

GARDINER EXPRESSWAY AND LAKE SHORE BOULEVARD EAST RECONFIGURATION

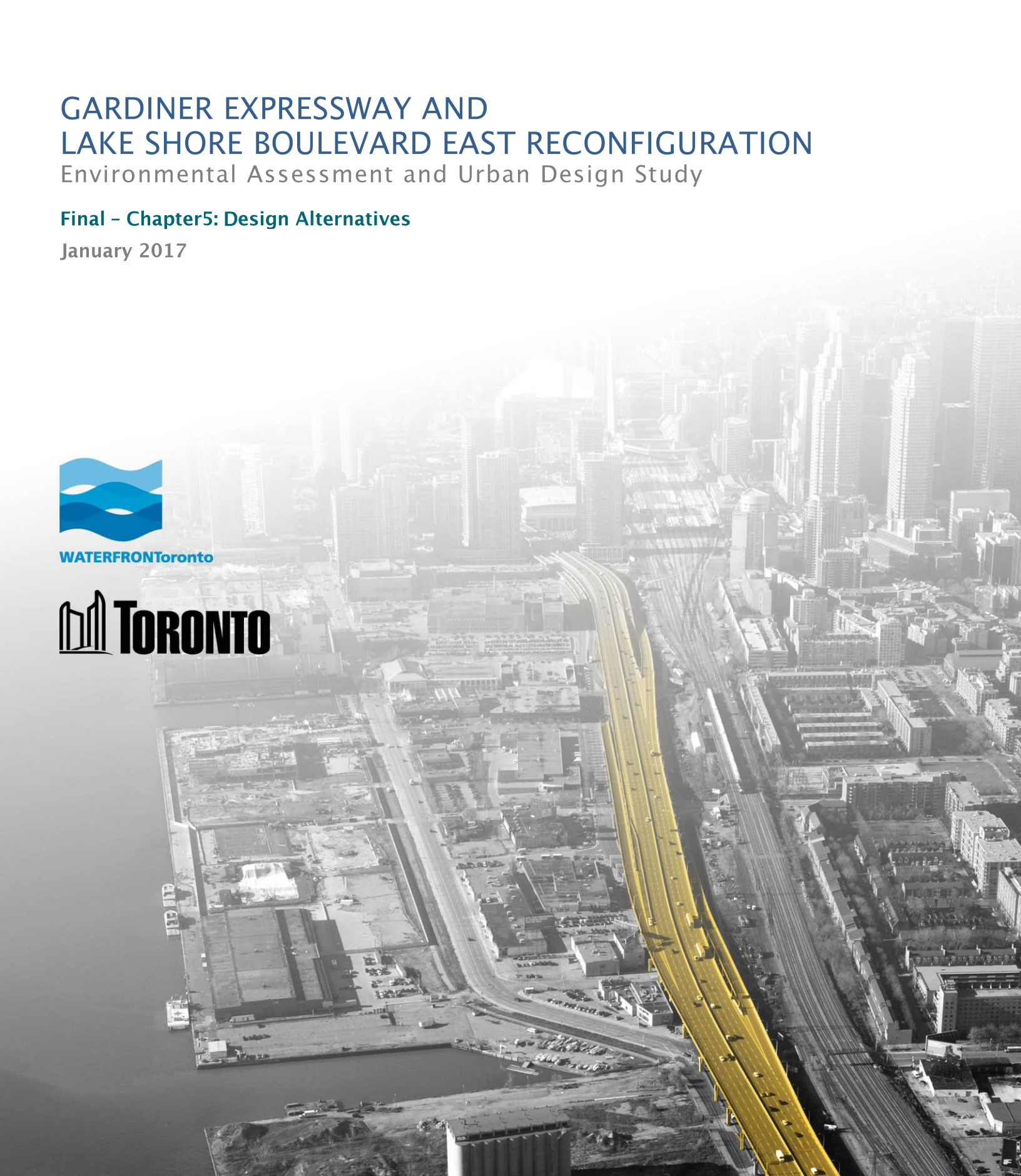
Environmental Assessment and Urban Design Study

Final – Chapter 5: Design Alternatives

January 2017



WATERFRONToronto



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5.0 Design Alternatives

This chapter describes and evaluates the alternative designs for the preferred Hybrid Solution to determine a preferred design. Described are the stakeholder and public influences in the development of the alternative designs, the three design alternatives that were developed and the assessment and evaluation of these alternatives.

It is noted that after City Council had endorsed the Hybrid as the preferred alternative solution in June 2015, during the period of alternative design development and assessment, unsolicited alternative solution proposals were presented by third-party teams. In September 2015, PWIC directed the project team to further develop and assess these alternatives in parallel with the development and assessment of the Hybrid alternative designs. And while the project team did not recommend the further consideration of these third-party proposals in this EA study, these concepts did help inform the development of the Hybrid alternatives. **Appendix R** documents the results of the assessment of these alternatives.

5.1 Alternative Designs Corridor Segments Overview

As shown in **Figure 5-1**, 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.

Outside of corridor-wide considerations, such as Urban Design, the following presents the corridor changes that were considered within each segment.

5.1.1 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. For all alternative designs, key intersections were assessed for potential improvements. 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 5-1: Study Segments of Gardiner-Lake Shore Boulevard Corridor (Hybrid 1)



5.1.2 Segment 2 - Cherry Street to the Don Roadway

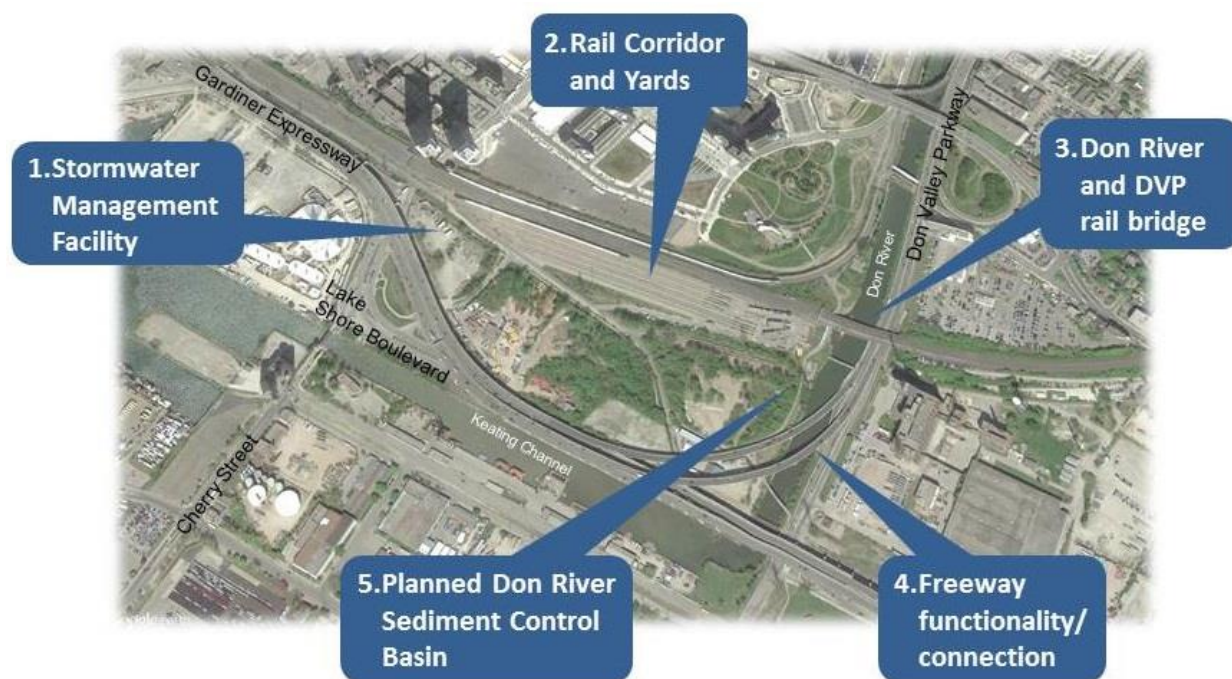
In this segment (through the Keating Channel Precinct) design alternatives have been developed and were considered in this EA. With the removal of the eastern end of the Gardiner, east of the Don Roadway (see Segment 3), the opportunity arises to rebuild the expressway connection between the Don Valley 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 Channel Precinct between Cherry Street and the Don Roadway and three Hybrid design alternatives were developed and considered for this segment.

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

1. The presence of the City's new stormwater management shaft and proposed 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 5-2 highlights the location of these key considerations influencing the design alternatives. The Hybrid design alternatives were prepared with these considerations in mind and are described in **Section 5.2** further below.

Figure 5-2: Key Infrastructure Considerations Influencing Design Alternatives



5.1.3 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. 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.

All the examined Hybrid alternatives include these changes east of the Don River. 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 6.2**).

5.2 Alternative Hybrid Designs

The Hybrid design alternatives that were considered, developed and evaluated in Segment 2 (traversing the Keating Channel 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), 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 Channel Precinct Plan that is to be undertaken by the City and Waterfront Toronto following Gardiner East EA approval by the MOECC.

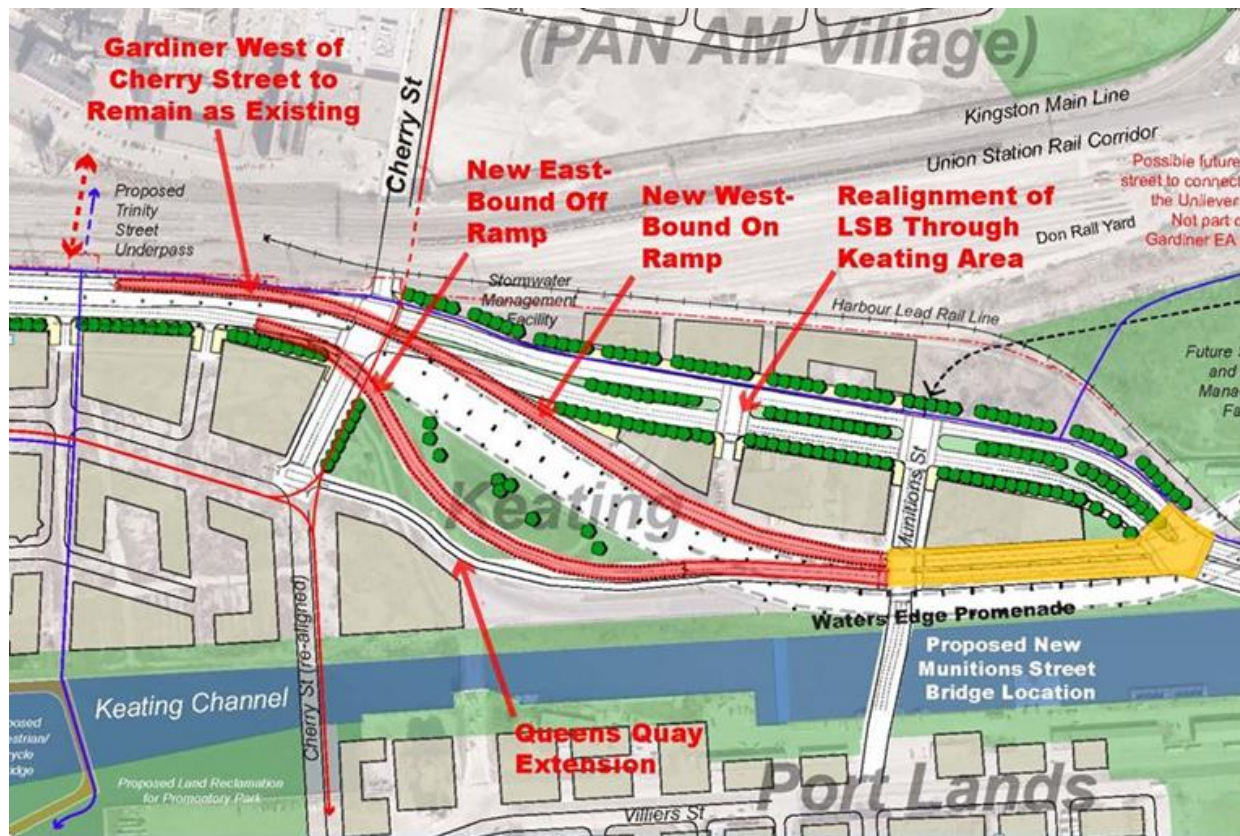
5.2.1 Hybrid Designs Not Carried Forward

The three Hybrid alternative design concepts that will undergo full EA evaluation were selected from a broader list of concepts. These concepts were developed by the Gardiner East EA project team, and were influenced by proposals submitted to the team from community members, planners and landowners. Following public and stakeholder input, and an analysis of key issues and constraints, the following six Hybrid alternative design concepts are not being carried forward in the EA process for detailed design work, costing and assessment. They include:

- Council-Reviewed Hybrid of June 2015;
- Hybrid with Westbound On-Ramp Only;
- Realigned Hybrid with 70km/h Design Speed;
- Hybrid over Stormwater Facility with 60km/h Design Speed;
- 15-metre Rail Flyover; and
- 15-metre Rail Flyover Without on/off Ramps.

Council Reviewed Hybrid

This Hybrid alternative concept, reviewed by Council in June 2015, included new eastbound and westbound on/off ramps in the Keating Channel Precinct to replace the Logan on/off ramps. The eastbound off-ramp in this concept would swing south of the Gardiner. Members of the public and landowners expressed concern with this ramp due to its impact on private property, as well as Keating Channel Precinct public realm opportunities. To avoid these impacts, the revised designs of the Hybrid alternatives all included an eastbound off-ramp that is located "tighter" to the elevated structure.

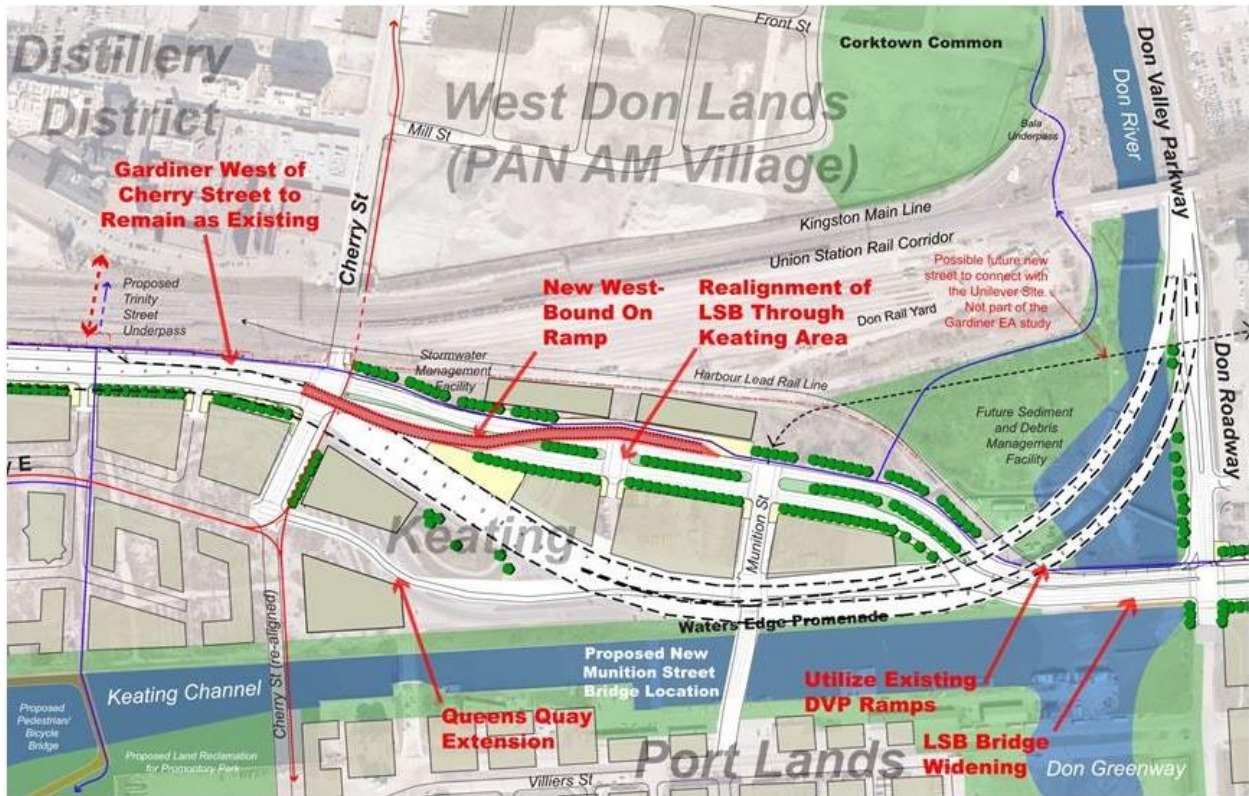


Council reviewed Hybrid – not carried forward.

Hybrid with Westbound On-Ramp Only

To minimize the impact of new on/off ramps on the Keating Channel Precinct, a Hybrid concept with a westbound on-ramp only at Cherry Street was explored. For this concept, the westbound on-ramp was redesigned to feature a ramp with access from the north side of Lake Shore Boulevard, which would cross over Lake Shore to connect with the Gardiner above Cherry Street. With the proposed Lower Yonge Precinct Plan road network changes in place, the length of travel along Lake Shore Boulevard would increase over current conditions as the Jarvis off-ramp is to be shortened to west of Yonge Street. The absence of an eastbound off-ramp in the

Keating Channel Precinct area would force vehicles headed east of the Don Roadway to stay on Lake Shore Boulevard or find alternate paths along other heavily trafficked east-west roadways. Based on the traffic modelling that was completed for the 2031 horizon year, PM peak hour auto travel time for eastbound commuters could be expected to increase in the range of two to four minutes. This ramp configuration would also greatly reduce the utility of the Gardiner in the downtown area by removing a connection that provides important relief to eastbound Lake Shore Boulevard, primarily during the PM peak hour. For this reason, a Hybrid concept that does not provide new Gardiner on and off ramps was not considered further.



Hybrid with westbound on-ramp only – not carried forward.

Realigned Hybrid with 70km/h Design Speed

A Hybrid with a 70 km/h Gardiner–DVP ramp design speed was developed. The alignment for a ramp at this speed would place the ramp in a similar location as the existing Gardiner–DVP ramps, close to the Keating Channel. As there would be little benefit in incurring significant costs to rebuild a new ramp in virtually the same location as the existing ramps, this concept was not considered further.



Hybrid ramp design with 70 km/hr design speed.

Hybrid over Stormwater Facility with 60km/h Design Speed

In an effort to move roadway infrastructure as far north as possible from the Keating Channel, a Hybrid design was considered in which the expressway would pass over the new West Don Lands Storm Water Management (SWM) facility just east of Cherry Street. There are; however, several issues with this concept:

- While the elevated expressway could potentially span over the SWM facility, the at-grade Lake Shore Boulevard would still run south of it. The continuation of this parallel versus a stacked – roadway configuration would mean a larger overall roadway “footprint” in the Keating Channel Precinct;
- Spanning of the SWM facility would have higher capital costs as a result of both longer spans between structure supports, and the removal of a longer portion of the Gardiner west of Cherry Street to align the new elevated expressway with the existing Gardiner;
- A parallel Gardiner/Lake Shore Boulevard configuration would result in a more complex road and ramp arrangement needed to provide on/off access to the expressway. A stacked configuration would better facilitate new on/off ramps in the corridor;



Hybrid ramp design over stormwater facility with 60 km/hr design speed.

- Due to insufficient vertical clearance, spanning of the expressway over the SWM facility would require relocation of the westbound on-ramp to east of the SWM facility. This would complicate the design of the realigned Lake Shore Boulevard, including intersection locations, through the Keating Channel Precinct;
- Reducing the height of the SWM facility to approximately eight metres from the current 13 metres would result in the need to redesign and tender the building project; and
- Spanning of the expressway over the SWM facility could result in impacts and/or restrictions on maintenance activities for both the new expressway and the SWM facility.

A northern expressway alignment may be achieved with design concepts that do not involve the overhead spanning of the SWM facility and all its associated challenges. For these reasons, design concepts that overtop the SWM facility were not considered further.

Hybrid with a 15 metre Rail Flyover

To overcome the constraint of the Metrolinx rail bridge over the Don River in achieving a more northern alignment for the expressway through the Keating Channel Precinct, a Hybrid concept that involves an overpass over the rail bridge was explored. This ramp configuration would start along the DVP just south of Eastern Avenue with a minimum 7.4-metre clearance over the rail tracks, resulting in an approximately 9–10 metre high ramp over the rail tracks.



Hybrid with 15 metre rail flyover.

Construction of this concept would be complex and costly. The need for ramp support structures and fill close to the Don River could have impacts on flood water conveyance. Further, the need for a vertically high ramp (to meet rail track clearance requirements) could have negative impacts on adjacent land uses, including Corktown Common. It was determined that the benefits of the higher ramp design speed of this northerly alignment could be largely achieved through an expansion of the Metrolinx rail bridge underpass. As a result, this concept was not considered further.

Hybrid with a 15-metre Rail Flyover Without on/off Ramps



15 metre rail flyover without on/off ramps

This Hybrid concept would overpass the Metrolinx rail bridge to achieve an even more northern alignment than Concept 4 above. However, it would achieve this by overtopping the planned stormwater management facility at the cost of the on/off ramps to the Gardiner. Traffic modelling results confirm that both Gardiner on/off ramps are required to avoid significant travel time impacts. Thus, the benefits of the higher ramp design speed of this northernmost alignment do not outweigh the many impacts. Its benefits can be largely achieved through an expansion of the Metrolinx rail bridge underpass. Consequently, this concept was not considered further.

5.2.2 Hybrid Designs Considered

Considering the study area constraints and the input received from the public and various stakeholders, three Hybrid alternative designs were developed and carried forward into an evaluation.

All three Hybrid alternative designs build upon the Hybrid Preferred Solution endorsed by Toronto City Council in June 2015. In particular, all three Hybrid designs include:

- Preservation of continuous Gardiner–DVP freeway linkage, with nominal to zero impact on road capacity and travel times;
- Removal of the existing Logan on/off ramps and a replacement of these access ramps with new ramps to be placed in the Keating Channel Precinct;
- Re-alignment of Lake Shore Boulevard through the Keating Channel Precinct;
- Full compatibility with planned rehabilitation of the elevated Gardiner Expressway west of Cherry Street; and
- The extension of a multi-use pathway along the north side of Lake Shore Boulevard that connect with a planned new pathway east of Cherry Street and the existing pathways that runs up the Don Valley and east of the Don River.

The key design elements of each of the three Hybrid alternatives (Hybrids 1, 2 and 3) are described below. **Figures 5–3** through **5–5** present the three Hybrid design alternatives in the Keating Channel Precinct, between Cherry Street and the Don Roadway / DVP. **Figure 5–6** presents a comparison of the three Hybrid alignments and **Figure 5–7** presents renderings of the Hybrids showing their alignments over the Don River with full build out of the Keating Channel Precinct. These renderings include potential public realm improvements for all of the 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 Channel 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 Channel 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 Channel 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 with a lowered speed limit;
- 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 Munition Street extension; and,
- Construct a new Lake Shore Boulevard alignment that runs mid-block through the Keating Channel 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 Channel 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 with a lowered speed limit;
- 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 Channel Precinct.

Lake Shore Boulevard Alignments

The proposed mid-Keating Channel 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 Channel 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 Lake Shore Boulevard 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 Lake Shore Boulevard alignment, the Lake Shore Boulevard/Don Roadway intersection would require a skewed intersection design which is not ideal. As a result, this alternative Lake Shore Boulevard alignment was not explored further in the EA study.

Figure 5-3: Hybrid Design Alternative 1 (South) – Keating Channel Precinct

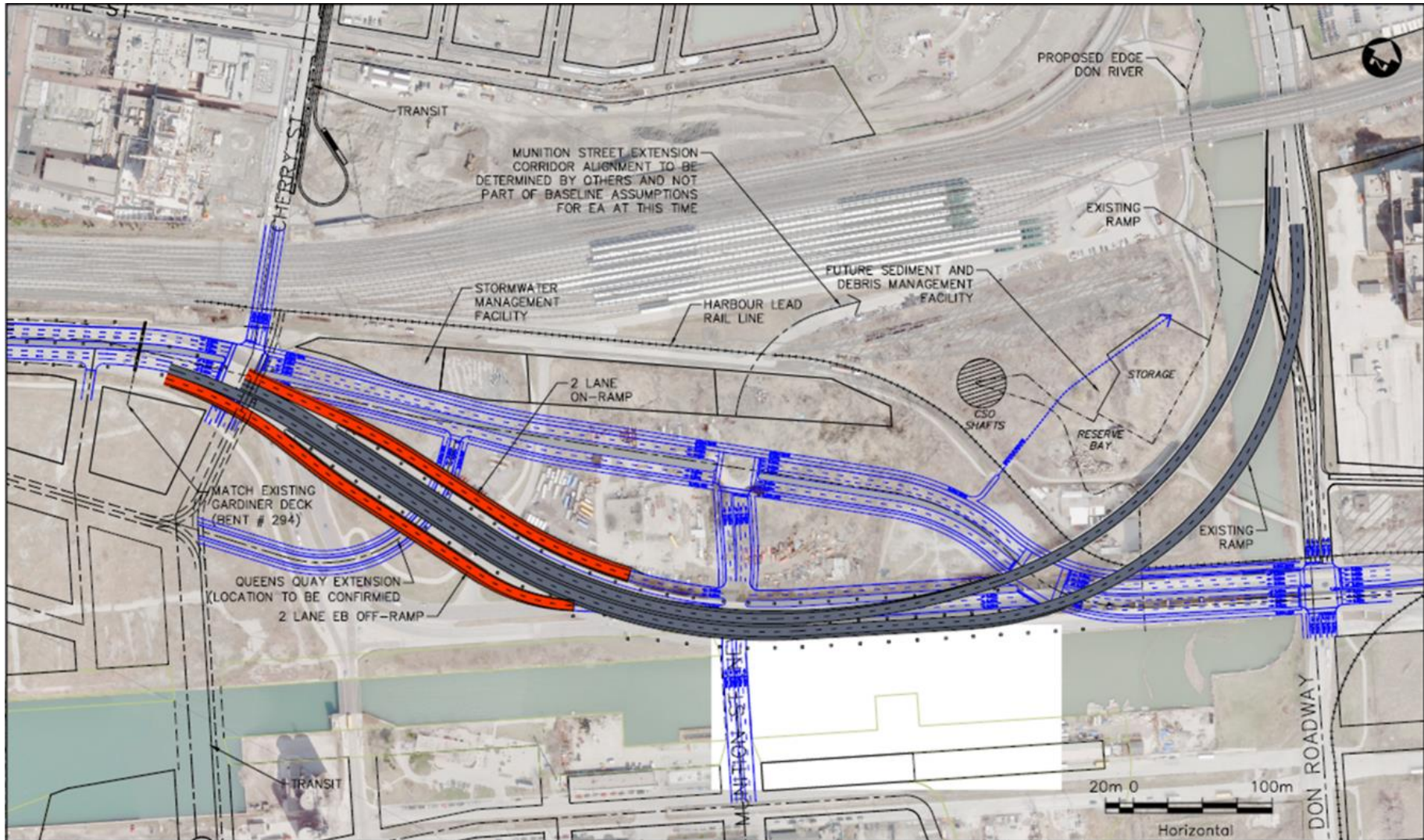


Figure 5-4: Hybrid Design Alternative 2 (Mid) – Keating Channel Precinct

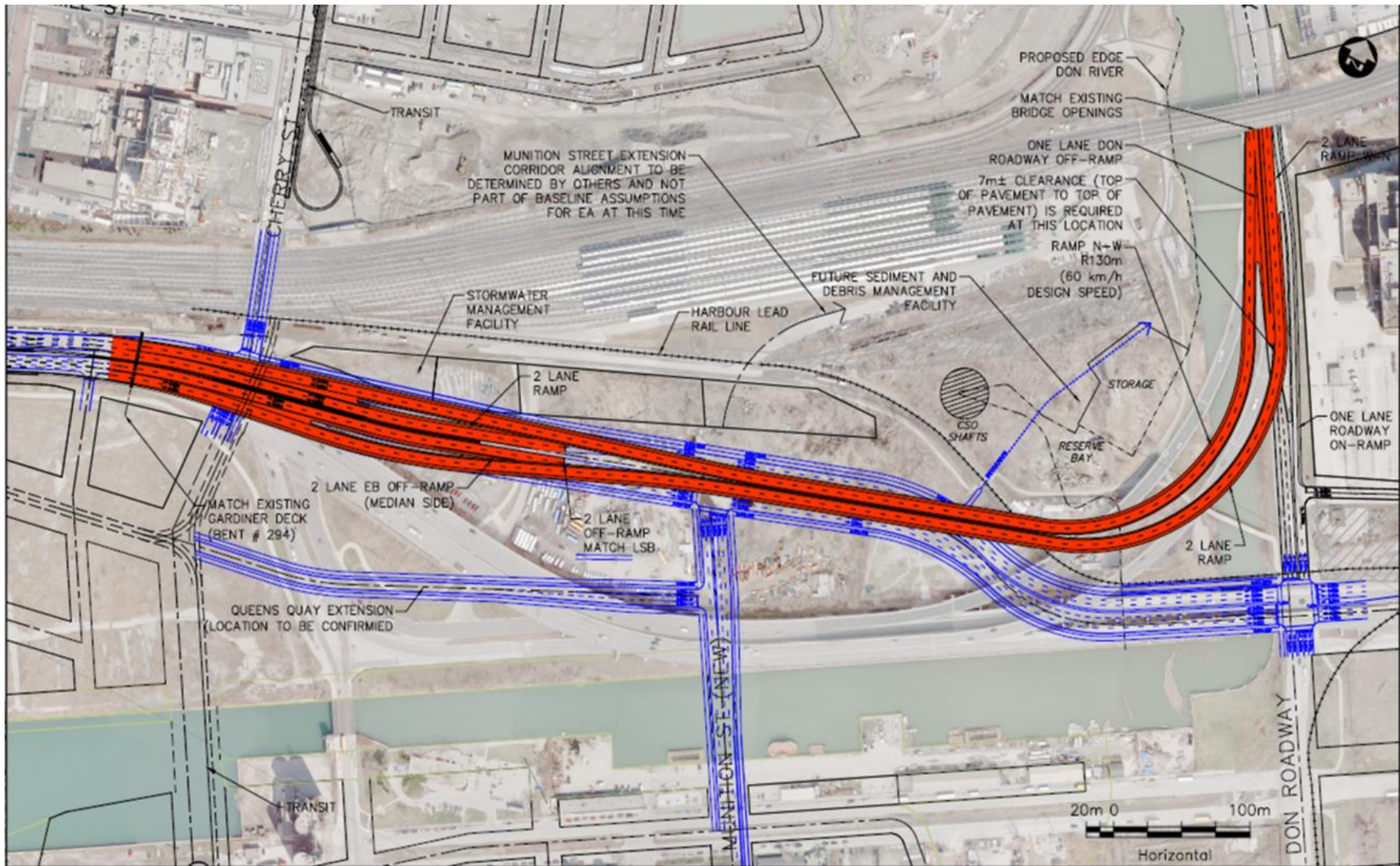


Figure 5-5: Hybrid Design Alternative 3 (North) - Keating Channel Precinct

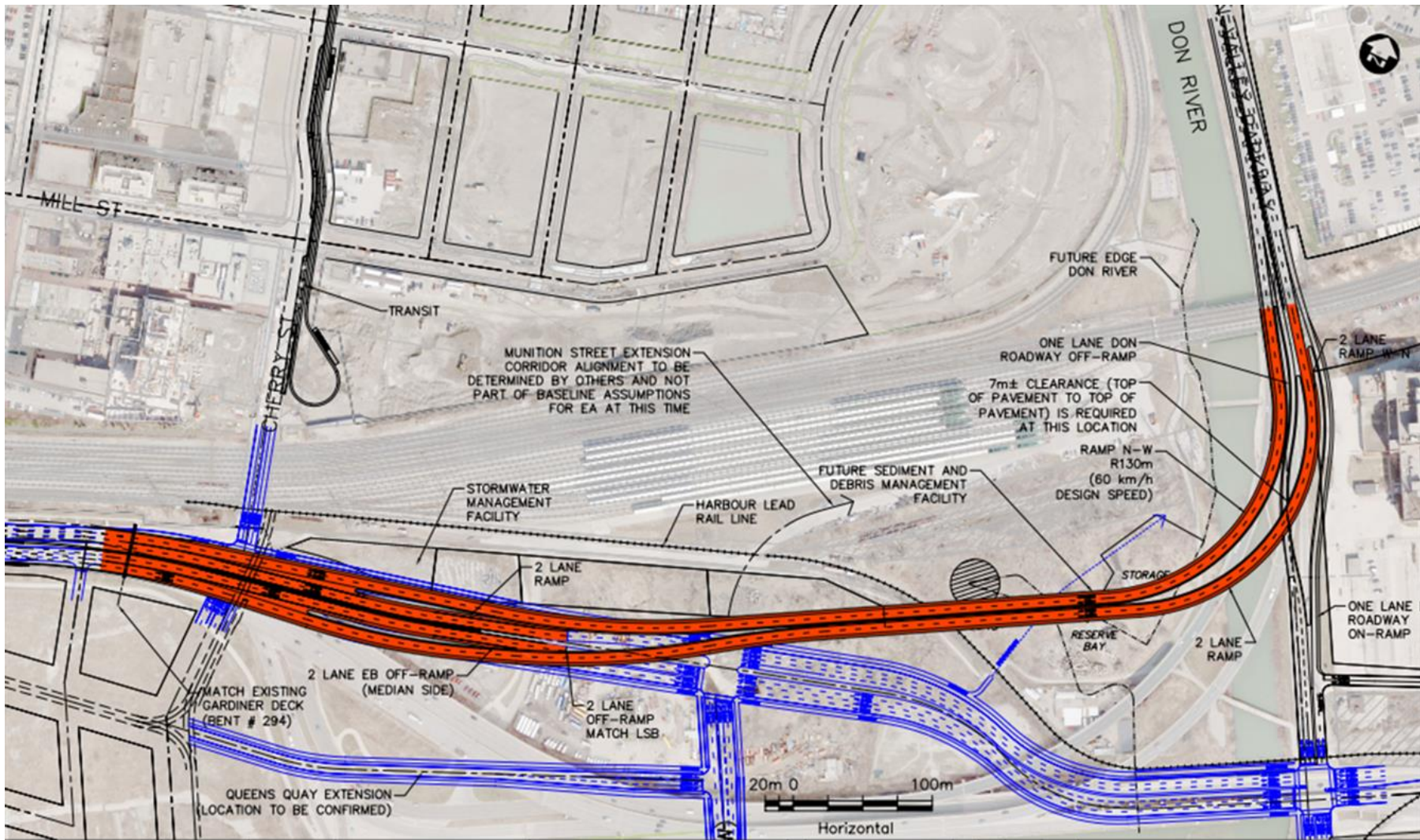


Figure 5-6: Hybrid Design Alternatives – Alignment Comparison

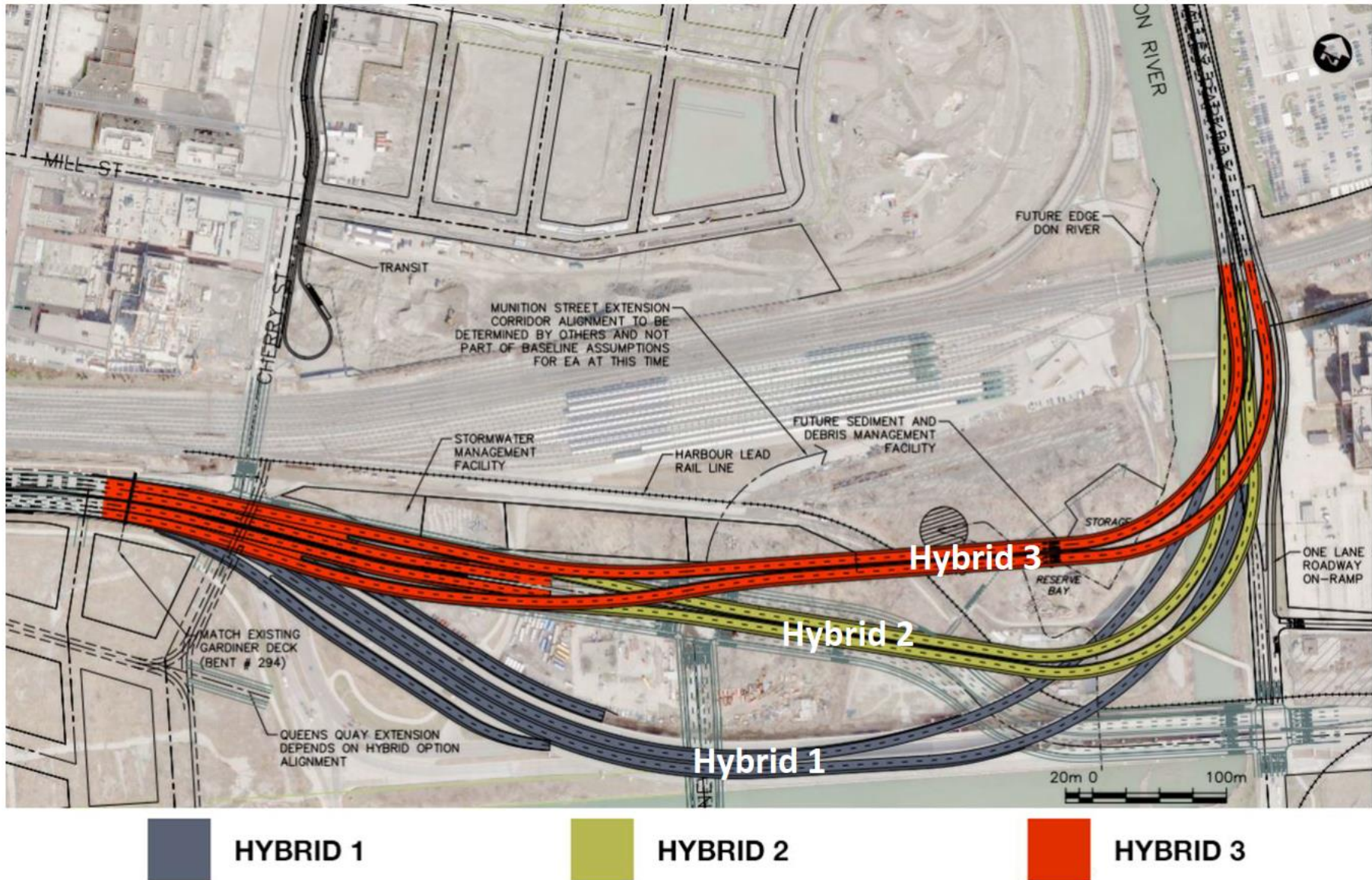


Figure 5-7: Hybrid Design Alternatives – Future Build-out Comparison

Hybrid Design Alternative 1: South



Hybrid Design Alternative 2: Mid



Hybrid Design Alternative 3: North



5.3 Hybrid Design Alternatives Evaluation Approach

The evaluation of alternative designs focuses on the three identified Hybrid alternatives that are located in the Keating Channel Precinct. The following presents the Hybrid design alternatives evaluation approach.

5.3.1 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
TRANSPORTATION and INFRASTRUCTURE		
Automobiles	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.
Transit	Transit Impact	Ability to accommodate new/future waterfront transit service.
Pedestrians	Pedestrian Access Through Keating Channel 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.
Cycling	East-West Movement	Ability to accommodate east-west cycling facilities and opportunities to connect with existing and planned north-south cycling facilities.

Study Lens/ Criteria Group	Criteria	Definition
Movement of Goods	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 costs to carriers and transporters (increased fuel consumption, driver time, need for more trucks on the road).
Safety	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 sight lines.
	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 sight lines, access ramps and intersection configuration.
	Safety Risk for Motorists on Gardiner Expressway	Extent of expressway road geometry that poses safety risk for drivers, particularly lack of shoulders.

Study Lens/ Criteria Group	Criteria	Definition
Construction Impact	Duration and Extent of Construction Impact	<p>Number of years required to complete construction, with an emphasis on the number of years that will result in traffic impacts.</p> <p>Potential for traffic infiltration onto side streets.</p> <p>Extent of pedestrian and cycling facilities to be affected during construction.</p>
	Private Property	Extent of private property to be used during construction and potential for access to private properties (e.g. driveways) to be impacted.
URBAN DESIGN		
Planning	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	<p>Impact on planned improvements to the Cherry Street/Lake Shore Boulevard intersection and its ability to serve as a gateway to the Port Lands.</p> <p>Impact on development phasing of waterfront precincts.</p> <p>Extent to which the goals, objectives and recommendations of the East Bayfront and Keating Channel 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.</p>

Study Lens/ Criteria Group	Criteria	Definition
Public Realm	Streetscape	Quality of place along Lake Shore Boulevard, Queens Quay extension and within the Keating Channel Precinct. Ability to create attractive and consistent streetscapes in Keating Channel 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 Channel Precinct including pedestrian areas, patios, passive recreation, multi-use trails and streetscaping. Ability to create an attractive pedestrian promenade with connection to the Keating Channel Precinct.
	New Open Space	Area and quality of open space in the Keating Channel Precinct that would be usable, complements the waterfront promenade and accommodates the cycling trail network.
Built Form	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
ENVIRONMENT		
Social & Health	Air Quality	Air quality conditions at the local and regional level, including changes in NO _x , VOCs, PM _{2.5} , as well as the level of greenhouse gas emissions.
	Noise	Noise level change at various receptors locations in the study area.
Natural Environment	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.
Cultural Resources	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.

Study Lens/ Criteria Group	Criteria	Definition
	Archaeology	Potential for impact on known buried resources or artefacts within the corridor.
	First Nations People and Activities	Potential for impact on the use of the study area by First Nations for traditional purposes.
ECONOMICS		
Global & Regional Economics	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.
Local Economics	Business Activity	Number of jobs created in the corridor and/or study area.
Direct Cost and Benefit	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 Channel Precinct and adjacent affected areas (e.g., Villiers Island) through the creation and sale of new land for the City.

5.3.2 Effects Assessment and 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.

5.3.3 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 19th 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, included as Appendix 4 to the City Staff Report (February 17, 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 its 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 Alternative 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 waterfront and overall 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 Alternative 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 Alternative 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 and to the mouth of the Don River;
- 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; and,
- Improves the at–grade experience for pedestrians and cyclists.

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 further refine Hybrid 3, including:

- Move the alignment further north
- 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.

5.4.1 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 that was provided to PWIC and is not repeated in this report.

5.4.1.1 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 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 the Keating Channel 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.

5.4.1.2 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 sight lines for pedestrians and cyclists. For cyclist safety, the assessment found no difference among the design alternatives in conflict points through Keating Channel 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 sight lines and adjustments to the design of the ramp entrances. AECOM's safety review and Dillon's response to it are available in **Appendix S, Road Safety Review**. 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 sight lines 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 sight lines 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 sight lines;
- 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 Channel 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.

5.4.1.3 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 construction staging report was completed by Morrison Hershfield and Dillon Consulting and is available in **Appendix T, Construction Staging Report**.

The construction staging 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 construction staging assessment were:

- Maintaining an appropriate number of travel lanes within the Gardiner–Lake Shore Boulevard 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 for bridge demolition to avoid potential safety concerns.

The following is a summary description of how the construction of each Hybrid design alternative could be phased. A future more detailed construction staging plan would need to consider coordination with other construction activities occurring in the study area within a similar time frame.

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 in both the northbound and southbound directions and realign to fit the future final alignment;
- Construct a new six-lane eastbound/westbound detour from Don Roadway and Lake Shore Boulevard intersection, continue south to Villiers Street and/or Commissioners Street, across Villiers Street and/or Commissioners Street, and then back north of Keating Channel before finally connecting to the existing Lake Shore Boulevard east of Cherry Street. The work will include construction of a bridge crossing across Keating Channel which may be done using a temporary timber deck bridge;
- 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 that are not in conflict with the existing structure or the existing Lake Shore Boulevard; and,
- Construct portions of the new Lake Shore Boulevard roadway that are not in conflict with the existing structure or the existing Lake Shore Boulevard.

Stage 1 – Westbound Demolition and Construction (1 year)

- Shut down the DVP ramp that travels from the north to the west and the Gardiner westbound lanes;
- Shut down the westbound lanes of the existing Lake Shore Boulevard, Don River Bridge, and Logan Ramp;
- Demolish westbound lanes of the 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;
- Carry out structural modifications to the DVP Ramp that travels from the north to the west [bent 324 to PS3 for Ps ramp] by shifting the bent locations to provide horizontal clearance for the new Lake Shore Boulevard alignment; and,

- Continue construction of the new Lake Shore Boulevard westbound lanes where not in conflict with the existing east to north DVP Ramp.

Stage 2 – Eastbound Demolition and Construction (1 year)

- Shut down the DVP Ramp that travels from the west to the north and the Gardiner eastbound lanes.
- Shut down eastbound lanes of the existing Lake Shore Boulevard, Don River Bridge, and Logan Ramp;
- 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 Gardiner eastbound lanes off ramp at Cherry Street;
- Carry out structural modifications to the DVP Ramp that travels from the west to the north [bent 327 to 330 for Pn ramp] by shifting the bent locations to provide horizontal clearance for the new Lake Shore Boulevard alignment; and,
- Complete construction of the new Lake Shore Boulevard.

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 in both the northbound and southbound directions and realign to fit the future final alignment;
- Construct a new six-lane eastbound/westbound detour from Don Roadway and Lake Shore Boulevard intersection, continue south to Villiers Street and/or Commissioners Street, across Villiers Street and/or Commissioners Street, and then back north of

Keating Channel before finally connecting to the existing Lake Shore Boulevard east of Cherry Street. The work will include construction of a bridge crossing across Keating Channel which may be done using a temporary timber deck bridge;

- Widen existing Jarvis Ramp and remark the pavement to carry two lanes with reduced speed; and,
- Begin construction of all structures and the new Lake Shore Boulevard roadway alignment (north of the existing Gardiner between Cherry Street and Don Roadway) that are not in conflict with the existing structure or the existing Lake Shore Boulevard.

Stage 1 – Westbound Demolition and Construction (1 year)

- Shut down and demolish the DVP ramp that travels from the north to the west, the Gardiner westbound lanes, Logan Ramp westbound, Don River Bridge westbound, and the existing Lake Shore Boulevard westbound lanes;
- Construct the new Don River Bridge westbound;
- Construct the new DVP Ramp that travels from the north to the west and the remainder of the Gardiner westbound lanes on ramp at Cherry Street;
- Complete construction of the new Lake Shore Boulevard westbound lanes; and,
- Shift traffic on Don Roadway to the east side.

Stage 2 – Eastbound Demolition and Construction (1 year)

- Shut down and demolish the DVP ramp that travels from the west to the north, the Gardiner eastbound lanes, Logan Ramp eastbound, Don River Bridge eastbound, and existing Lake Shore Boulevard eastbound lanes;
- Construct the new Don River Bridge eastbound;
- Construct the new DVP Ramp that travels from the west to the north and the remainder of the Gardiner eastbound lane off ramp at Cherry Street;
- Complete construction of the new Lake Shore Boulevard 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 (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)

- Staged replacement of existing Metrolinx Rail Bridge to a longer span structure for the segment crossing over the existing Don Valley Parkway and Don Roadway, while limiting disruption to rail service;
- Widen the existing Don Roadway in both the northbound and southbound directions and realign to fit the future final alignment;
- Construct a new 6 lane eastbound/westbound detour. The detour will begin at the Don Roadway and Lake Shore Boulevard intersection, continue south to Villiers Street and/or Commissioners Street, across Villiers Street and/or Commissioners Street, and then back north of Keating Channel before finally connecting to existing Lake Shore Boulevard east of Cherry Street. The work will include construction of a bridge crossing across Keating Channel which may be done using a temporary timber deck bridge;
- Widen Jarvis Ramp and remark the pavement to carry two lanes with reduced speed;
- Begin construction of all structures and the new Lake Shore Boulevard alignment (north of the existing Gardiner between Cherry Street and Don Roadway) that are not in conflict with the existing structure or the existing Lake Shore Boulevard; and,
- Construct a longer Metrolinx Rail Bridge for the segment crossing over the existing Don Roadway. (Given that the existing bridge is currently carrying only 4 tracks and wide enough to carry 6 tracks, it appears that a half and half replacement and reconfiguration can be carried out at this structure.

Stage 1 – Westbound Demolition and Construction (1 year)

- Shut down and demolish the DVP ramp that travels from the north to the west, the Gardiner westbound lanes, Logan Ramp westbound, Don River Bridge westbound, and existing Lake Shore Boulevard westbound lanes;
- Construct the new Don River Bridge westbound;
- Construct the new DVP Ramp that travels from the north to the west and the remainder of the Gardiner westbound lanes on ramp at Cherry Street;
- Complete construction of the new Lake Shore Boulevard westbound lane where not in conflict with the existing westbound/northbound DVP ramp; and,
- Shift traffic on Don Roadway to the east side.

Stage 2 – Eastbound Demolition and Construction (1 year)

- Shut down and demolish the DVP ramp that travels from the west to the north, the Gardiner eastbound lane, Logan Ramp eastbound, Don River Bridge eastbound, and existing Lake Shore Boulevard eastbound lanes;
- Construct the new Don River Bridge eastbound;
- Construct the new DVP Ramp that travels from the west to the north and the remainder of the Gardiner eastbound lanes off ramp at Cherry Street;
- Complete construction of the new Lake Shore Boulevard 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 (subject to completion of other plans and approvals required for these other road works).

For all of the design alternatives, construction of the realigned Lake Shore Boulevard 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.

5.4.1.4 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 Channel Precinct is the location of the ramps connecting the Gardiner to the DVP. **Figures 5–8, 5–9 and 5–10** provide the urban design plans for each of the three Hybrid design alternatives which were considered in the evaluation.

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 Channel 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 Channel Precinct development and add public space.

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 5–11, 5–12 and 5–13** illustrate the potential for the Keating Channel Water’s Edge Promenade for each Hybrid design alternative. Also, **Section 6.2** provides a description of the public realm improvements that are proposed for the entire Gardiner East corridor.

Figure 5-8: Hybrid Design Alternative 1 (South) – Urban Design Plan

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

HYBRID ALTERNATIVE 1

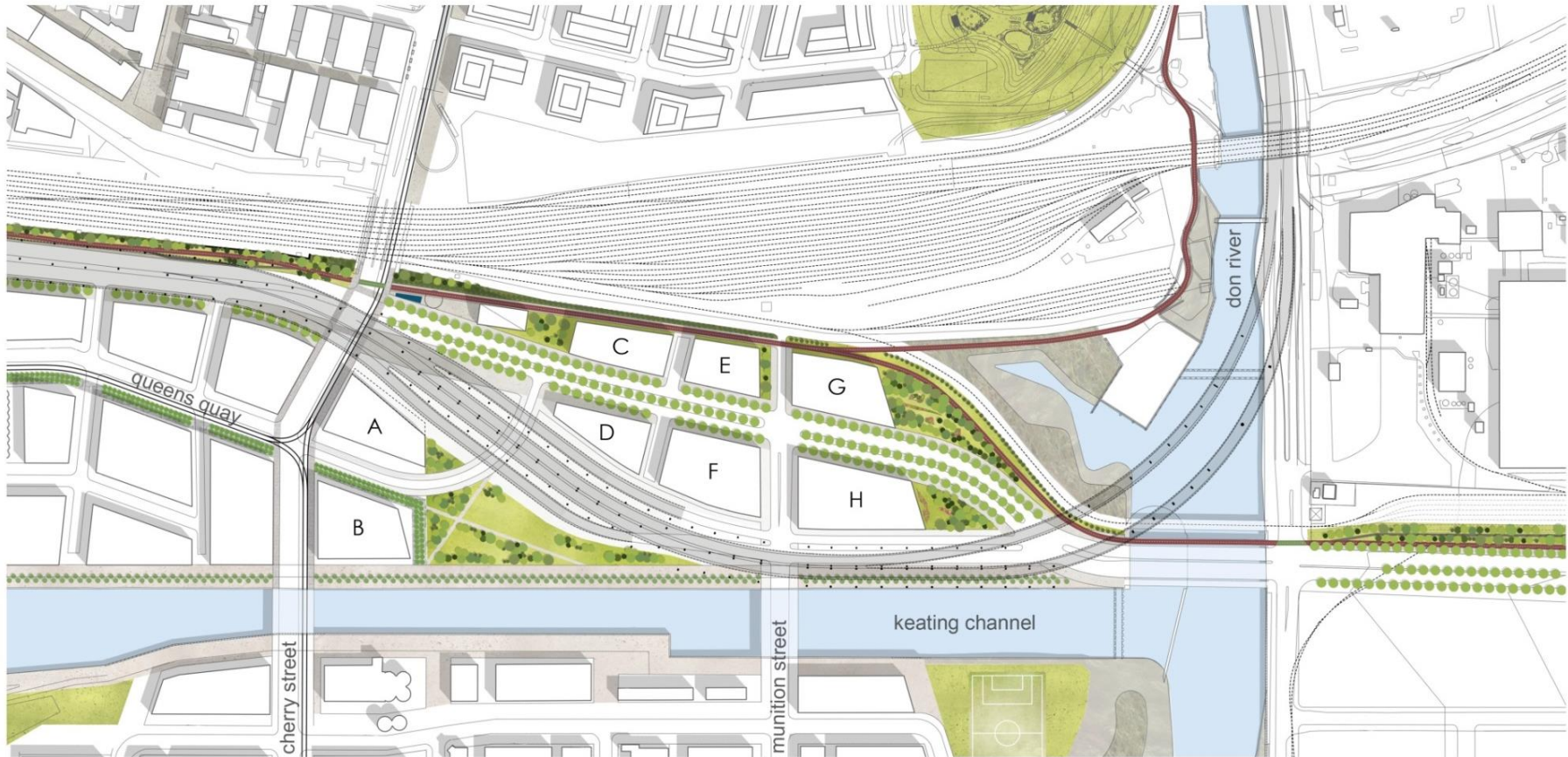


Figure 5-9: Hybrid Design Alternative 2 (Mid-Precinct) – Urban Design Plan

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

HYBRID ALTERNATIVE 2

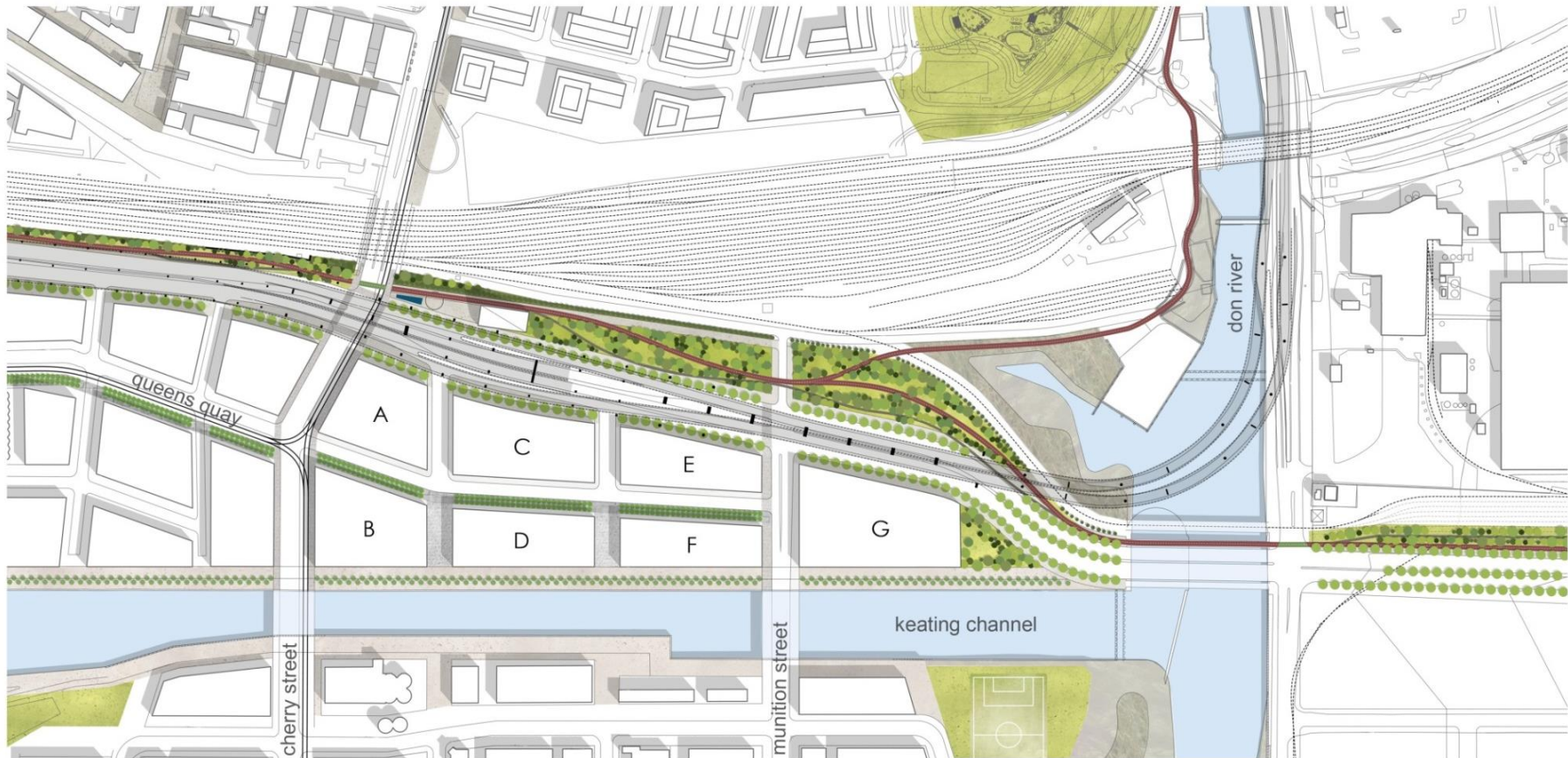


Figure 5-10: Hybrid Design Alternative 3 (North) – Urban Design Plan

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HYBRID ALTERNATIVE 3

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

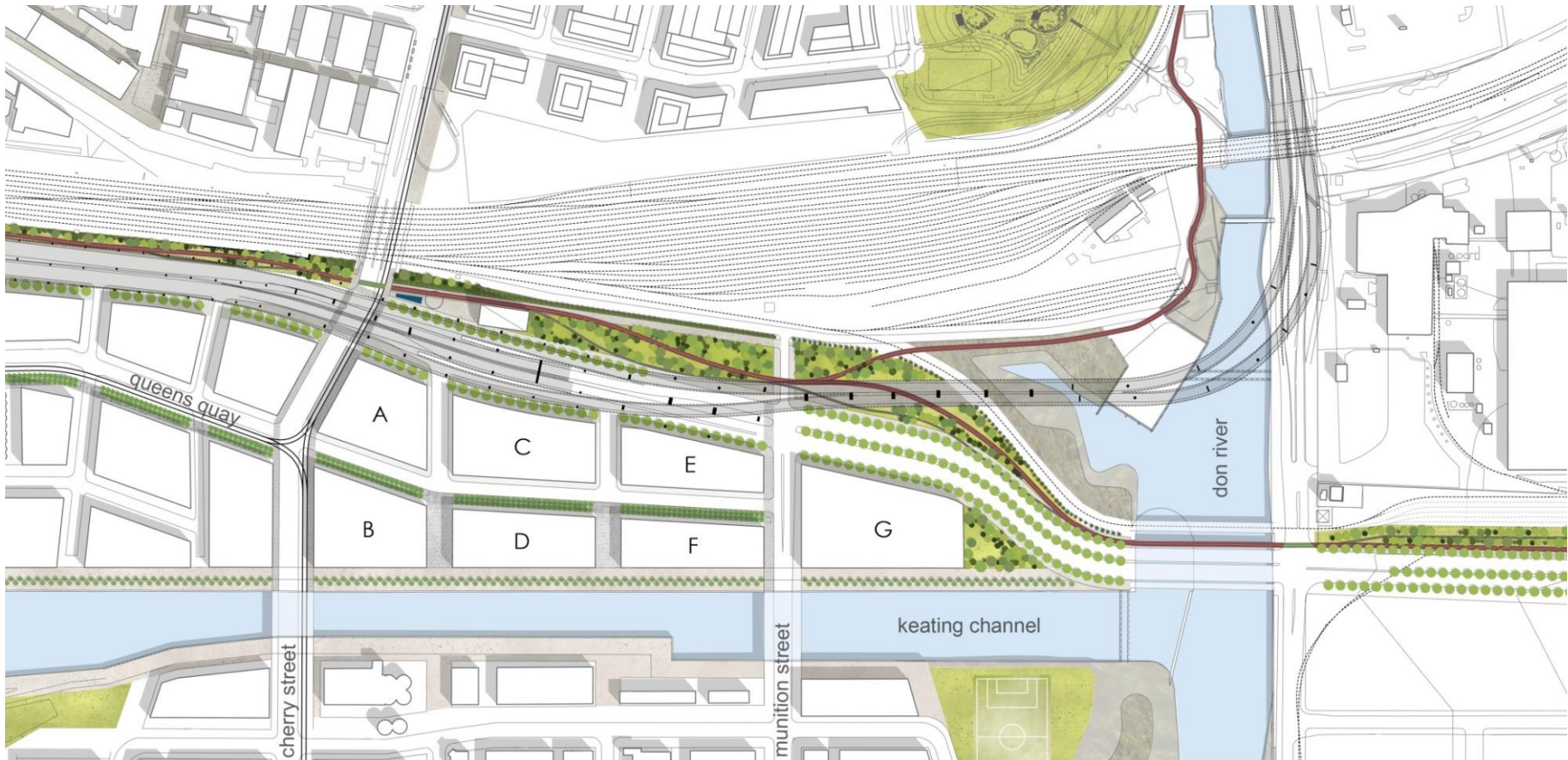


Figure 5-11: Hybrid Design Alternative 1 – Keating Channel Water’s Edge Promenade – Looking West



Figure 5-12: Hybrid Design Alternative 2 – Keating Channel Water’s Edge Promenade – Looking West



Figure 5-13: Hybrid Design Alternative 3 – Keating Channel Water’s Edge Promenade – Looking West



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 5-14, 5-15 and 5-16** 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 5-14: Hybrid Design Alternative 1 - Keating Channel Precinct Conceptual Built Form



Figure 5-15: Hybrid Design Alternative 2 - Keating Channel Precinct Conceptual Built Form



Figure 5-16: Hybrid Design Alternative 3 – Keating Channel Precinct Conceptual Built Form



5.4.1.5 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 Channel 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 Channel Precinct and construction disturbance effects to adjacent properties would be minimal.

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.

Social and 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.

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.

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, due in part to its lesser impact on the mouth of the Don River. Hybrid Design Alternative 2 is moderately preferred and Hybrid Design Alternative 1 is least preferred.

5.4.1.6 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 the proposed First Gulf development that is projected to generate in excess of 25,000 new jobs. Overall, it is noted that improvements to the waterfront and waterfront connectivity may increase economic competitiveness of the area.

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.

Costing Approach

Indicative cost estimates were prepared using comprehensive procedures suitable for a complex, urban infrastructure project. The employed methodology was peer reviewed by Delcan 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 the Ontario Ministry of Transportation'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 Street and Cherry Street in the west. Estimates included determination of costs for the following new work components:

- Roadworks (Lake Shore Boulevard), 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 lifecycle costing analysis (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 Lake Shore Boulevard resurfacing and renewal west of Cherry Street, new Lake Shore Boulevard and sideroads east of Cherry Street, new Lake Shore Boulevard–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-year life span. The LCCA used costs calculated in 2013 dollars throughout with a 4% discount rate.

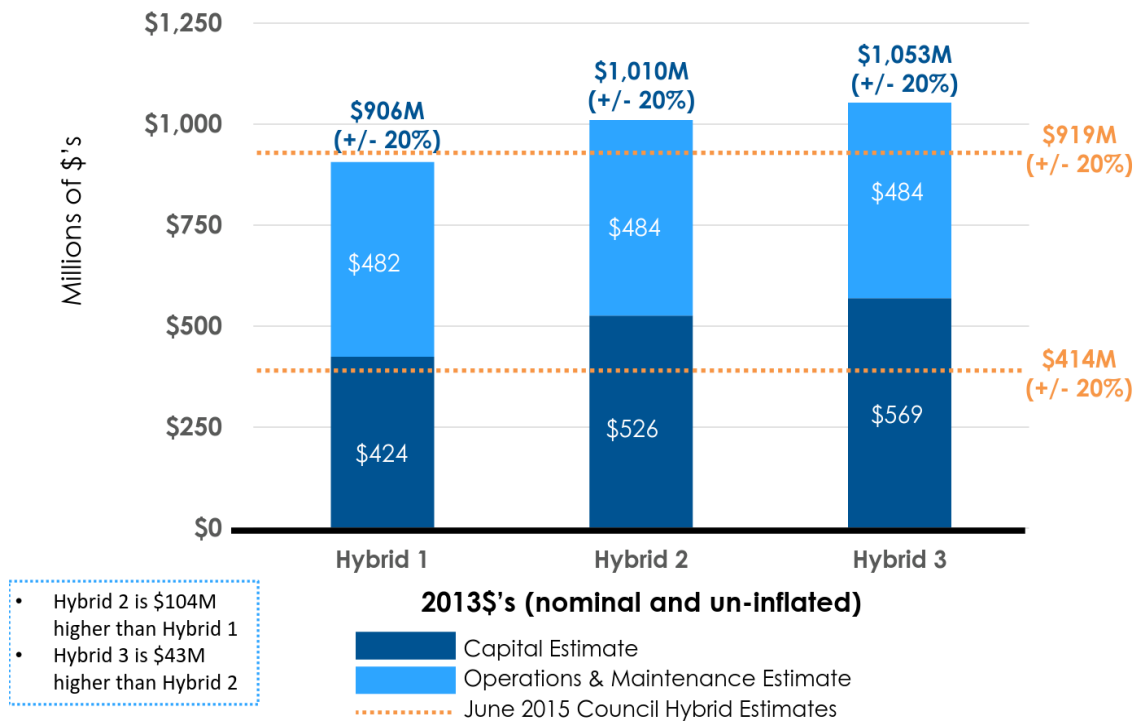
Appendix O further describes the assumptions regarding the capital cost calculations. The estimated costs that were developed are high-level estimates that were developed on the bases of the concept plans for each design alternative and are intended for comparative purposes.

Costing Results

Figures 5-17 and 5-18 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 alignment of the 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 an 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. Consultation with First Gulf and other relevant property owners in the area is ongoing.

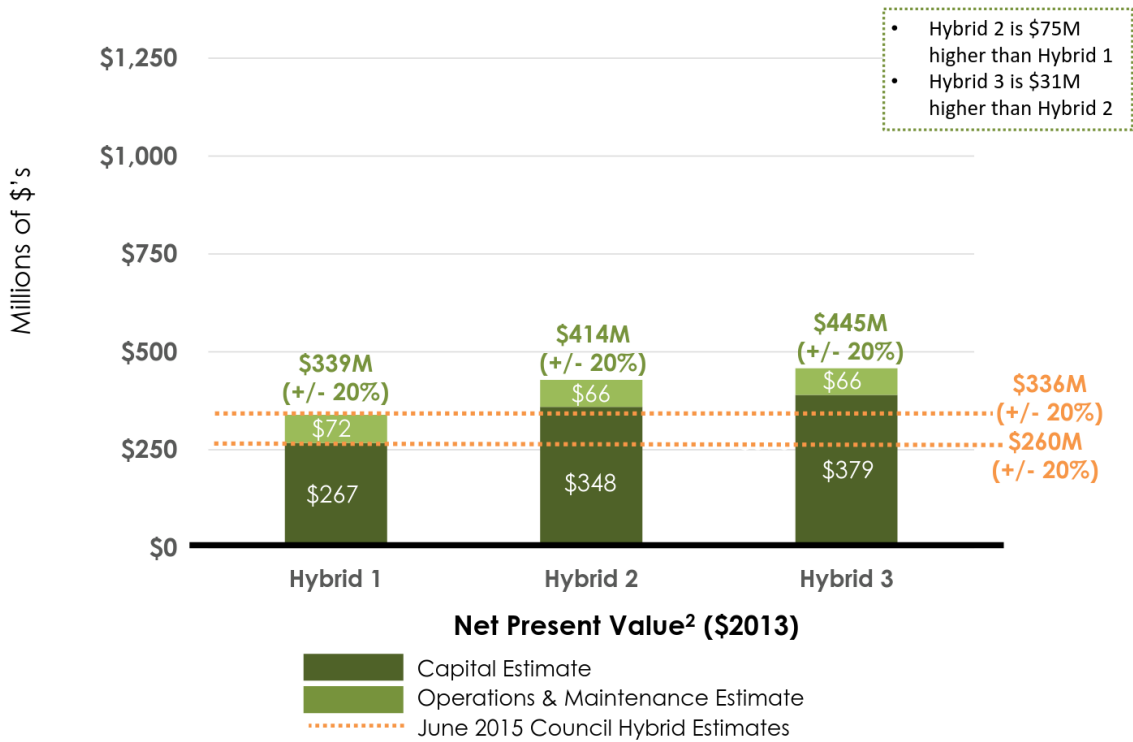
Lifecycle Infrastructure Costs as a net present value (NPV) were determined and include the total capital cost and the 100-year operations and maintenance costs for each alternative. Hybrid Design Alternative 1 was ranked *preferred* in this category with the lowest NPV lifecycle infrastructure cost (\$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 5-17 and 5-18 provide a breakdown of the 100-year lifecycle infrastructure costs in 2013\$ and NPV.

Figure 5-17: Design Alternatives Lifecycle Infrastructure Costs 2013\$



¹ All costs are high level order of magnitude prepared for comparative purposes only.

Figure 5-18: Design Alternatives Infrastructure Lifecycle Costs NPV



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

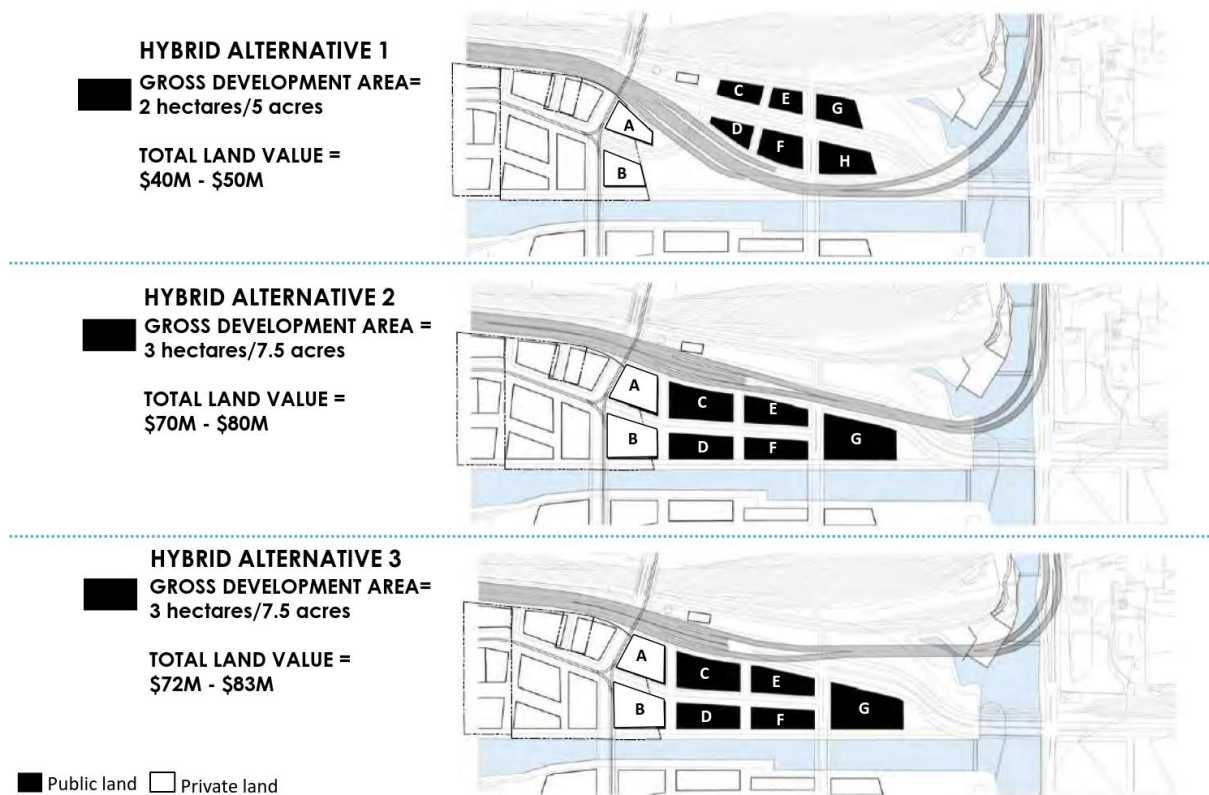
Land Value Creation and Net Cost

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 U, Land Valuation Report.**)

Figure 5-19 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 Channel Precinct City owned 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 Hybrid Design 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 and hence more desirable. 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 5-19: 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.

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 Channel 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: Design Alternatives Evaluation Matrix

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.	
			Automobiles Summary Ranking	⚠ MODERATELY PREFERRED	✓ PREFERRED	✓ 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.
		Transit Summary Ranking			⚠ 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.		
Pedestrians Summary Ranking			⚠ 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.		
Cycling Summary Ranking			✓ EQUALLY PREFERRED	✓ EQUALLY PREFERRED	✓ EQUALLY PREFERRED		

Table 5.2: Design Alternatives Evaluation Matrix

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)	✓ Equally Preferred - No noticeable difference in travel times, truck movements and Gardiner access among the alternatives.	✓ Equally Preferred - No noticeable difference in travel times, truck movements and Gardiner access among the alternatives.	✓ Equally Preferred - 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	⦿ Moderately Preferred - 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.	✓ Preferred - 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.	✓ Preferred - 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	✓ Equally Preferred - No noticeable difference in transport and shipper costs between the designs.	✓ Equally Preferred - No noticeable difference in transport and shipper costs between the designs.	✓ Equally Preferred - No noticeable difference in transport and shipper costs between the designs.
Movement of Goods Summary Ranking				⦿ MODERATELY PREFERRED	✓ PREFERRED	✓ PREFERRED
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	⦿ Moderately Preferred - 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.	✓ Preferred - 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.	✓ Preferred - 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	✓ Equally Preferred - All have similar ability to provide a safe east-west cycling facility.	✓ Equally Preferred - All have similar ability to provide a safe east-west cycling facility.	✓ Equally Preferred - 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	⦿ Moderately Preferred - Potential sightline issues with east-bound exit ramp due to existing Gardiner support columns.	✓ Preferred - better sightlines when exiting the east-bound ramp.	✓ Preferred - 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	⦿ Moderately Preferred - 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.	✓ Preferred - 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.	✓ Preferred - 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.
Safety Summary Ranking				⦿ MODERATELY PREFERRED	✓ PREFERRED	✓ PREFERRED
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	✓ Preferred - 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).	✗ Less Preferred - 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).	⦿ Moderately Preferred - 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	✓ Preferred - 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.	⦿ Moderately Preferred - Requires closing expressway use east of Cherry Street for a period which may result in traffic infiltration onto side streets.	⦿ Moderately Preferred - Requires closing expressway use east of Cherry Street for a period which may result in traffic infiltration onto side streets.

Table 5.2: Design Alternatives Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative Design 1	Alternative Design 2	Alternative Design 3
			Potential impact to pedestrian/ cycling infrastructure during construction	✓ Equally Preferred - East-west cycling passage can be equally accommodated with detours during construction.	✓ Equally Preferred - East-west cycling passage can be equally accommodated with detours during construction.	✓ Equally Preferred - East-west cycling passage can be equally accommodated with detours during construction.
	A 7.3 Private Property	Potential need for private property for construction staging/ detours		✓ Preferred - Use of existing Gardiner-Don Valley Parkway connection provides opportunity to limit use of private property for staging and detours.	⦿ Moderately Preferred - Replacement of Gardiner-Don Valley Parkway connection may require more private property for staging and detours than Hybrid 1.	⦿ Moderately Preferred - 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		✓ Preferred - Use of existing Gardiner-Don Valley Parkway will result in less disruption to property access.	⦿ Moderately Preferred - Replacement of Gardiner-Don Valley Parkway connection will result in greater disruption to property access.	⦿ Moderately Preferred - Replacement of Gardiner-Don Valley Parkway connection will result in greater disruption to property access.
Construction Impact Summary Ranking				✓ PREFERRED	✗ LESS PREFERRED	⦿ MODERATELY PREFERRED
OVERALL RATING: TRANSPORTATION & INFRASTRUCTURE				✗ Less Preferred	⦿ Moderately Preferred	✓ Preferred
B. Urban Design	B.1 Planning	B 1.1 Consistency with Official Plans	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>	⦿ Moderately Preferred - 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.	✓ Preferred - 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.	✓ Preferred - 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 1.2 Consistency with Precinct Plans and Other Plans and Initiatives	Impact on planned improvements to the Cherry St./Lake Shore Blvd. intersection and its ability to serve as a gateway to the Port Lands	⦿ Moderately Preferred - Consistent with physical plans but does not enhance opportunities at the Cherry/Lake Shore intersection. Widest intersection due to physical infrastructure of Gardiner Expressway.	✓ Preferred - 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.	✓ Preferred - 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	⦿ Moderately Preferred - Infrastructure does not enhance attractiveness of development parcels.	✓ Preferred - Parcels along Keating Channel become more attractive and thus more likely to be developed.	✓ Preferred - 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	⦿ Moderately Preferred - 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.	✓ Preferred - 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.	✓ Preferred - 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.
Planning Summary Ranking				⦿ Moderately Preferred	✓ Preferred	✓ Preferred
B.2 Public Realm	B.2.1 Streetscape		Quality of place along Lake Shore Boulevard, Queens Quay extension and within the Keating Precinct	✗ Less Preferred - 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.	⦿ Moderately Preferred - 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.	✓ Preferred - 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	⦿ Moderately Preferred - 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.	✓ Preferred - 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.	✓ Preferred - 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: Design Alternatives Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative Design 1	Alternative Design 2	Alternative Design 3
	B 2.2 View Corridors	Ability to create high-quality visual connections along roadways, among the Precincts, and to/from the water		Less Preferred - 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.	Moderately Preferred - 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.	Preferred - 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		Less Preferred - 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.	Moderately Preferred - 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.	Preferred - 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 2.3 Public Realm	Ability to create an attractive public realm in the Keating Precinct including pedestrian areas, patios, passive recreation, multi-use trails and streetscaping		Moderately Preferred - Minimal improvements along Lake Shore Blvd. Gardiner infrastructure along Keating Channel and crossing Don River limits public realm improvements.	Preferred - 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.	Preferred - 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)		Moderately Preferred - 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).	Preferred - Consistent attractive pedestrian promenade. 625m of unencumbered pedestrian water's edge promenade (between Don River and Cherry Street).	Preferred - Consistent attractive pedestrian promenade. 625m of unencumbered pedestrian water's edge promenade (between Don River and Cherry Street).
	B 2.4 New Open Space		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		Less Preferred - Total open space of 1.9 ha. Waterfront promenade impacted by Gardiner infrastructure. Achieves cycling trail network.	Preferred - Total open space of 2.0 ha. Park land complements the waterfront promenade and achieves cycling trail network.
Public Realm Summary Ranking				Less Preferred	Moderately Preferred	Preferred
B.3 Built Form	B.3.1 Street Frontage	Length of leasable, active, at-grade space along Lake Shore and Queens Quay that would support high quality development including retail		Moderately Preferred - 600 m of active street frontage along Lake Shore Blvd (both sides of the street) and 100 m along Queens Quay.	Preferred - 750 m of active street frontage along Queens Quay (both sides of the street); 600 m along Keating Channel; 160 m along Munition Street.	Preferred - 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		Moderately Preferred - 355 m of above-grade development along Lake Shore Blvd impacted by proximity to elevated expressway.	Less Preferred - 440 m of above-grade development along Lake Shore Blvd impacted by proximity to elevated expressway.	Preferred - 300 m of above-grade development along Lake Shore Blvd impacted by proximity to elevated expressway.
Built Form Summary Ranking				LESS PREFERRED	MODERATELY PREFERRED	PREFERRED
OVERALL RATING: URBAN DESIGN				Less Preferred	Moderately Preferred	Preferred

Table 5.2: Design Alternatives Evaluation Matrix

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.	
Social & Health Summary Ranking				⦿ MODERATELY PREFERRED	✓ PREFERRED	✓ PREFERRED
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.		
Natural Environment Summary Ranking				✗ Less Preferred	⦿ Moderately Preferred	✓ Preferred

Table 5.2: Design Alternatives Evaluation Matrix

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	✓ Equally Preferred: 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	✓ Equally Preferred: 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	✓ Equally Preferred: 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	✓ Equally Preferred: 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.	
Cultural Resources Summary Ranking				✓	EQUALLY PREFERRED	
OVERALL RATING: ENVIRONMENT				⦿ Moderately Preferred	✓ Preferred	✓ Preferred
D. Economics	D.1 Global & Regional Economics	D.1.1 Toronto's Global Competitiveness	Potential for change in Toronto's Global Competitiveness	✓ Equally Preferred – 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	✓ Equally Preferred - Change to the regional attractiveness of downtown Toronto is not expected.	
			D.1.3 Mobility within Downtown	Potential for change in mobility within Downtown	✓ Equally Preferred - Relatively little difference among the alternatives in effects to mobility within the Downtown from the project.	
				Disruption During Construction	✓ Preferred - 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.	⦿ Moderately Preferred - 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	✓ Equally Preferred - 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.				
Global and Regional Economics Summary Ranking				✓ Preferred	⦿ Moderately Preferred	⦿ Moderately Preferred
D.2 Local Economics	D.2.1 Business Activity	Number of potential new jobs in corridor and/or study area	✓ Equally Preferred - 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.			
Local Economics Summary Ranking					✓ EQUALLY PREFERRED	
D.3 Direct Cost and Benefits	D.3.1 Capital Cost	Total Hybrid capital cost (in 2013\$)	Property acquisition	✓ Preferred - \$424million	⦿ Moderately Preferred - \$526 million	✗ Less preferred - \$569 million
			Property acquisition	✓ Preferred - None	⦿ Moderately Preferred - Potential need for private property for construction detouring	✗ Less Preferred - 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	NPV 100 year life cycle cost (includes total capital cost + 100yr operations and maintenance cost) *Figures are +/- 20%	✓ Preferred - \$339 million	⦿ Moderately Preferred - \$414 million	✗ Less preferred - \$445 million	
	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.	⦿ Moderately Preferred - \$40 - \$50 million	✓ Preferred - \$70 to \$80 million	✓ Preferred - \$72 to \$83 million	
Direct Cost and Benefit Summary Ranking				✓ Preferred	⦿ Moderately Preferred	✗ Less Preferred
OVERALL RATING: ECONOMICS				✓ PREFERRED	⦿ MODERATELY PREFERRED	✗ LESS PREFERRED

5.4.2 Alternatives Comparison Summary – Keating Channel 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:

- Revitalization of the Don River Mouth and Flood Protection project;
- Development of the First Gulf site; and,
- 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 Channel 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 \$31 million 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, higher value to development blocks south of Lake Shore Boulevard, and greater section of Lake Shore Boulevard open to light and air allowing for improved public realm. Considering these benefits, combined with its public support, Alternative 3 is therefore recommended as preferred.

5.5 Alternative Designs Conclusion

The design alternatives phase of work for the Gardiner East EA has included a detailed examination of Keating Channel Precinct possibilities and design potential. The evaluation of the three Hybrid design alternatives prepared for the Keating Channel Precinct segment of the corridor demonstrate the trade-offs among the alternatives on the basis of the evaluation criteria and measures. Overall, Hybrid Design Alternatives 2 and 3 are more desirable for Transportation, Urban Design and Environment. Alternative 3 is more desirable than Alternative 2 for Urban Design and Environment. However, Alternative 3 is more expensive than Alternative 2, with an additional capital cost of approximately \$31 million NPV.

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

Considering the identified trade-offs among the Hybrid design alternatives and the input received from stakeholders, Hybrid Design Alternative 3 is recommended as preferred. To complement the preferred Hybrid Design 3, public realm and streetscape improvements from Jarvis Street to Cherry Street and from Don Roadway to Logan Ave are also proposed and are described in **Section 6.2**. The Hybrid design alternatives evaluation and recommendations were presented to PWIC on March 1, 2016 and to City Council on March 31, 2016. City Council approved Hybrid Design Alternative 3 as the Preferred Design for the Gardiner East EA undertaking and authorized the completion of the EA and final EA Report to be submitted to the MOECC.

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.

