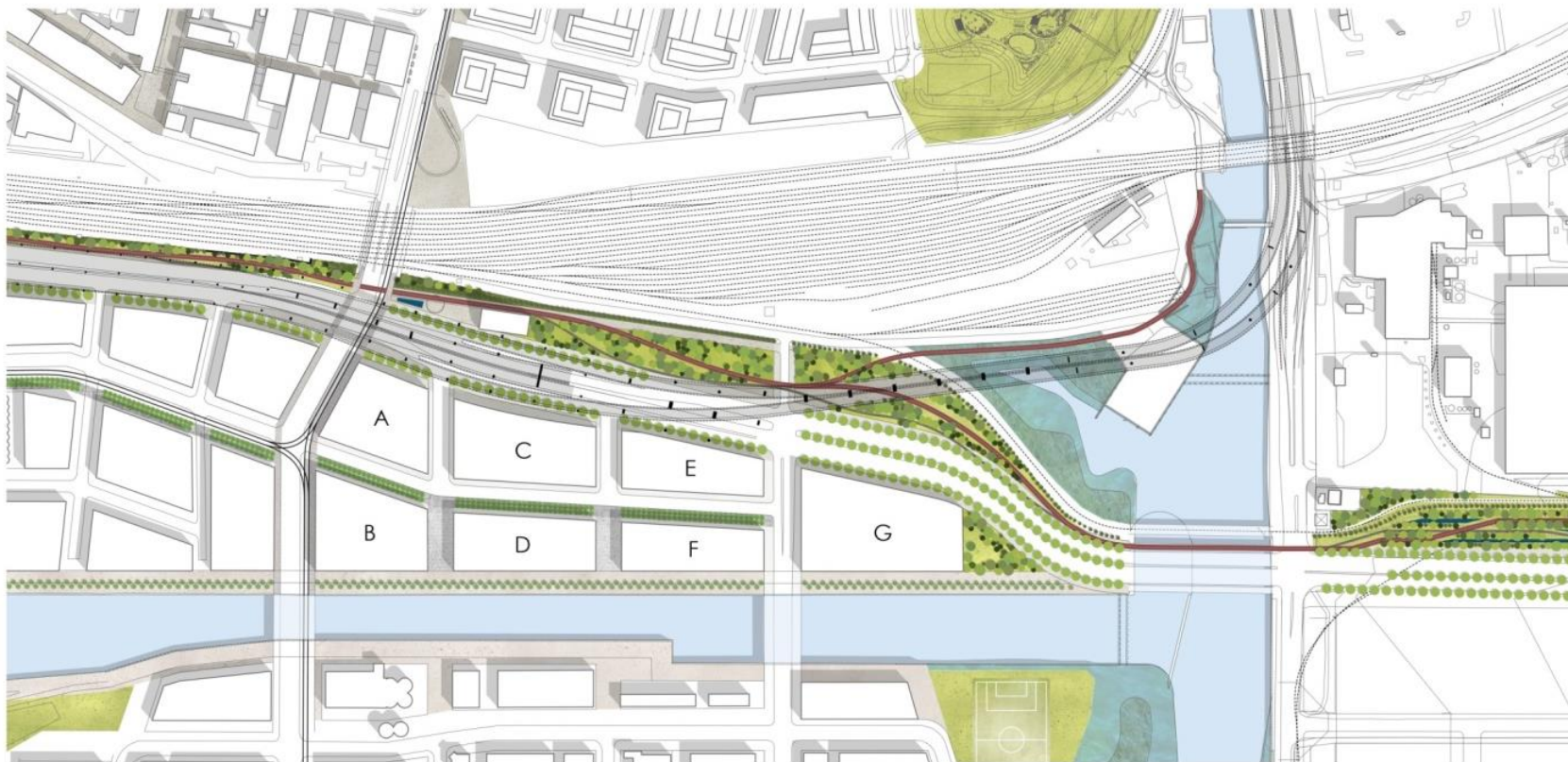


Figure 5.3: Hybrid Design Alternative 3 (North) – Urban Design Plan

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PUBLIC OPENSOURCE - SOFTSCAPE   
PUBLIC OPENSOURCE - HARDSCAPE   
DON RIVER NATURALIZATION AREA 

## HYBRID ALTERNATIVE 3



### 5.5.2.1. Planning

In regards to the Planning criteria group, the Hybrid design alternative 1 (south) is less preferred when considering consistency with Precinct Plans. This is because the new Gardiner- Lake Shore Boulevard on/off ramps access roads would result in the loss of public space in the Keating Precinct, negatively impact the water's edge, and limit pedestrian access between the Keating Channel and the realigned Lake Shore Boulevard Hybrid design alternatives 2 (mid) and 3 (north) are equally preferred as both provide opportunities to improve Keating Precinct development and add public space.

### 5.5.2.2. Public Realm

Hybrid design alternative 1 is less preferred for all Public Realm criteria including streetscape, view corridors, public realm and open space. This design alternative does not allow for the full extension of Queens Quay East, minimizes public access to the Keating Channel and disrupts view corridors to the waterfront. Hybrid design alternative 2 is moderately preferred, with the achievement of the Queens Quay East extension, an unencumbered water's edge along Keating Channel, and improved connections for Munition Street. Hybrid design alternative 3 further improves on alternative 2 and is preferred for Public Realm. In addition to achieving the improvements noted for alternative 2, it provides the greatest opportunities for landscape and visual connections along Lake Shore Boulevard and the Don River. **Figures 5.4, 5.5 and 5.6** illustrate the potential for the Keating Channel Water's Edge Promenade for each Hybrid design alternative. Also, Section 6.1 provides a description of the public realm improvements that are proposed for the entire East Gardiner corridor.

**Figure 5.4: Hybrid Design Alternative 1 – Keating Channel Water's Edge Promenade**



**Figure 5.5: Hybrid Design Alternative 2 – Keating Channel Water’s Edge Promenade**



**Figure 5.6: Hybrid Design Alternative 3 – Keating Channel Water’s Edge Promenade**



### 5.5.2.3. Built Form

Hybrid design alternative 1 allows for Lake Shore Boulevard to be a two-sided street with development on the north and south sides. However, this alternative presents the greatest proportion of above-grade development that is compromised due to the proximity of the units to the elevated Gardiner structure. Although Hybrid design alternatives 2 and 3 do not provide for a two-sided Lake Shore Boulevard, they do present a two-sided Queens Quay which is of greater value than a two-sided Lake Shore Boulevard. This is because Queens Quay is a more pedestrian scale streetscape than Lake Shore Boulevard and would provide high-quality leasable at-grade development space, including retail. Hybrid design alternative 3 is preferred over alternative 2 as it also provides the least amount of above-grade development in proximity to the elevated Gardiner structure. **Figures 5.7, 5.8 and 5.9** present the built form potential under each Hybrid design alternative.

Considering the above, design alternative 3 (north) is preferred for the Urban Design lens.

**Figure 5.7: Hybrid Design Alternative 1 – Keating Precinct Conceptual Built Form**



**Figure 5.8: Hybrid Design Alternative 2 – Keating Precinct Conceptual Built Form**



**Figure 5.9: Hybrid Design Alternative 3 – Keating Precinct Conceptual Built Form**



### **5.5.3. Environment Lens**

The Environment Lens is concerned with noise and air quality, natural habitat, water quality and water quantity. Recognizing the baseline conditions of the corridor, many of the noise/air receptor locations represent future residential development locations as lands in Keating Precinct are either vacant or are to be redeveloped. With construction of the Hybrid alternatives assumed to occur in the 2020-2025 period, it is unlikely that there would be receptors in the Keating Precinct and construction disturbance effects to adjacent properties would be minimal.

#### **5.5.3.1. Natural Environment**

The corridor is highly degraded due to historical development and land use activities. The only natural feature of note is the mouth of the Don River/Keating Channel which is proposed to be realigned and re-naturalized. It is anticipated that the Don Mouth naturalization project would be constructed over a similar time period as the preferred Hybrid alternative and thus the river mouth and immediate upstream area would already be subject to disruption from that project. Hybrid design alternatives 2 and 3 present opportunities to complement the enhancement of the natural environment of the Don River with the removal of the existing Gardiner-DVP ramp connections and the redevelopment of new connections that can be more appropriately located north of the Don River mouth. Further, the extension of Queens Quay east of Cherry Street allows for additional planting and landscaping in alternatives 2 and 3 over Hybrid design alternative 1. This additional planting and landscaping could be placed along the north side of the Keating Channel that could be integrated with riparian habitat in the Channel. This would not be possible under Hybrid design alternative 1.

Considering aquatic habitat in the Keating Channel, with the removal of expressway infrastructure along the north side of the Keating Channel, design alternatives 2 and 3 are expected to provide greater opportunity for the enhancement of aquatic habitat in the channel.

#### **5.5.3.2. Social & Health**

Regarding potential noise effects, most of the receptors potentially affected in the study area are future receptors. In the future condition, Hybrid design alternative 1 will have more above-grade development units with residential/commercial/office receptors in proximity to the elevated expressway. Hybrid alternative 1 also affords limited possibilities for development to provide building shield effects that would minimize noise from the expressway. Hybrid design alternatives 2 and 3 present the opportunity for development blocks to shield noise effects of the expressway on future receptors along Queens Quay and along the Keating Channel (including Villiers Island). For the noise criteria, Hybrid design alternatives 2 and 3 are preferred over alternative 1. Regarding air quality, all three design alternatives are equally preferred as there would be no noticeable difference in emissions among the alternative designs as the traffic volume is similar in all scenarios.

### 5.5.3.3. Water Quality

Hybrid design alternatives 2 and 3 present opportunities for surface water quality improvements. With the expressway rebuilt further north, removed from the Keating Channel, and new Gardiner-DVP ramp connections, it is possible to incorporate improved storm water run-off management into new infrastructure in a more sustainable manner. The expressway would also be further removed from the Channel and have less potential for direct run-off into the channel.

The Don River Mouth Naturalization Project and associated Don River flood water conveyance and sediment management operations are an important component of the future conditions in the study area. The development of the design alternatives involved consultation with the Toronto and Region Conservation Authority to identify infrastructure changes that would minimize effects to the Don River naturalization plans and to identify opportunities where the design alternatives could enhance naturalization plans.

Hybrid design alternative 1 retains the Gardiner-DVP ramp connections over the Don River mouth. The locations of the expressway columns in the Don River under Hybrid design alternative 1 do not change. This condition is what the Don Mouth Naturalization Project team assumed would be in place when the designs of the future sediment management facility were prepared. As such, the sediment management facility would operate unchanged with design alternative 1.

Hybrid design alternative 2 could potentially disrupt sediment management operations due to the location of the new ramp columns. However, in consultation with TRCA it has been determined that the sediment management operations could be maintained with Hybrid design alternative 2 with minor changes to management activities. The advantage of Hybrid design alternative 2 is that the more northern alignment allows for the mouth of the Don River to be opened up and pulled away from the Keating Channel benefiting the Don River Mouth Naturalization efforts.

Hybrid design alternative 3 pulls the Gardiner-DVP ramps even further north and would result in the best solution for the Don River mouth to be opened up. Further, alternative 3 presents a design that has the least potential to impact sediment management operations with minor changes to the flood mitigation works.

### 5.5.3.4. Cultural Resources

The evaluation of the alternatives with respect to cultural resources was based on the work completed by ASI Inc. including the completion of a Stage 1 Archaeological Assessment Report that was accepted by the Ministry of Culture, Sport and Tourism. All Hybrid design alternatives would result in similar minimal effects to cultural heritage and archaeological resources. There is potential for effect on three archaeological features (Toronto Dry Dock, Toronto Iron Works, British American Oil). No mitigation measures are required for Toronto Iron Works or British American Oil. Archaeological monitoring of construction excavation would be required for the Toronto Dry Dock. Regarding Aboriginal archaeological resources, previous 19th and 20th century developments have removed features related

to traditional uses of lands by Aboriginal peoples. Effects to the activities and interests of First Nations Peoples is also not anticipated although discussions with First Nations continue.

Considering the above, for the Environment Lens, there is a preference for Hybrid design alternative 3, while Hybrid design alternative 2 is moderately preferred and Hybrid design alternative 1 is least preferred.

#### **5.5.4. Economics Lens**

The following describes the differences among the Hybrid design alternatives for Global, Regional and Local Economics, and for Direct Costs and Benefits criteria groups.

Based on the City's high global ranking and the negligible difference in travel times among the Hybrid designs, none of the alternatives is expected to have an impact on the City's global economic competitiveness. From a regional perspective, the regional attractiveness of downtown Toronto is not expected to change as a result of any of the Hybrid designs. Locally none of the Hybrid Designs is expected to affect mobility within the Downtown once constructed. However, during the construction period for the project, Hybrid design alternatives 2 and 3 will have greater impacts on local mobility during construction due to greater duration of traffic detour requirements than for Hybrid 1. All Hybrid design alternatives support similar levels of employment, including that all designs support the proposed First Gulf development that is projected to generate in excess of 25,000 new jobs.

The Direct Costs and Benefits criteria group considers three criteria: Capital Cost and Funding, Lifecycle Cost and Land Value Creation. Costs for Hybrid design alternatives outlined in this report represent high order-of-magnitude costs for comparative purposes only.

##### **5.5.4.1. Costing Approach**

Indicative cost estimates were prepared using comprehensive procedures suitable for a complex, urban infrastructure project. The employed methodology was peer reviewed and adjusted based on detailed comments. The final costing involved the determination of two cost streams: capital and operations/maintenance costs.

Major capital cost items (roadworks, structural work including new bridges and bridge demolition, utilities, traffic maintenance during construction etc.) were determined based on unit costs and plan quantities derived from the Hybrid detailed layout concept drawings. Unit costs were based on MTO's estimating guidelines/database adjusted upward to account for project specific and local City factors. For the new bridge works, a complexity factor of 2.6 was applied to account for the difficult urban city construction environment. Additional cost items were identified for related works such as utility relocations, traffic maintenance/detours, disposal of contaminated materials, landscaping and lump sum allowances for these items were included in the capital cost totals. Engineering and contingency costs of 25% were added to determine the final capital cost of the alternatives. The established costs were



reviewed and determined to be in-line and consistent with recent City costs for similar works in the downtown area.

For ongoing operations and maintenance costing, costs associated with projected remedial treatment occurrences were assigned throughout a 100 year time line using year 2013 construction unit rates without adjustment for inflation. These costs were based on ongoing and recent City costs for these types of remediation works.

For City budgeting based on this level of estimate, a 20% possible variance should be assumed.

Capital costs were estimated for new bridge and roadworks between Cherry Street to Logan Avenue in the east and for bridge deck replacement between Jarvis St and Cherry Street in the west. Estimates included determination of costs for the following new work components:

- Roadworks (Lake Shore Boulevard (LSB), intersecting roads and intersections);
- Structures (including demolition, bridge deck replacement on the Gardiner, other new road, ramp and rail bridges);
- Utility relocations;
- Traffic maintenance during construction;
- Other costs (landscaping and urban design, contaminated material removal etc.); and,
- Engineering and contingencies.

Costs were assigned to the 100 year LCCA timeline by assuming that the above noted capital works would be started in year 2020. Completion times for these capital works varied depending on the specific work as follows:

- Seven year completion period (i.e. to 2026) for LSB resurfacing and renewal west of Cherry Street, new LSB and sideroads east of Cherry Street, new LSB/Don River bridge; and,
- Four year completion period (i.e. to 2023) for bent relocations, new ramp structures, new DVP rail bridge, existing bridge/ramp deck demolition, and utility, traffic maintenance and public realm/landscaping elements and other miscellaneous and engineering/contingency costs).

Bridge deck renewal costs for the Gardiner section west of Cherry Street to Jarvis Street, including deck replacement, superstructure/bent repairs and steel painting, were assumed to start in 2022 with completion in seven years (2028). It was assumed that the new Gardiner decks will have a life span of 100 years, having been replaced with reinforcing materials inert to chlorides such as stainless steel and/or Glass Fibre Reinforced Polymer (GFRP) in conjunction with high performance concrete, waterproofing membranes and asphalt protection layers.

Ongoing operations and maintenance costs were assigned to the 100 year program period based on typical periods for bridge and road renewals in accordance with ongoing and recent city costs for these types of remediation works. All new bridges were assumed to have a 75 years life span. The LCCA analysis used costs calculated in 2013 dollars throughout with a 4% discount rate.

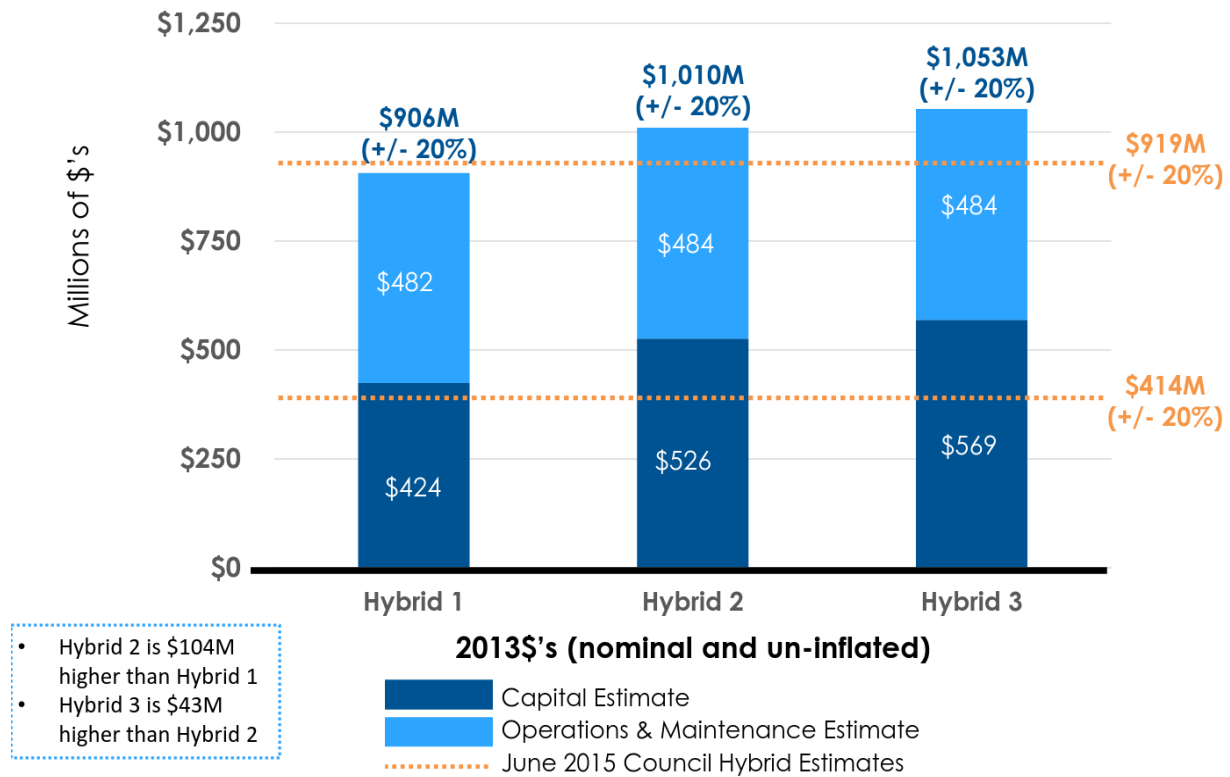
**Appendix D** further describes the assumptions regarding the capital cost calculations. The estimated costs that were developed are high-level estimates that were developed on the bases of the concept plans for each design alternative and are intended for comparative purposes.

#### 5.5.4.2. Costing Results

**Figures 5.10** and **5.11** present the estimated capital costs for the three Hybrid design alternatives. The Hybrid design alternative 1 has the lowest estimated infrastructure capital cost at \$424 million (2013\$) (\$267 million NPV). Design alternative 2 has the second lowest estimated infrastructure capital cost at \$526 million (2013\$) (\$348 million NPV) while design alternative 3 has the highest estimated infrastructure capital cost of \$569 million (2013\$) (\$379 million NPV). Also considered under this criterion was the measure Property Acquisition. During construction, design alternatives 2 and 3 have the potential to require property for construction detours. Further, there is the potential need for minimal private property acquisition along the east side of the Don Roadway for Hybrid design alternative 3 to accommodate a more northern new Gardiner-DVP ramp connection. Based on the Hybrid 3 concept design, about a 12 m encroachment into the First Gulf property just south of the Metrolinx rail tracks would be required. The property taking requirements will depend on the final road design and design of the flood protection landform that is required through this area to support future development on this site. As noted above, the First Gulf property acquisition costs have not been included in the total cost estimate as there may be opportunity to work some of the ramps/roadway design into the required flood protection landform which would not be available for development. This would need to be confirmed during detailed design.

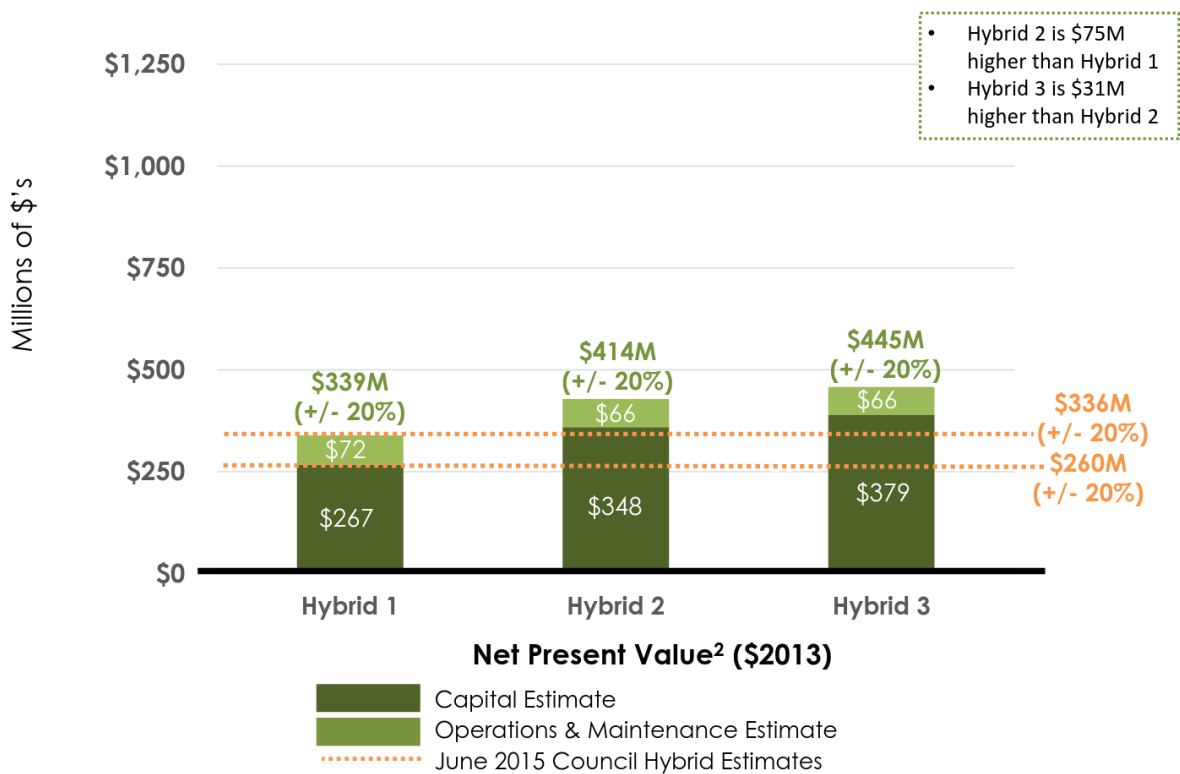
Lifecycle Infrastructure Costs as a net present value (NPV) were determined and include the total capital cost and the 100-year operations and maintenance costs for each alternative. Hybrid design alternative 1 was ranked *preferred* in this category with the lowest NPV lifecycle infrastructure cost (\$339 million). The 100-year NPV lifecycle infrastructure cost for hybrid design alternative 2 is \$414 million and for Hybrid design alternative 3 is \$445 million. **Figures 5.10** and **5.11** provide a breakdown of the 100-year lifecycle infrastructure costs in 2013\$ and NPV.

**Figure 5.10: Design Alternatives Lifecycle Infrastructure Costs 2013\$**



<sup>1</sup> All costs are high level order of magnitude prepared for comparative purposes only.

**Figure 5.11: Design Alternatives Infrastructure Lifecycle Costs NPV**



<sup>1</sup> All costs are high level order of magnitude prepared for comparative purposes only.  
<sup>2</sup> Future costs inflated to year of implementation and discounted 4% to \$2013

### 5.5.4.3. Land Value Creation and Net Cost

An analysis of potential revenues from the sale of City land under the three Hybrid design alternatives was undertaken by the independent firm of Cushman & Wakefield Associates who have extensive experience in the valuation of lands in Toronto including waterfront/Port Lands properties. (See **Appendix A** for the detailed Land Valuation Report.)

**Figure 5.12** illustrates the estimated public land value creation for each hybrid design alternative. The lands were valued in 2025\$ as the construction of the preferred Hybrid design is expected to be largely completed by then, allowing for the release of the Keating Precinct City properties for redevelopment at this time. Hybrid design alternative 1 would create 5 acres of public redevelopment land. Hybrid design alternatives 2 and 3 would both create 7.5 acres of public redevelopment land. This additional land results from the relocation of the elevated expressway and reduction in the expressway infrastructure through new design.

Potential revenues from the sale of these City-owned lands have been valued at approximately \$40 - \$50 million for alternative 1, \$70 - \$80 million for alternative 2, and \$72 - \$83 million for alternative 3. The reason Hybrid alternative 3 has a slight increase in value over Hybrid alternative 2 is that the

development blocks on the south side of Lake Shore Boulevard are set-back further from the Gardiner structure. It is also possible that Hybrid design alternatives 2 and 3 would also make the planned Villiers Island (which is mostly in public ownership) more attractive for development as a result of the two-sided unencumbered Water’s Edge Promenade along the Keating Channel.

**Figure 5.12: Design Alternatives Public Land Value Creation (2025\$)**



It should be noted that Cushman and Wakefield’s analysis of potential land sale revenues did not include the costs of soil and groundwater remediation because they are unknown at this time.

Further, the public realm costs for the full corridor were determined separately and are presented in Section 6.1 of this report. The public realm costs include the costs for the full study area extending from Jarvis Street to Logan Avenue. The results show that Hybrid design alternative 1 has a slightly higher public realm cost because it involves a greater length of treed median along Lake Shore Boulevard within the Keating Precinct and would require more public realm design intervention to improve the water’s edge promenade with the Gardiner Structure located adjacent to the Keating Channel. This additional public realm cost for Hybrid design alternative 1 does not change the relative cost rankings of the design alternatives.



**Table 5.2: Evaluation Matrix - Alternative Hybrid Designs**

Study Lens	Criteria Group	Criteria	Measures	Alternative Design 1	Alternative Design 2	Alternative Design 3
A. Transportation & Infrastructure	A.1 Automobiles	A 1.1 Commuter Travel Time (Modeled average travel time for AM & PM Peak Hour) Note: Transportation demand based on regional projections for growth expected by 2031 in addition to full build-out of East Bayfront, Keating, Port Lands).	Average travel times between representative Origins and Destinations	✓ Equally Preferred - All alternatives provide similar average travel times during peak period.	✓ Equally Preferred - All alternatives provide similar average travel times during peak period.	✓ Equally Preferred - All alternatives provide similar average travel times during peak period.
			Don Mills to CBD			
			Scarborough to CBD			
			Auto travel time sensitivity to future transit scenarios.	✓ Equally Preferred - Similar increase in travel times without planned transit projects.	✓ Equally Preferred - Similar increase in travel times without planned transit projects.	✓ Equally Preferred - Similar increase in travel times without planned transit projects.
		A 1.2 Impact on Average Auto Travel Time (AM peak hr.) Within Downtown/ Transportation Study Area	Total Volume Assigned (reflects available road capacity)	✓ Equally Preferred - 70,500 vph	✓ Equally Preferred - 70,500 vph	✓ Equally Preferred - 70,500 vph
			Percentage of vehicles experiencing increases in travel time over the future Base Case/Maintain	✓ Equally Preferred - 90% of traffic (64,500 vph) will be impacted by less than 2 min	✓ Equally Preferred - 90% of traffic (64,500 vph) will be impacted by less than 2 min	✓ Equally Preferred - 90% of traffic (64,500 vph) will be impacted by less than 2 min
			Trip Reduction/Diversion	✓ Equally Preferred - Approx 15%	✓ Equally Preferred - Approx 15%	✓ Equally Preferred - Approx 15%
			Overall impact on auto travel in Downtown	✓ Equally Preferred - Generates similar modelled auto travel times	✓ Equally Preferred - Generates similar modelled auto travel times	✓ Equally Preferred - Generates similar modelled auto travel times
		A 1.3 Road Network Flexibility/ Choice	Ability to accommodate traffic demand on Don Roadway	⊙ Moderately Preferred - Less flexibility to increase road capacity on Don Roadway	✓ Preferred - Greater flexibility to increase road capacity on Don Roadway	✓ Preferred - Greater flexibility to increase road capacity on Don Roadway
			Turning prohibitions at key intersections (Cherry, Munition, Don Roadway)	✓ Preferred - More turning options available at Munition St. intersection. Other intersections are equal.	⊙ Moderately Preferred - The west to south turn to travel south on Munition St. is restricted. Can use Don Roadway to access Port Lands. Other intersections are equal.	⊙ Moderately Preferred - The west to south turn to travel south on Munition St. is restricted. Can use Don Roadway to access Port Lands. Other intersections are equal.
			Ability to accommodate future changes to the Gardiner-LSB corridor	⊙ Moderately Preferred - Infrastructure alignment, ramp locations and separated Gardiner-LSB limit opportunities to accommodate future changes through the corridor.	✓ Preferred - Consolidated infrastructure provides opportunity to more easily accommodate future changes to Gardiner-LSB corridor.	✓ Preferred - Consolidated infrastructure provides opportunity to more easily accommodate future changes to Gardiner-LSB corridor.
			Ability to accommodate new roadway access to major planned developments	✓ Equally Preferred - All alternatives can accommodate potential new roadway access to the planned First Gulf development.	✓ Equally Preferred - All alternatives can accommodate potential new roadway access to the planned First Gulf development.	✓ Equally Preferred - All alternatives can accommodate potential new roadway access to the planned First Gulf development.
		<b>Automobiles Summary Ranking</b>				⊙ MODERATELY PREFERRED
A.2 Transit	A 2.1 Transit Impact	Flexibility to accommodate new transit along waterfront	⊙ Moderately Preferred - Does not permit full extension of Queens Quay into Keating Precinct and thus limits potential to accommodate Queens Quay transit extension.	✓ Preferred - Possible Queens Quay extension into Keating Precinct provides greater potential/ flexibility to expand future transit along the waterfront.	✓ Preferred - Possible Queens Quay extension into Keating Precinct provides greater potential/ flexibility to expand future transit along the waterfront.	
<b>Transit Summary Ranking</b>				⊙ MODERATELY PREFERRED	✓ PREFERRED	✓ PREFERRED
A.3 Pedestrians	A.3.1 Pedestrian Access Through Keating Precinct	Ability to implement an attractive and safe pedestrian environment that allows for east-west and north-south travel including connections at Cherry St and into the Port Lands	⊙ Moderately Preferred - Expressway infrastructure, including proposed ramps east of Cherry Street, restrict pedestrian environment and limit potential for pedestrian connections throughout the Keating Precinct.	✓ Preferred - Integrates a more attractive and safe pedestrian environment. New overhead expressway provides opportunity for reduced columns and flexibility in location to improve sightlines. Allows for extension of Queens Quay as a pedestrian attractive street.	✓ Preferred - Integrates a more attractive and safe pedestrian environment. New overhead expressway provides opportunity for reduced columns and flexibility in location to improve sightlines. Allows for extension of Queens Quay as a pedestrian attractive street.	
<b>Pedestrians Summary Ranking</b>				⊙ MODERATELY PREFERRED	✓ PREFERRED	✓ PREFERRED
A.4 Cycling	A 4.1 East-West Movement	Ability to accommodate a continuous E-W cycling trail along the corridor	✓ Equally Preferred - Total length of existing and proposed facility is 3,690 m in length between Yonge St. and Leslie St.	✓ Equally Preferred - Total length of existing and proposed facility is 3,690 m in length between Yonge St. and Leslie St.	✓ Equally Preferred - Total length of existing and proposed facility is 3,690 m in length between Yonge St. and Leslie St.	
			Connectivity with other planned and existing bikeway facilities including Cherry St. and Don Valley	✓ Equally Preferred - Connects with planned and existing cycling facilities.	✓ Equally Preferred - Connects with planned and existing cycling facilities.	✓ Equally Preferred - Connects with planned and existing cycling facilities.
<b>Cycling Summary Ranking</b>				✓ EQUALLY PREFERRED	✓ EQUALLY PREFERRED	✓ EQUALLY PREFERRED





**Table 5.2: Evaluation Matrix - Alternative Hybrid Designs**

Study Lens	Criteria Group	Criteria	Measures	Alternative Design 1	Alternative Design 2	Alternative Design 3
A.5 Movement of Goods	A 5.1 Travel Time	Modelled Average Travel Time (impact to truck movements)		✓ <b>Equally Preferred</b> - No noticeable difference in travel times, truck movements and Gardiner access among the alternatives.	✓ <b>Equally Preferred</b> - No noticeable difference in travel times, truck movements and Gardiner access among the alternatives.	✓ <b>Equally Preferred</b> - No noticeable difference in travel times, truck movements and Gardiner access among the alternatives.
	A 5.2 Reliability	Ability to manage traffic incidents in the corridor		● <b>Moderately Preferred</b> - Existing ramps have no shoulders. Less options for a relief route should an incident occur on LSB. This would impact travel speeds in the event of an incident on LSB. Future redecking might allow for wider shoulders but to be confirmed.	✓ <b>Preferred</b> - Ability to provide full shoulder on DVP-FGE ramps allows for better incident management. Queens Quay extension through Keating Precinct provides an east-west relief route to LSB. An incident on LSB would have less impact on travel speeds on LSB with the Queens Quay extension.	✓ <b>Preferred</b> - Ability to provide full shoulder on DVP-FGE ramps allows for better incident management. Queens Quay extension through Keating Precinct provides an east-west relief route to LSB. An incident on LSB would have less impact on travel speeds on LSB with the Queens Quay extension.
	A 5.3 Transport & Shipper Cost	Transport & Shipper Cost		✓ <b>Equally Preferred</b> - No noticeable difference in transport and shipper costs between the designs.	✓ <b>Equally Preferred</b> - No noticeable difference in transport and shipper costs between the designs.	✓ <b>Equally Preferred</b> - No noticeable difference in transport and shipper costs between the designs.
<b>Movement of Goods Summary Ranking</b>				● <b>MODERATELY PREFERRED</b>	✓ <b>PREFERRED</b>	✓ <b>PREFERRED</b>
A.6 Safety	A 6.1 Pedestrian Conflict Points	Risk Exposure for pedestrians: - road crossing length - presence of access ramps - presence of poor sight lines		● <b>Moderately Preferred</b> - Similar road crossing lengths for all alternatives. Introduction of FGE access ramp roads through Keating increases pedestrian risk exposure to access waterfront. Less flexibility to adjust FGE support structure to address poor sightlines.	✓ <b>Preferred</b> - Similar road crossing lengths for all alternatives. Less risk exposure to pedestrians with this ramp design. Greater flexibility with expressway support structure to provide good sightlines.	✓ <b>Preferred</b> - Similar road crossing lengths for all alternatives. Less risk exposure to pedestrians with this ramp design. Greater flexibility with expressway support structure to provide good sightlines.
	A 6.2 Cyclist Conflict Points	Potential for conflict points/safety concerns for crossing of Lake Shore Blvd. intersections		✓ <b>Equally Preferred</b> - All have similar ability to provide a safe east-west cycling facility.	✓ <b>Equally Preferred</b> - All have similar ability to provide a safe east-west cycling facility.	✓ <b>Equally Preferred</b> - All have similar ability to provide a safe east-west cycling facility.
	A 6.3 Motorist Conflict Points for at Grade Roadways	Potential conflict points/safety concerns at Lake Shore Blvd. intersections and access ramps		● <b>Moderately Preferred</b> - Potential sightline issues with east-bound exit ramp due to existing Gardiner support columns.	✓ <b>Preferred</b> - better sightlines when exiting the east-bound ramp.	✓ <b>Preferred</b> - better sightlines when exiting the east-bound ramp.
	A 6.4 Safety Risk for Motorists on Gardiner Expressway	Gardiner expressway/ramp geometry - level of safety to motorists		● <b>Moderately Preferred</b> - While existing DVP Gardiner Ramps have a higher design speed, they do not meet current standards due to lack of roadway shoulders and limited sight lines. Potential traffic weaving issues for EB traffic between Jarvis on-ramp and Cherry off-ramp. Potential sight line issues with new EB off-ramp due to expressway columns. Potential new WB on-ramp weaving issues with Sherbourne exit.	✓ <b>Preferred</b> - New DVP-Gardiner ramps include wider shoulders to improve sightlines. Possible that drivers might expect that they can operate their vehicle on approach to curved portion of DVP-Gardiner ramps at a higher speed than ramp design speed – signage and speed deceleration zones required. With appropriate mitigation, ramps can be designed to an acceptable level of safety.	✓ <b>Preferred</b> - New DVP-Gardiner ramps include wider shoulders to improve sightlines. Possible that drivers might expect that they can operate their vehicle on approach to curved portion of DVP-Gardiner ramps at a higher speed than ramp design speed – signage and speed deceleration zones required. With appropriate mitigation, ramps can be designed to an acceptable level of safety.
<b>Safety Summary Ranking</b>				● <b>MODERATELY PREFERRED</b>	✓ <b>PREFERRED</b>	✓ <b>PREFERRED</b>
A.7 Construction Impact	A 7.1 Duration & Extent of Construction Impact	Length of construction period and ability to stage construction to manage traffic flows and minimize delays		✓ <b>Preferred</b> - Approx. 4 years incl. 1 year pre-stage work – Overall shorter period than Hybrid 2 & 3. Majority of the realigned LSB can be constructed while maintaining current LSB. Traffic detours required utilizing Villiers Street and temporary widening of Don Roadway, for work at Logan Ramp, Don River Bridge, New FGE Ramps and DVP Bent relocation, incl. other restrictions. Potential least period of traffic detours (approx. 2 -3 years).	✗ <b>Less Preferred</b> - Approx. 5 years incl. 1 year pre-stage work – Overall longer than Hybrid 1. Majority of the realigned LSB can be constructed while maintaining current LSB. Traffic detours required utilizing Villiers Street and temporary widening of Don Roadway, for work at Logan Ramp, Don River Bridge, and New DVP-FGE Ramps, incl. other restrictions. Potential longest period of traffic detours for DVP-FGE ramp construction (approx. 3-4 years).	● <b>Moderately Preferred</b> - Approx. 5 years incl. 1 year pre-stage work – Overall longer than Hybrid 1. Majority of the realigned LSB can be constructed while maintaining current LSB. Traffic detours requirement same as Hybrid 2. Potential for shorter period of traffic detours than Hybrid 2 as existing ramps may remain open longer. Pre-stage highly challenging for the schedule for widening of rail underpass is subjected to Metrolinx requirements. Widening of rail underpass could provide roadway detour opportunities.
		Potential for traffic infiltration onto side streets		✓ <b>Preferred</b> - Construction may be completed while keeping some lanes of the expressway open during certain periods to accommodate through traffic and limit infiltration onto side streets.	● <b>Moderately Preferred</b> - Requires closing expressway use east of Cherry Street for a period which may result in traffic infiltration onto side streets.	● <b>Moderately Preferred</b> - Requires closing expressway use east of Cherry Street for a period which may result in traffic infiltration onto side streets.



**Table 5.2: Evaluation Matrix - Alternative Hybrid Designs**

Study Lens	Criteria Group	Criteria	Measures	Alternative Design 1	Alternative Design 2	Alternative Design 3
			Potential impact to pedestrian/ cycling infrastructure during construction	✓ <b>Equally Preferred</b> - East-west cycling passage can be equally accommodated with detours during construction.	✓ <b>Equally Preferred</b> - East-west cycling passage can be equally accommodated with detours during construction.	✓ <b>Equally Preferred</b> - East-west cycling passage can be equally accommodated with detours during construction.
	<b>A 7.3 Private Property</b>		Potential need for private property for construction staging/ detours	✓ <b>Preferred</b> - Use of existing Gardiner-Don Valley Parkway connection provides opportunity to limit use of private property for staging and detours.	⊘ <b>Moderately Preferred</b> - Replacement of Gardiner-Don Valley Parkway connection may require more private property for staging and detours than Hybrid 1.	⊘ <b>Moderately Preferred</b> - Replacement of Gardiner-Don Valley Parkway connection may require more private property for staging and detours than Hybrid 1.
			Potential property access disruption during construction	✓ <b>Preferred</b> - Use of existing Gardiner-Don Valley Parkway will result in less disruption to property access.	⊘ <b>Moderately Preferred</b> - Replacement of Gardiner-Don Valley Parkway connection will result in greater disruption to property access.	⊘ <b>Moderately Preferred</b> - Replacement of Gardiner-Don Valley Parkway connection will result in greater disruption to property access.
<b>Construction Impact Summary Ranking</b>				✓ <b>PREFERRED</b>	✗ <b>LESS PREFERRED</b>	⊘ <b>MODERATELY PREFERRED</b>
<b>OVERALL RATING: TRANSPORTATION &amp; INFRASTRUCTURE</b>				✗ <b>Less Preferred</b>	⊘ <b>Moderately Preferred</b>	✓ <b>Preferred</b>
<b>B. Urban Design</b>	<b>B.1 Planning</b>	<b>B 1.1 Consistency with Official Plans</b>	Consistency with approved Central Waterfront Secondary Plan principles: 1) <i>Removing Barriers</i> ; 2) <i>Building a Network of Spectacular Waterfront Parks and Public Spaces</i> ; 3) <i>Promoting a Clean and Green Environment</i> ; and 4) <i>Creating Dynamic and Diverse New Communities to support residential and employment growth along the Gardiner/ Lake Shore Blvd corridor</i>	⊘ <b>Moderately Preferred</b> - Minimally achieves the Central Waterfront Secondary Plan principles given physical constraints of using existing DVP - Gardiner ramp connections. Minimal opportunities for waterfront parks. Achieves implementation of continuous trail.	✓ <b>Preferred</b> - Contributes to achieving Central Waterfront Secondary Plan principles. Provides additional useable open space and public space. Improves north-south crossings. Achieves implementation of continuous trail.	✓ <b>Preferred</b> - Contributes to achieving Central Waterfront Secondary Plan principles. Provides additional useable open space and public space. Improves north-south crossings. Achieves implementation of continuous trail.
		<b>B 1.2 Consistency with Precinct Plans and Other Plans and Initiatives</b>	Impact on planned improvements to the Cherry St./Lake Shore Blvd. intersection and its ability to serve as a gateway to the Port Lands	⊘ <b>Moderately Preferred</b> - Consistent with physical plans but does not enhance opportunities at the Cherry/Lake Shore intersection. Widest intersection due to physical infrastructure of Gardiner Expressway.	✓ <b>Preferred</b> - Consistent with physical plans. New Gardiner support structure provides opportunity for improved intersection design. Provides a narrower intersection with opportunities for Port Lands gateway improvements.	✓ <b>Preferred</b> - Consistent with physical plans. New Gardiner support structure provides opportunity for improved intersection design. Provides a narrower intersection with opportunities for Port Lands gateway improvements.
			Impact on development phasing within Keating and the adjacent precincts	⊘ <b>Moderately Preferred</b> - Infrastructure does not enhance attractiveness of development parcels.	✓ <b>Preferred</b> - Parcels along Keating Channel become more attractive and thus more likely to be developed.	✓ <b>Preferred</b> - Parcels along Keating Channel become more attractive and thus more likely to be developed.
			Consistency with approved plans and facilities including: East Bayfront & Keating Precincts, Villiers Is., Port Lands, Don Mouth Naturalization (& Sediment Control Facility), South of Eastern & Port Lands TMP, and Cherry St. stormwater management facility	⊘ <b>Moderately Preferred</b> - Impacts potential to achieve consistent waterfront promenade along Keating Channel due to introduction of new Gardiner ramps east of Cherry Street; provides no new opportunities for enhancement.	✓ <b>Preferred</b> - Consistent with physical plans. Enhances Keating Precinct with improved development parcels and public space along waterfront. Improves views for Villiers Island and pedestrian experience along Keating Channel.	✓ <b>Preferred</b> - Consistent with physical plans. Enhances Keating Precinct with improved development parcels and public space along waterfront. Improves views for Villiers Island and pedestrian experience along Keating Channel.
<b>Planning Summary Ranking</b>				⊘ <b>Moderately Preferred</b>	✓ <b>Preferred</b>	✓ <b>Preferred</b>
	<b>B.2 Public Realm</b>	<b>B 2.1 Streetscape</b>	Quality of place along Lake Shore Boulevard, Queens Quay extension and within the Keating Precinct	✗ <b>Less Preferred</b> - Minimal improvements to Lake Shore Blvd intersections with removal of free turns and irregular road geometries; improved scale of fixtures, and improved quality of finishes. Does not achieve full extension of Queens Quay. Provides double-sided Lake Shore Blvd (development on both sides of the street) through Keating Precinct. Impacts ability to achieve pedestrian promenade along Keating Channel due to new Gardiner ramps east of Cherry Street.	⊘ <b>Moderately Preferred</b> - Some improvements to Lake Shore Blvd intersections with removal of free turns and irregular road geometries; improved scale of fixtures, and improved quality of finishes. Achieves full extension of Queens Quay. Provides double-sided Queens Quay with improved pedestrian scale for walkable vibrant streetscape. Achieves pedestrian promenade along Keating Channel.	✓ <b>Preferred</b> - Some improvements to Lake Shore Blvd intersections with removal of free turns and irregular road geometries; improved scale of fixtures, and improved quality of finishes. Achieves full extension of Queens Quay. Provides double-sided Queens Quay with improved pedestrian scale for walkable vibrant streetscape. Achieves pedestrian promenade along Keating Channel. Opens up Lake Shore Blvd between Munition Street and Don River by aligning the elevated structure further north.
			Ability to create attractive and consistent streetscapes in Keating Precinct	⊘ <b>Moderately Preferred</b> - Lake Shore Blvd through Keating Precinct pulled out from under Gardiner and opened to light and air. Double-sided development along LSB possible through Keating Precinct. However, Queens Quay extension through Keating is not possible.	✓ <b>Preferred</b> - Consolidated infrastructure with expressway above Lake Shore Blvd limits the potential for Lake Shore Blvd streetscape. However, extension of Queens Quay through Keating Precinct provides a new east-west spine that supports development with pedestrian scale streetscape and waterfront access along Keating Channel.	✓ <b>Preferred</b> - Consolidated infrastructure with expressway above Lake Shore Blvd limits the potential for Lake Shore Blvd streetscape. However, extension of Queens Quay through Keating Precinct provides a new east-west spine that supports development with pedestrian scale streetscape and waterfront access along Keating Channel.



**Table 5.2: Evaluation Matrix - Alternative Hybrid Designs**

Study Lens	Criteria Group	Criteria	Measures	Alternative Design 1	Alternative Design 2	Alternative Design 3
	<b>B 2.2 View Corridors</b>		Ability to create high-quality visual connections along roadways, among the Precincts, and to/from the water	<b>Less Preferred</b> - Moderate improvement along Lake Shore Blvd. Existing infrastructure reduces visual connections with elevated expressway along waterfront and crossing Don River. New ramps east of Cherry Street obstruct connections to Keating Channel.	<b>Moderately Preferred</b> - Visual connections along Queens Quay, to the waterfront and to Villiers Island greatly improved with northern alignment of elevated expressway. Queens Quay extension improves connection to East Bayfront Precinct. Minimal improvement along Lake Shore Blvd.	<b>Preferred</b> - Visual connections along Queens Quay, to the waterfront and to Villiers Island with northern alignment of elevated expressway. Queens Quay extension improves connection to East Bayfront Precinct. Improvement along Lake Shore Blvd with views to Don River.
			Ability to improve visual connection along the waterfront and over the Don River	<b>Less Preferred</b> - While some improvement of visibility with removal of Logan ramps, visual obstruction along Keating Channel remains from existing overhead expressway. New ramps at Cherry St. result in further visual screen of the waterfront from lands north of the Expressway.	<b>Moderately Preferred</b> - Removal of Logan ramps and relocation of elevated expressway to the north improves visual connection along the waterfront (Keating Channel) and over the mouth of the Don River.	<b>Preferred</b> - Removal of Logan ramps and relocation of elevated expressway further to the north even further improves visual connection along the waterfront (Keating Channel) and over the mouth of the Don River.
	<b>B 2.3 Public Realm</b>		Ability to create an attractive public realm in the Keating Precinct including pedestrian areas, patios, passive recreation, multi-use trails and streetscaping	<b>Moderately Preferred</b> - Minimal improvements along Lake Shore Blvd. Gardiner infrastructure along Keating Channel and crossing Don River limits public realm improvements.	<b>Preferred</b> - Extension of Queens Quay and removing infrastructure from Keating Channel provides ability to create attractive public realm with vibrant streetscape and recreational public spaces. Increased park space provides opportunity for programmable public space.	<b>Preferred</b> - Extension of Queens Quay and removing infrastructure from Keating Channel provides ability to create attractive public realm with vibrant streetscape and recreational public spaces. Increased park space provides opportunity for programmable public space.
			Ability to create an attractive pedestrian promenade with connection to the Keating Precinct (length (m) of unencumbered pedestrian water's edge promenade)	<b>Moderately Preferred</b> - Compromised pedestrian water's edge promenade by covered by elevated expressway through and light and air lost due to new ramps. 185m of unencumbered pedestrian waters edge promenade (between Don River and Cherry Street).	<b>Preferred</b> - Consistent attractive pedestrian promenade. 625m of unencumbered pedestrian water's edge promenade (between Don River and Cherry Street).	<b>Preferred</b> - Consistent attractive pedestrian promenade. 625m of unencumbered pedestrian water's edge promenade (between Don River and Cherry Street).
	<b>B 2.4 New Open Space</b>		Area and quality of open space land in the Keating Precinct that would be usable, complements the waterfront promenade and accommodates the cycling trail network	<b>Less Preferred</b> - Total open space of 1.9 ha. Waterfront promenade impacted by Gardiner infrastructure. Achieves cycling trail network.	<b>Preferred</b> - Total open space of 2.0 ha. Park land complements the waterfront promenade and achieves cycling trail network.	<b>Moderately Preferred</b> - Total open space of 1.7 ha. Open space north of Lake Shore Blvd compromised by new Gardiner infrastructure. Achieves waterfront promenade and cycling trail network.
<b>Public Realm Summary Ranking</b>				<b>Less Preferred</b>	<b>Moderately Preferred</b>	<b>Preferred</b>
<b>B.3 Built Form</b>	<b>B 3.1 Street Frontage</b>		Length of leasable, active, at-grade space along Lake Shore and Queens Quay that would support high quality development including retail	<b>Moderately Preferred</b> - 600 m of active street frontage along Lake Shore Blvd (both sides of the street) and 100 m along Queens Quay.	<b>Preferred</b> - 750 m of active street frontage along Queens Quay (both sides of the street); 600 m along Keating Channel; 160 m along Munition Street.	<b>Preferred</b> - 750 m of active street frontage along Queens Quay (both sides of the street); 600 m along Keating Channel; 160 m along Munition Street.
			Amount of above grade development that would be negatively impacted by proximity to elevated expressway structures	<b>Moderately Preferred</b> - 355 m of above-grade development along Lake Shore Blvd impacted by proximity to elevated expressway.	<b>Less Preferred</b> - 440 m of above-grade development along Lake Shore Blvd impacted by proximity to elevated expressway.	<b>Preferred</b> - 300 m of above-grade development along Lake Shore Blvd impacted by proximity to elevated expressway.
<b>Built Form Summary Ranking</b>				<b>LESS PREFERRED</b>	<b>MODERATELY PREFERRED</b>	<b>PREFERRED</b>
<b>OVERALL RATING: URBAN DESIGN</b>				<b>Less Preferred</b>	<b>Moderately Preferred</b>	<b>Preferred</b>



**Table 5.2: Evaluation Matrix - Alternative Hybrid Designs**

Study Lens	Criteria Group	Criteria	Measures	Alternative Design 1	Alternative Design 2	Alternative Design 3
C. Environment	C.1 Social & Health	C.1.1 Air Quality	Extent of change in regional air quality (NOx, VOC, & PM2.5).	✓ Equally Preferred - No noticeable difference in emissions among the alternative designs.	✓ Equally Preferred - No noticeable difference in emissions among the alternative designs.	✓ Equally Preferred - No noticeable difference in emissions among the alternative designs.
			Extent of change in local air quality (NOx, VOC, & PM2.5).	✓ Equally Preferred - No noticeable difference in emissions among the alternative designs.	✓ Equally Preferred - No noticeable difference in emissions among the alternative designs.	✓ Equally Preferred - No noticeable difference in emissions among the alternative designs.
			Level of Greenhouse Gas Emissions	✓ Equally Preferred - No noticeable difference in GHG emissions among the alternative designs.	✓ Equally Preferred - No noticeable difference in GHG emissions among the alternative designs.	✓ Equally Preferred - No noticeable difference in GHG emissions among the alternative designs.
		C.1.2 Noise	Extent of change in noise levels	● Moderately Preferred - Greater number of sensitive receptors in close proximity to Gardiner. There are no building shield effects that would reduce noise impacts from the Gardiner to sensitive receptors on Villiers Island.	✓ Preferred - Alignment of Gardiner is removed from Keating Channel so reduces noise impacts to Villiers Island. Building shield effects reduce noise impacts to development blocks on south side of Queens Quay adjacent to Keating Channel (blocks B, D and F). Building shield effects also reduce noise impacts to development units on the south side of blocks A, C, E and G.	✓ Preferred - Alignment of Gardiner is removed from Keating Channel so reduces noise impacts to Villiers Island. Building shield effects reduce noise impacts to development blocks on south side of Queens Quay adjacent to Keating Channel (blocks B, D and F). Building shield effects also reduce noise impacts to development units on the south side of blocks A, C, E and G.
		<b>Social &amp; Health Summary Ranking</b>				● MODERATELY PREFERRED
C.2 Natural Environment	C.2 Natural Environment	C.2.1 Terrestrial Environment	Potential to enhance/create terrestrial natural features	● Moderately Preferred - Minimal improvement through the Keating Precinct as the relocation of Lake Shore Blvd will allow for some planting and natural features along Lake Shore Blvd and the Keating Channel.	✓ Preferred - Relocation of Gardiner and Lake Shore Blvd, and the extension of Queens Quay, will allow for improved planting and natural features along Queens Quay and the Keating Channel. Provides opportunities for enhancement of the Don River with the reconstruction of the Gardiner-Don Valley Parkway connection.	✓ Preferred - Relocation of Gardiner and Lake Shore Blvd, and the extension of Queens Quay, will allow for improved planting and natural features along Queens Quay and the Keating Channel. Provides opportunities for enhancement of the Don River with the reconstruction of the Gardiner-Don Valley Parkway connection.
		C.2.2 Aquatic Environment	Potential to enhance/create aquatic habitat including Don River mouth revitalization initiative	● Moderately Preferred - Expressway is in close proximity to the Keating Channel and less opportunity for aquatic habitat improvement at Don River mouth.	✓ Preferred - Expressway is further removed from Keating Channel and new amp construction provides opportunity for greater flexibility to improve habitat at Don River mouth.	✓ Preferred - Expressway is further removed from Keating Channel and new amp construction provides opportunity for greater flexibility to improve habitat at Don River mouth.
		C.2.3 Water Quality	Proximity of roadway infrastructure to the Keating Channel and potential to impact water quality	● Moderately Preferred - Expressway is located on edge of Keating Channel and thus greater potential for storm water run-off effects.	✓ Preferred - Expressway is further removed from Keating Channel and new ramp construction provides greater opportunity for improvement to storm run-off management in a more sustainable manner.	✓ Preferred - Expressway is further removed from Keating Channel and new ramp construction provides greater opportunity for improvement to storm run-off management in a more sustainable manner.
		C.2.4 Water Quantity	Potential impact (including benefits) on Don River flood water conveyance and resilience to climate change effects	● Moderately Preferred - Can accommodate flood conveyance but less preferred for sediment management operations due to alignment of ramps that are closer to the mouth of the Don River.	● Moderately Preferred - Can accommodate flood conveyance but less preferred for sediment management operations due to alignment of ramps that are closer to the mouth of the Don River.	✓ Preferred - Can accommodate flood conveyance and preferred for sediment management operations due to northern alignment of ramps.
		C.2.5 Microclimate/Heat Island Effect	Ability of the road network to support tree canopy and other landscaping	✓ Equally Preferred - New Lake Shore Blvd alignment opens up opportunities for tree canopy through Keating Precinct.	✓ Equally Preferred - Queens Quay extension and portion of LSB provides opportunities for additional tree canopy through Keating Precinct. Relocation of Gardiner to the north allows for tree plantings along the north edge of Keating Channel.	✓ Equally Preferred - Queens Quay extension and fine grain street network provide opportunities for additional tree canopy through Keating Precinct.
		<b>Natural Environment Summary Ranking</b>				✗ Less Preferred





**Table 5.2: Evaluation Matrix - Alternative Hybrid Designs**

Study Lens	Criteria Group	Criteria	Measures	Alternative Design 1	Alternative Design 2	Alternative Design 3	
C.3 Cultural Resources	C.3.1 Built Heritage	C.3.1 Built Heritage	Direct impact on built heritage features	✓ <b>Equally Preferred:</b> Based on available documentation, no built heritage features within existing or proposed right-of-way.			
			C.3.2 Cultural Landscape	Direct impact on cultural landscapes	✓ <b>Equally Preferred:</b> Based on available documentation, no cultural landscapes within or adjacent to the existing or proposed right-of-way. Pending completion of a heritage assessment, the existing Gardiner Expressway corridor should be considered a potential cultural landscape.		
			C.3.3 Archaeology	Potential for impact on archaeological resources	✓ <b>Equally Preferred:</b> Based on completed Stage 1 Archaeological assessment, potential for effect on three archaeological features (Toronto Dry Dock, Toronto Iron Works, British American Oil).		
			C.3.4 First Nation People and Activities	Potential impact on lands used for traditional purposes	✓ <b>Equally Preferred:</b> Based on completed Stage 1 Archaeological assessment, no impact anticipated. Previous 19th and 20th century developments have removed features related to traditional uses of lands by Aboriginal peoples.		
<b>Cultural Resources Summary Ranking</b>				✓	<b>EQUALLY PREFERRED</b>		
<b>OVERALL RATING: ENVIRONMENT</b>				● <b>Moderately Preferred</b>	✓ <b>Preferred</b>	✓ <b>Preferred</b>	
D. Economics	D.1 Global & Regional Economics	D.1.1 Toronto's Global Competitiveness	Potential for change in Toronto's Global Competitiveness	✓ <b>Equally Preferred</b> – Considering the City's high global ranking and the minimal difference in travel times between the designs, none of the alternatives are expected to have an impact on the City's global economic competitiveness.			
			D.1.2 Regional Labour Force Access	Potential for change in Regional Labour Force Access to downtown	✓ <b>Equally Preferred</b> - Change to the regional attractiveness of downtown Toronto is not expected.		
			D.1.3 Mobility within Downtown	Potential for change in mobility within Downtown	✓ <b>Equally Preferred</b> - Relatively little difference among the alternatives in effects to mobility within the Downtown from the project.		
				Disruption During Construction	✓ <b>Preferred</b> - Minimal impact to Gardiner traffic with use of existing structure will result in the least impact to mobility and auto traffic elsewhere in the downtown.	● <b>Moderately Preferred</b> - Greater impact to Gardiner traffic during reconstruction of Gardiner-Don Valley Parkway connection over Don River. This will result in greater impact to mobility and auto traffic elsewhere in the downtown during the construction period.	● <b>Moderately Preferred</b> - Greater impact to Gardiner traffic during reconstruction of Gardiner-Don Valley Parkway connection over Don River. This will result in greater impact to mobility and auto traffic elsewhere in the downtown during the construction period.
D.1.4 Entertainment Venues	Potential for change in access and attractiveness to downtown entertainment venues	✓ <b>Equally Preferred</b> - The City's downtown venues are highly accessible by public transit. Further, there is typically minimal overlap with peak commuter travel times and travel to the entertainment venues. It is not expected that patrons who use the Gardiner Expressway to visit Downtown venues will face changes in travel times because of one design versus the other as the traffic travel times for the alternatives are similar.					
<b>Global and Regional Economics Summary Ranking</b>				✓ <b>Preferred</b>	● <b>Moderately Preferred</b>	● <b>Moderately Preferred</b>	
D.2 Local Economics	D.2.1 Business Activity	D.2.1 Business Activity	Number of potential new jobs in corridor and/or study area	✓ <b>Equally Preferred</b> - All options support similar levels of employment all support the First Gulf development that is projected to generate in excess of 25,000 new jobs.			
<b>Local Economics Summary Ranking</b>					✓ <b>EQUALLY PREFERRED</b>		
D.3 Direct Cost and Benefits	D.3.1 Capital Cost	D.3.1 Capital Cost	Total Hybrid capital cost (in 2013\$)	✓ <b>Preferred</b> - \$424million	● <b>Moderately Preferred</b> - \$526 million	✗ <b>Less preferred</b> - \$569 million	
			Property acquisition	✓ <b>Preferred</b> - None	● <b>Moderately Preferred</b> - Potential need for private property for construction detouring	✗ <b>Less Preferred</b> - Potential need for private property for construction detouring and for the DVP-Gardiner ramp connection along east side of the Don Roadway (First Gulf property).	
	D.3.2 Lifecycle Cost	D.3.2 Lifecycle Cost	NPV 100 year life cycle cost (includes total capital cost + 100yr operations and maintenance cost) *Figures are +/- 20%	✓ <b>Preferred</b> - \$339 million	● <b>Moderately Preferred</b> - \$414 million	✗ <b>Less preferred</b> - \$445 million	
	D.3.3 Public Land Value Creation	D.3.3 Public Land Value Creation	Public Land disposition proceeds in Keating and adjacent affected areas (e.g. Villiers Is.) that considers location and quality of the identified development blocks.	● <b>Moderately Preferred</b> - \$40 - \$50 million	✓ <b>Preferred</b> - \$70 to \$80 million	✓ <b>Preferred</b> - \$72 to \$83 million	
<b>Direct Cost and Benefit Summary Ranking</b>				✓ <b>Preferred</b>	● <b>Moderately Preferred</b>	✗ <b>Less Preferred</b>	
<b>OVERALL RATING: ECONOMICS</b>				✓ <b>PREFERRED</b>	● <b>MODERATELY PREFERRED</b>	✗ <b>LESS PREFERRED</b>	



### 5.5.5. Alternatives Comparison Summary – Keating Precinct Segment

**Table 5.3** presents a summary of the design alternatives rankings by the four study lenses. As presented in this table, Hybrid design alternative 3 is preferred for all lenses except Economics due to higher infrastructure capital costs.

All of the Hybrid design alternatives facilitate:

1. Revitalization of the Don River Mouth and Flood Protection project;
2. Development of the First Gulf site; and,
3. Implementation of new public transit projects through the waterfront/Port Lands.

However, there are differences in the benefits among the three Hybrid design alternatives, including:

1. **Hybrid Design Alternative 1 (south)** has a lower cost and the least complicated construction program with the least traffic disruption but would reintroduce roads along the north edge of the Keating Channel and limits public realm improvements in the Keating Channel Precinct.
2. **Hybrid Design Alternative 2 (mid)** provides an improved development pattern and pedestrian scale in the Keating Precinct, higher value development blocks than alternative 1, achieves the extension of Queens Quay East, opens up the Water's Edge Promenade along the Keating Channel, and provides opportunities for Don Mouth Naturalization enhancements.
3. **Hybrid Design Alternative 3 (north)** achieves everything that alternative 2 does but further improves on opening up the Don River Mouth with less potential to impact the Don Mouth sediment management activities, provides higher value to development blocks south of Lake Shore Boulevard, and opens up a greater section of Lake Shore Boulevard to light and air allowing for improved public realm. But these benefits are at a higher cost than alternatives 1 or 2.

Overall, Hybrid design alternatives 2 and 3 are more desirable than Hybrid 1 for Transportation, Urban Design and Environment and are therefore considered preferred. Considering the difference between Hybrid 2 and 3, alternative 3 is more desirable for Urban Design and Environment. However, alternative 3 is more expensive than alternative 2, with an additional capital cost of approximately \$31million NPV.

Comments and input received through public and stakeholder consultation, including online and in-person meetings, indicate a preference for Hybrid design alternative 3.

The additional cost of Hybrid 3 over Hybrid 2 can be justified by its additional benefits including less potential to impact the Don Mouth sediment management activities, provides higher value to development blocks south of Lake Shore Boulevard, and opens up a greater section of Lake Shore

Boulevard to light and air allowing for improved public realm. Considering these benefits, combined with its public support, alternative 3 is therefore recommended as preferred.

**Table 5.3: Summary of the Design Alternatives Evaluation**

		Preferred ✓	Moderately Preferred ●	Least Preferred ✕		
		CRITERIA GROUP	HYBRID 1	HYBRID 2	HYBRID 3	NOTES
Transportation & Infrastructure	Automobile	●	✓	✓	Hybrid 2 and Hybrid 3 preferred, allow for a better at-grade street network with extension of Queens Quay to Munition St.	
	Transit	●	✓	✓	Hybrid 2 and Hybrid 3 preferred, allow for possible extension of transit into Keating Precinct with Queens Quay extension.	
	Pedestrian	●	✓	✓	Hybrid 1 is less preferred as new Cherry St. ramps and access road inhibit pedestrian access to/from Keating Channel Promenade.	
	Cycling	✓	✓	✓	All allow for a new east-west off-road cycling track.	
	Movement of Goods	●	✓	✓	Preference for Hybrid 2 & Hybrid 3 as a result of less impact during traffic incidents.	
	Safety	●	✓	✓	Hybrid 1 is less preferred due to greater potential for cyclist/pedestrian conflict. While all alternatives have some less than standard road elements, they can be designed to an acceptable level of safety.	
	Construction Impacts	✓	✕	●	Preference for Hybrid 1 due to shorter construction period and less traffic detours/delays.	
Urban Design	Planning	●	✓	✓	Preference for Hybrid 2 and Hybrid 3 because of improved development opportunity in Keating Precinct.	
	Public Realm	✕	●	✓	Hybrid 1 is less preferred as access to the Keating Channel is compromised from ramps/access roads.	
	Built Form	✕	●	✓	Hybrid 3 has least amount of above grade development next to expressway.	
Environment	Social & Health	●	✓	✓	Less potential for noise effects to future receptors under Hybrid 2 & Hybrid 3.	
	Natural Environment	✕	●	✓	Hybrid 3 preferred as would have least impact on planned Don Mouth Rehabilitation.	
	Cultural Resources	✓	✓	✓	All alternatives have similar impact.	
Economics	Global Regional Economics	✓	●	●	Slight preference for Hybrid 1 as less impact on trucks during construction. No long term effects.	
	Local Economics	✓	✓	✓	All options support new economic growth/downtown economy.	
	Fiscal Net Benefits	✓	●	✕	Hybrid 1 preferred because of least overall cost.	



## **6. CORRIDOR DESIGN WEST OF CHERRY AND EAST OF DON ROADWAY**

This chapter presents public realm improvements that would be common to all three Hybrid alternative designs in Segment 1 - Jarvis Street to Cherry Street and in Segment 3 - Don Roadway to Logan Avenue. The plans for public realm improvements for Segment 1 from Jarvis Street to Cherry Street are presented below in Section 6.2. Section 6.3 presents the planned public realm improvements for Segment 3 which complement the planned removal of the Logan ramps and the rebuilding of Lake Shore Boulevard (which is included as part of the overall preferred Hybrid Alternative Solution).

Alternative designs were not generated for the western and eastern segments of the corridor. For the western segment (Jarvis Street to Cherry Street), through the alternative solutions phase of the EA study, it was determined that there would be no significant infrastructure changes west of Cherry Street. In June 2015, City Council recommended that the western segment of the Gardiner-Lake Shore Boulevard corridor be maintained with the full traffic function that exists today (retaining the same number of roadway lanes and ramps). As such, design interventions for this segment focus on public realm and intersection improvements to complement and improve existing roadway infrastructure. These changes do not require EA approval.

The proposed design for the eastern segment of the study area, east of the Don Roadway, is based on the Recommend Alternative Solution that was approved by City Council in June 2015 which includes the removal of the eastern end of the Gardiner ramps that extend from the Don Roadway to Logan Avenue (known as the Logan Ramps). With this preferred alternative solution a new rebuilt Lake Shore Boulevard is proposed within the same road right-of-way. This rebuilt boulevard would connect with the existing Lake Shore Boulevard east of Logan Avenue. Lake Shore Boulevard is a six-lane boulevard from just east of Logan Ave to Leslie Street. And to the west, the rebuilt roadway would connect with the proposed realigned Lakeshore Boulevard at the current Don River bridge location (also a six-lane roadway). Considering the need to connect with other sections of Lake Shore Boulevard and traffic demand requirements, no reasonable alternative roadway designs were identified for this segment.

It is important to note that this eastern segment of the study area passes through a part of the City that is undergoing extensive planning, transportation and urban design study. The plans for the neighbourhoods on either side of Lake Shore Boulevard in this stretch (Port Lands and South of Eastern) are still being confirmed and will influence the design of Lake Shore Boulevard. This includes the potential for new north-south street intersections and cycling connections. This EA study has included, where possible, consideration for these other plans and the design allows for some flexibility to accommodate future modifications if needed.

There are elements of the design plans that extend throughout the study corridor. These include pedestrian and cycling network connections, public realm improvements and open space concepts. Prior to describing the specific design plans in the western and eastern segments of the study area,

Section 6.1 explains the common design elements that extend throughout the study corridor from approximately Jarvis Street to Logan Avenue.

## 6.1. Corridor-Wide Design Elements

Common elements of the design plans throughout the corridor include a continuous and connected pedestrian and cycling network, a continuous network of open spaces and public realm improvements through hard and soft landscaping, public art and animation.

## 6.2. Pedestrian Network and Cycling Connections

Extending the length of the study area is a proposed new multi-use trail. The trail would be located along the north edge of Lake Shore Boulevard. **Figure 6.1** presents the location of the new multi-use trail and the connections that this will make with other existing and future cycling routes, pedestrian paths, and multi-use trails.

The pedestrian network will also be enhanced through the implementation of continuous sidewalks along the north and south sides of Lake Shore Boulevard, where possible. Improved pedestrian connections will enhance connectivity throughout the Central Waterfront and between the planned precincts.

**Figure 6.2** illustrates what the multi-use trail could look like in the western section of the study area between Jarvis Street and Cherry Street. One of the core considerations for improvements to the public realm is to open up views and vistas to the waterfront and major landmarks throughout the corridor, such as the CN Tower.



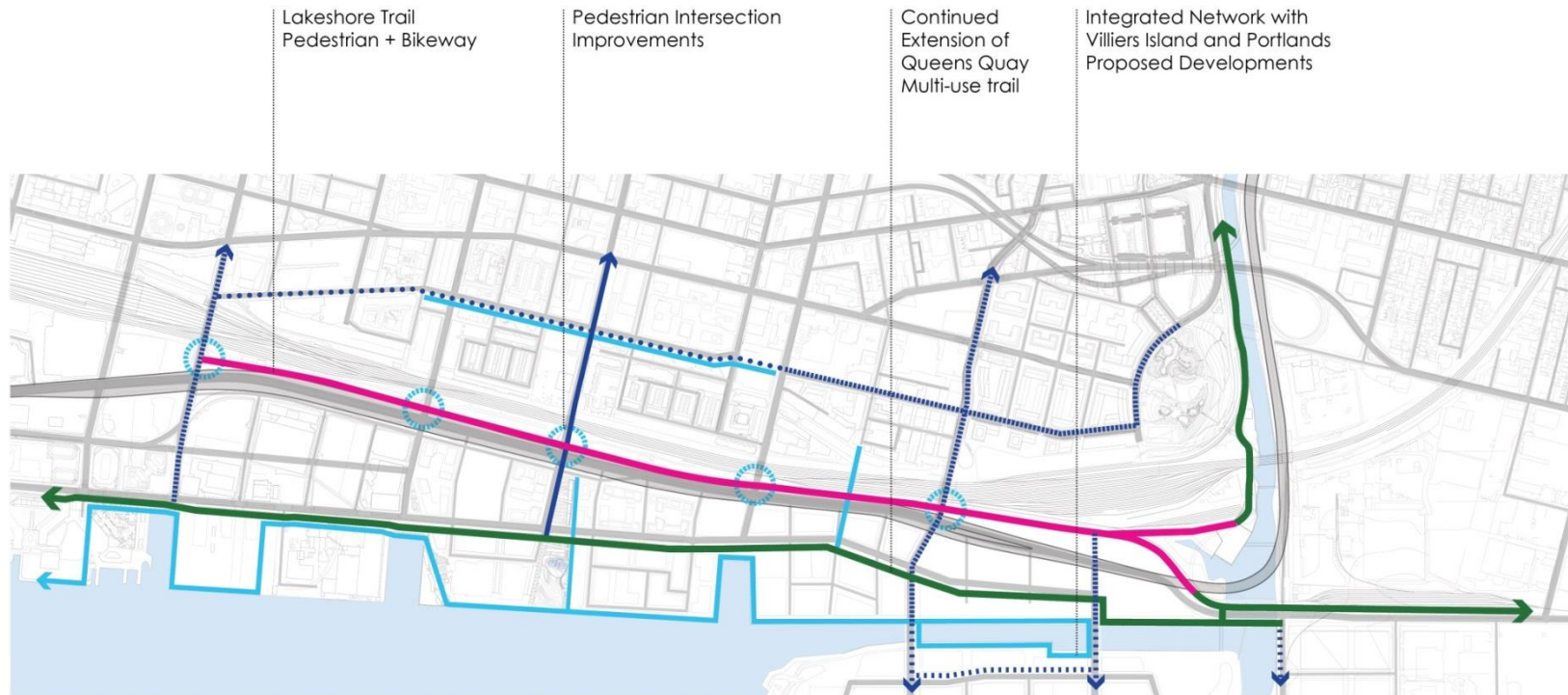
Figure 6.1: Proposed Pedestrian and Cycling Network

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## PEDESTRIAN + BIKE

PROPOSED NETWORK

NOTE: Proposed Keating Channel Precinct Illustrated as Hybrid Alternative 2



**Figure 6.2: Lake Shore Boulevard Conceptual Pedestrian and Multi-Use Trail Rendering**

(east of Sherbourne Street looking west)



### 6.3. Open Space

A conceptual system of new open space is proposed along the north edge of Lake Shore Boulevard for the entire extent of the study corridor. **Figure 6.3** presents the open space concept. The open space between Jarvis Street and Cherry Street would be integrated with the proposed multi-use pathway.

The open spaces along Lake Shore Boulevard would include passive spaces to provide an improved balance of green space among the road infrastructure and enhance the pedestrian experience.

### 6.4. Public Realm, Public Art and Animation

There are many public realm design interventions that can be applied throughout the study area that do not require infrastructure changes. These include landscaping, public art installations and animation of the existing public realm and open spaces with temporary market space, pedestrian squares, light, and art installations. Some examples of these are provided in **Figure 6.4**.






**Figure 6.3: Conceptual Open Space System**

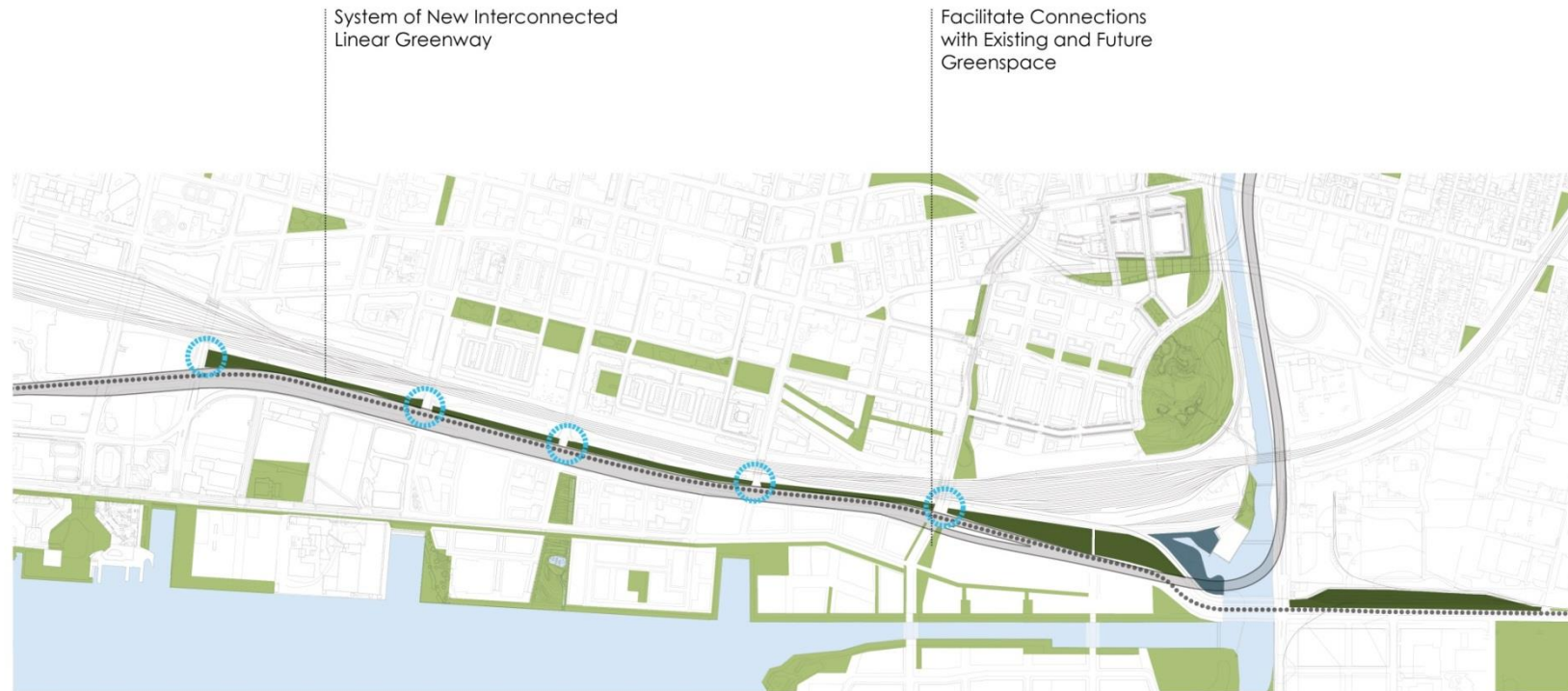
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## OPENSOURCE

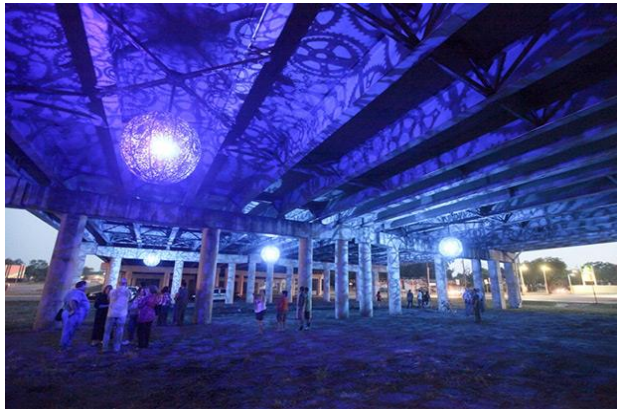
PROPOSED SYSTEM

NOTE: Proposed Keating Channel Precinct Illustrated as Hybrid Alternative 2

- PUBLIC OPENSOURCE 
- DON RIVER NATURALIZATION AREA 
- LAKESHORE BOULEVARD 
- LAKESHORE TRAIL GREENWAY 
- KEY CONNECTIONS 



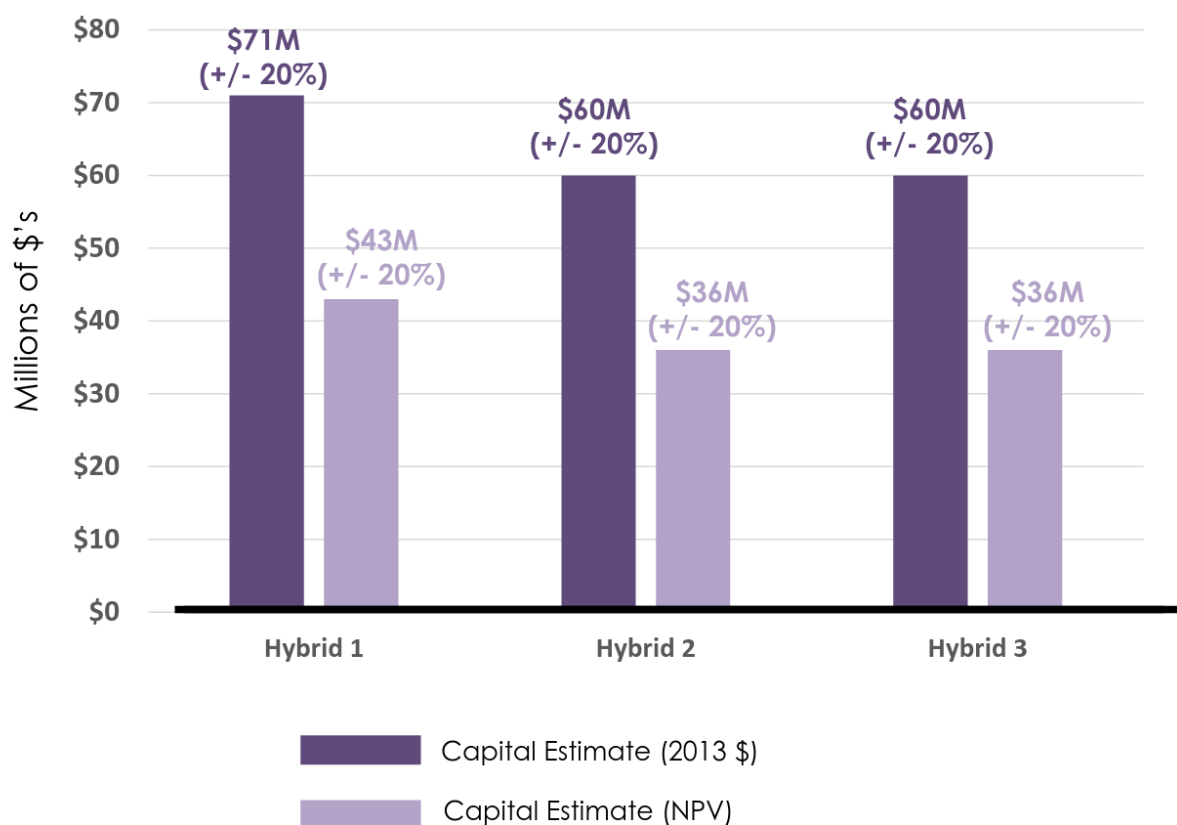
**Figure 6.4: Public Art and Animation Opportunities**



## 6.5. Public Realm Costs

Public realm design costs to implement the proposed hard and soft landscaping improvements for the entire study corridor from Jarvis Street to Logan Avenue were estimated in 2013\$ and NPV. For the Keating Precinct, the public realm costs vary among the three Hybrid alternatives. All three cost estimates shown in **Figure 6.5** include the same approximate cost for the segments west of Cherry Street and east of the Don Roadway. Design alternative 1 would result in the highest estimated public realm cost of \$71 million (2013\$) (\$43 million NPV). This is due to the higher cost to develop the Water's Edge Promenade underneath the Gardiner structure along the north edge of the Keating Channel. With the structure relocated away from the Keating Channel, the cost to implement the Water's Edge Promenade is reduced. As such, design alternatives 2 and 3 have estimated public realm costs of \$60 million (2013\$) (\$36 million NPV).

**Figure 6.5: Corridor Wide Public Realm Costs (Jarvis Street to Logan Avenue)**



<sup>1</sup> All costs are high level order of magnitude prepared for comparative purposes only.

## 6.6. Design Plan for Jarvis Street to Cherry Street

This section outlines the design interventions proposed for the western segment of the study area, extending from just west of Jarvis Street to Cherry Street. The design interventions proposed do not include infrastructure changes to the Gardiner Expressway structure (including the ramps). They focus on:

- Physical intersection improvements (removing excess turning islands and regularizing intersections);
- Improving intersection legibility (understandable traffic movements for turns and through traffic);
- De-cluttering the intersections (addressing excess signage);
- Improved paving materials to differentiate pedestrian, cycling and automobile spaces;
- Opportunities for enhancing the underside of the Gardiner structure with public art to improve the pedestrian experience; and,
- Connecting cycling facilities and pedestrian crossings.

### 6.6.1. Lower Jarvis Street Intersection

The improvements proposed for the Lower Jarvis Street and Lake Shore Boulevard intersection are illustrated in **Figure 6.6**. These include:

- Regularizing the eastbound lanes of Lake Shore Boulevard on the west side of Jarvis Street which reduces the crossing distance of these lanes. By designing the lane configuration to reflect a more standard or typical intersection, this also improves the legibility of the intersection movements for drivers;
- Reducing the turning radius of the westbound Lake Shore Boulevard right hand turn lane onto Jarvis Street (northbound);
- Provide texture to road surface to demark pedestrian crossing area;
- Implementing north-south curb enlargements which will allow for bike lanes to be incorporated;
- Increasing the setback of intersection stop lines to support safe pedestrian crossings; and,
- Implementing hard and soft landscaping along Lake Shore Boulevard to improve the pedestrian experience.

**Figure 6.7** illustrates a conceptual example of what the proposed improvements for this intersection could look like.

Figure 6.6: Proposed Lower Jarvis Street and Lake Shore Boulevard Intersection Design

