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PW11.1

TORONTO

STAFF REPORT
ACTION REQUIRED

Gardiner Expressway and Lake Shore Boulevard East Reconfiguration Environmental Assessment (EA) and Integrated Urban Design Study – Evaluation of Preferred Design

Date:	February 17, 2016
To:	Public Works and Infrastructure Committee
From:	Deputy City Manager, Cluster B
Wards:	Ward 28 – Toronto Centre-Rosedale Ward 30 – Toronto-Danforth
Reference Number:	P:\2016\ClusterB\WF\PW16001

SUMMARY

This report recommends "Hybrid" Alternative Design 3 to Toronto City Council as the "Preferred Design" for the Gardiner Expressway and Lake Shore Boulevard East Reconfiguration Environmental Assessment and Integrated Urban Design Study (Gardiner East EA). The Gardiner East EA study area is a 2.4-kilometre segment of the elevated expressway and Lake Shore Boulevard, from approximately Lower Jarvis Street to Logan Avenue.

A final decision on the Gardiner East EA is imperative given the current condition of the elevated Gardiner East. Ongoing interim repairs are only intended to extend the service life of the structure to 2020. The City needs to incorporate the outcome of the EA into the approved Strategic Plan for the Rehabilitation of the F.G. Gardiner Expressway (Gardiner Strategic Plan) and advance the necessary planning, engineering design and procurement work for rehabilitation. Final direction from Toronto City Council on a Preferred Design will allow the project team to complete and submit the EA report to the Ministry of Environment and Climate Change (MOECC) to facilitate detailed design and construction work within the required timeframes.

More than seven years since it began, the Gardiner East EA study is now nearing completion. The study's "Alternative Solutions" phase concluded in June 2015 with City

Council endorsement of the Hybrid as the "Preferred Solution". Since June 2015, the project team has advanced three alternative versions of the Hybrid. The three Hybrid Alternative Designs are:

- Hybrid 1: Revised Hybrid with tighter ramps in the Keating Channel Precinct;
- Hybrid 2: New Hybrid with alignment further north; and
- Hybrid 3: New Hybrid with alignment further north and rail bridge underpass widening.

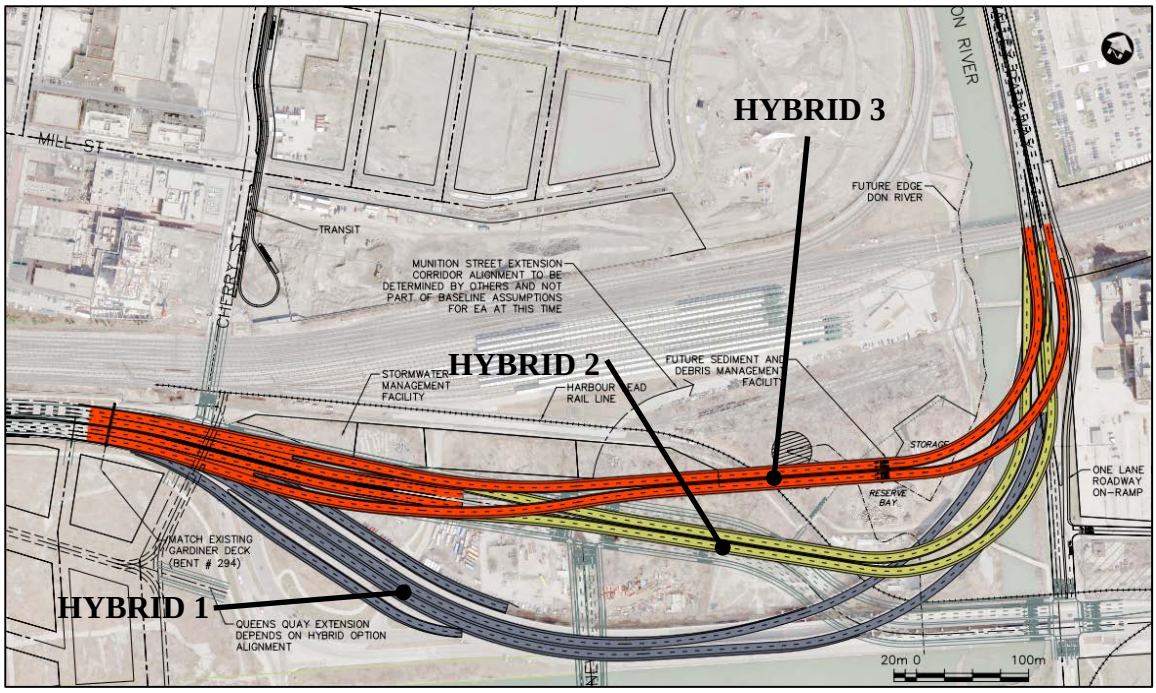

Figure 1: Overlay of Hybrid Alternative Designs

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; and
- Full compatibility with planned rehabilitation of the elevated Gardiner Expressway west of Cherry Street.

The project team identified and evaluated the key differences between each Hybrid Alternative Design using criteria consistent with the EA study Terms of Reference. These findings were presented at a number of Stakeholder Advisory Committee (SAC) meetings, and at a January 19, 2016 Public Open House. Considering the evaluation

results and stakeholder input, Hybrid 3 was received most favourably and emerged as best meeting project goals and objectives. The project team is therefore recommending Hybrid 3 as the Preferred Design.

Hybrid 3 supports the city-building potential of the Keating Channel Precinct – a planned mixed-use waterfront community that will evolve as the gateway to a revitalized Port Lands and accessible Keating Channel. This would be accomplished by rebuilding the elevated portion of the Gardiner as far north from the Keating Channel as is feasible. Implementation of the design would provide unencumbered access to a planned waterfront promenade, better conditions for creating future high-quality park, open space and pedestrian-friendly environments and more valuable development blocks. By comparison, Hybrid 2 would achieve some but not all of the urban design benefits described above. Hybrid 1 would result in a neighbourhood flanked on both sides by rail and expressway infrastructure, bisected by Lake Shore Boulevard and separated from the water's edge by an elevated expressway with associated on/off ramps.

From an environmental perspective, Hybrid 3 would have the least physical and visual impact on the planned revitalization of the Don River. Implementation of this design would have the least impact on future sediment management activities, as well as the least amount of physical infrastructure, including structural piers, to be located within the river itself (with details to be confirmed at the detailed design stage). Hybrid 3 would create development patterns that would buffer the expressway's sensory impacts (noise, views, vibration, etc.) from the Keating Channel and related open space. This physical buffer – not possible in Hybrid 1 as the expressway would run along the northern edge of the channel – would improve the access, views and enjoyment of the waterfront promenades planned for both the Keating Channel Precinct and nearby Villiers Island. As with the Urban Design criteria, Hybrid 2 would achieve some but not all of the environmental benefits of Hybrid 3. In particular, Hybrid 2 is less preferred than Hybrid 3 with respect to the future operations of the Don River sediment management facility.

For the Transportation and Infrastructure criteria, Hybrids 2 and 3 rank the same or preferred relative to Hybrid 1 in most categories. The main exception is for construction impacts because Hybrid 1 would involve only two to three years of traffic detours. Hybrids 2 and 3 are closely ranked, although Hybrid 3 would allow for a greater amount of the new Gardiner-DVP ramps to be constructed while maintaining existing road traffic. Furthermore, the widening of the Metrolinx Don River rail bridge underpass associated with Hybrid 3 would provide additional opportunities for road detours that would reduce traffic disruption.

As part of the EA study's economic analysis, high-level infrastructure capital costs were estimated. These costs, reflected below in as spent dollars (inflated by 2.5% annually until the year of construction) were based on conceptual designs and are plus or minus a 20% margin of error. Hybrid 1 has the lowest estimated capital cost at $532 million. Hybrid 2 has the second lowest estimated capital cost at $664 million, $132 million higher than Hybrid 1. Hybrid 3 has the highest capital cost estimate at $718 million, $186

million higher than Hybrid 1, because of additional construction costs associated with widening the Metrolinx Don River rail bridge.

Notwithstanding the higher capital costs associated with Hybrid 3, the project team recommends Hybrid 3 in light of the many legacy waterfront improvements afforded by a more northern alignment of the Gardiner Expressway. Additionally, estimated public land value creation is maximized in Hybrid 3. While each of the Hybrid options would unlock new development land within the Keating Channel Precinct to varying degrees (the majority of which is within public ownership), the desirability, value, and total land area of new development blocks would be considerably higher in Hybrid 3 (approximately 7.5 acres valued at approximately $72-$83 million) when compared to Hybrid 1 (approximately 5 acres, valued at approximately $40-$50 million).

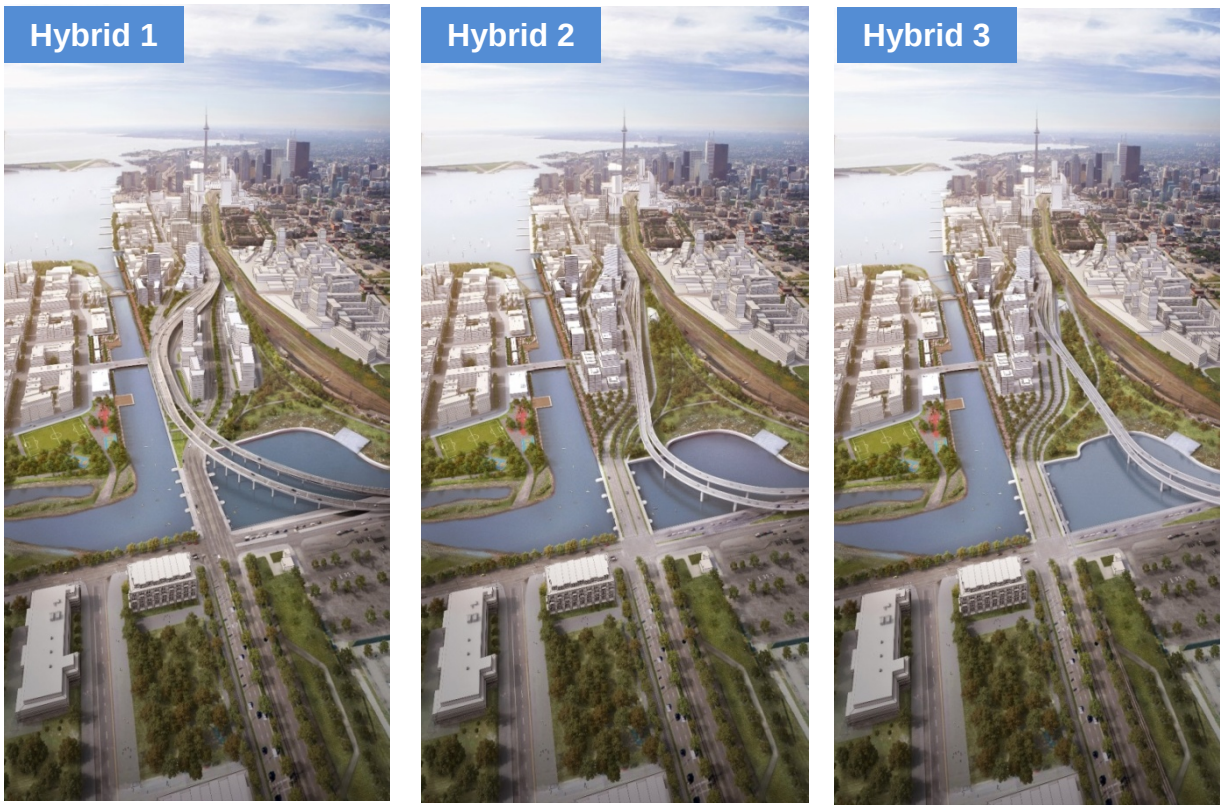

Figure 2: Bird's Eye Renderings of Hybrid Alternative Designs

In addition to the three Hybrid Alternative Designs evaluated in this stage of the EA, two third-party proposals (the "Green Gardiner" and the "Viaduct") were presented by independent design/engineering teams. These proposals were evaluated by the project team. Though no further study of either option is recommended within the scope of the

Gardiner East EA process, the project team credits these proposals for informing and improving the Alternative Designs east of Cherry Street.

After due consideration of results from the evaluation framework, and feedback provided through the stakeholder engagement process, Hybrid 3 is recommended by the project team for identification as the Preferred Design within the final EA report that is to be submitted to MOECC for review and approval. Upon receipt of Council direction for a Preferred Design, a Draft EA Report is targeted for circulation and comment in April 2016, followed by submission of a Final EA Report to MOECC in June 2016. An EA approval decision is expected by early 2017.

Consistent with the October 2015 direction from City Council, the future outcome of the Gardiner East EA will be incorporated into the scope of work for the overall rehabilitation of the F.G. Gardiner Expressway, as documented in the previously approved Gardiner Strategic Plan. This scope consolidation offers efficiencies of scale which can be expected to decrease overall project construction costs, and should permit a coordinated construction mitigation strategy to significantly reduce the construction related traffic impacts and detours.

The 2016 to 2025 Capital Budget and Plan for Transportation Services includes $2.259 billion in funding for the Gardiner Strategic Plan, which reflects the portion of the estimated $2.6 billion in total construction costs required over a 10-year planning period. The current $2.6 billion total project cost estimate includes $524 million in costs for the assumed "base case" design of the Hybrid EA Preferred Alternative. It is estimated that additional capital funding of $194 million will be required to implement the Hybrid 3 Alternative Design, which brings the most current cost estimate to $718 million.

Cost estimates provided by the Gardiner East EA consultant are order-of-magnitude costs for comparative purposes. The consultant has consistently advised of a potential variance of up to plus or minus 20%. Staff will report back through Budget Committee on required budget adjustments to the Gardiner Strategic Plan following Council's approval of a Hybrid Preferred Design, as well as any adjustments to costs resulting from forthcoming Class C cost estimates.

This report also includes a recommendation for a report to Public Works and Infrastructure Committee on an implementation strategy for the proposed Gardiner East EA public realm improvements. An implementation strategy is needed to identify how proposed public realm improvements can best be coordinated among the Gardiner Strategic Plan and other area initiatives. The strategy would include an approach to phasing that integrates with other area planning processes, and explore opportunities for cost-sharing among the Gardiner Strategic Plan, area initiatives, other City programs, and private land owners/developers. City staff would report through the 2017 Capital Budget process on funding options related to the proposed Gardiner East EA public realm improvements. It is important to note that the cost of public realm improvements is not included in the $2.6 billion Gardiner budget, nor are the costs included the Hybrid alternative 3 cost estimate of $718 million.

In line with previous Council direction, this report includes a recommendation for the Chief Planner and Executive Director of City Planning, working with Waterfront Toronto, to undertake a review of the Keating Channel Precinct Plan once the Gardiner East EA has been approved by the MOECC.

In addition, this report includes a recommendation for the General Manager of Transportation Services to undertake an in-depth safety review of the Jarvis Street and Lake Shore Boulevard intersection, and report back on improvements that can be made as part of detailed design and implementation of the Gardiner Strategic Plan, or through other projects and initiatives.

Information about the Gardiner East EA, including summaries related to public consultation, can be found on the project web site at www.gardinereast.ca.

RECOMMENDATIONS

The Deputy City Manager, Cluster B, recommends that:

1. City Council approve Hybrid Alternative Design 3 as the Preferred Design for the Gardiner East EA;

2. City Council authorize staff to complete the Gardiner East EA and submit the final EA report to the Ontario Minister of the Environment and Climate Change for review and approval, and request the Minister to complete the review of the Gardiner East EA as expeditiously as possible;

3. City Council direct the Deputy City Manager, Cluster B, and Deputy City Manager & Chief Financial Officer and the appropriate officials to report to Budget Committee on implementation funding for the preferred EA alternative design following completion of Class C cost estimates;

4. City Council direct the Deputy City Manager, Cluster B, to report to Public Works and Infrastructure Committee by Q4 2016 with an implementation strategy for proposed Gardiner East EA public realm improvements;

5. City Council direct the Deputy City Manager, Cluster B, and Deputy City Manager & Chief Financial Officer and the appropriate officials to report as part of the 2017 Capital Budget process on funding for delivery of the implementation strategy for the proposed Gardiner East EA public realm improvements;

6. City Council direct the Chief Planner and Executive Director of City Planning (in partnership with Waterfront Toronto) to report to Toronto and East York Community Council after Gardiner East EA approval by the Ontario Minister of Environment and Climate Change on a process to review the Keating Channel Precinct Plan; and

7. City Council direct the General Manager of Transportation Services to undertake an in-depth safety review of the Jarvis Street and Lake Shore Boulevard intersection, and report to Public Works and Infrastructure Committee by Q4 of 2016 on improvements that can be made as part of detailed design and implementation of the Gardiner Strategic Plan, or through other projects and initiatives.

FINANCIAL IMPACT

i) Business Case Decision Making (Discounted Cash Flow Analysis – Net Present Value)

Following PWIC direction in September 2015, the project team has advanced three alternative versions of the Council-preferred Hybrid concept to a level of detail necessary to support the analysis and selection of a final Preferred Design. The three more advanced Hybrid Alternative Designs are summarized as follows:

- Hybrid 1: Revised Hybrid with tighter ramps in the Keating Channel Precinct;
- Hybrid 2: New Hybrid with alignment further north; and
- Hybrid 3: New Hybrid with alignment further north and rail bridge underpass widening.

Capital cost estimates for each of the three Hybrid alternatives were developed along with longer term lifecycle costs for capital replacement over a 100-year time frame based on 2013$ for comparison and evaluation purposes, as reflected in Figure 3 below.

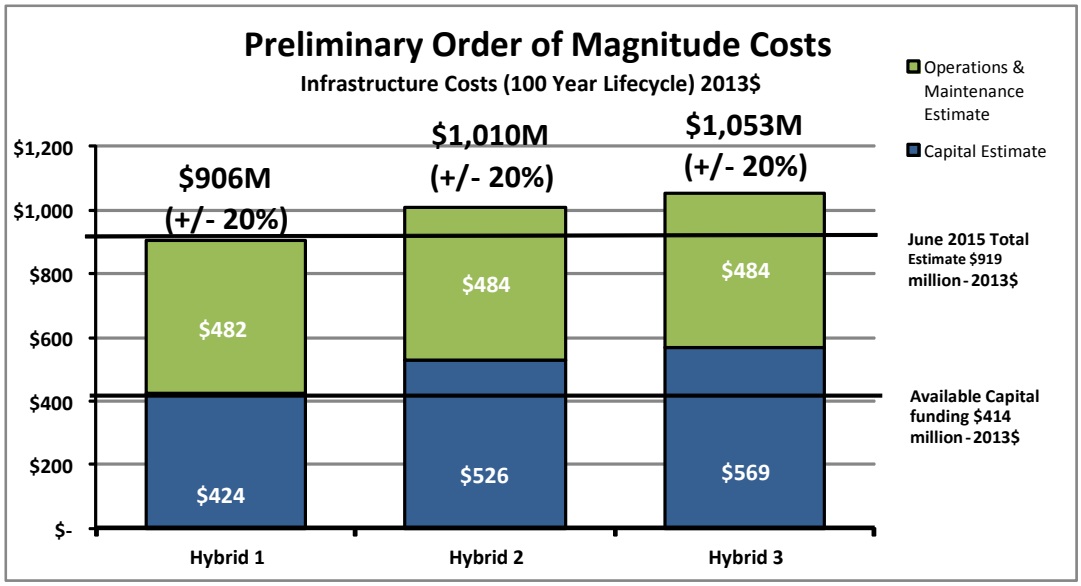

Figure 3: Source – Project Engineering Consultants – Morrison Hershfield, Peer Reviewed by Altus

Due to the long timeframe and variances in costs and timing of capital features amongst alternatives when expressed in 2013$ over a 100 year period, a discounted cash flow analysis was prepared based on the 2013$ information, with all figures represented in a NPV in current dollars for comparison and evaluation purposes. To determine the NPV, a real discount rate of 4% was used for calculations.

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. Based on a fiscal net benefit analysis, as demonstrated in the table below, Hybrid 1 was determined to be the lowest cost alternative on an NPV basis over a 100-year timeframe, reflecting an estimated lifecycle infrastructure capital cost at $339 million NPV ($906 M in 2013$). Hybrid 2 has the second lowest estimated lifecycle infrastructure capital cost at $414 million NPV ($1.010 billion in 2013$) while Hybrid 3 has the highest estimated lifecycle infrastructure capital cost of $445 million NPV ($1.053 billion in 2013$).

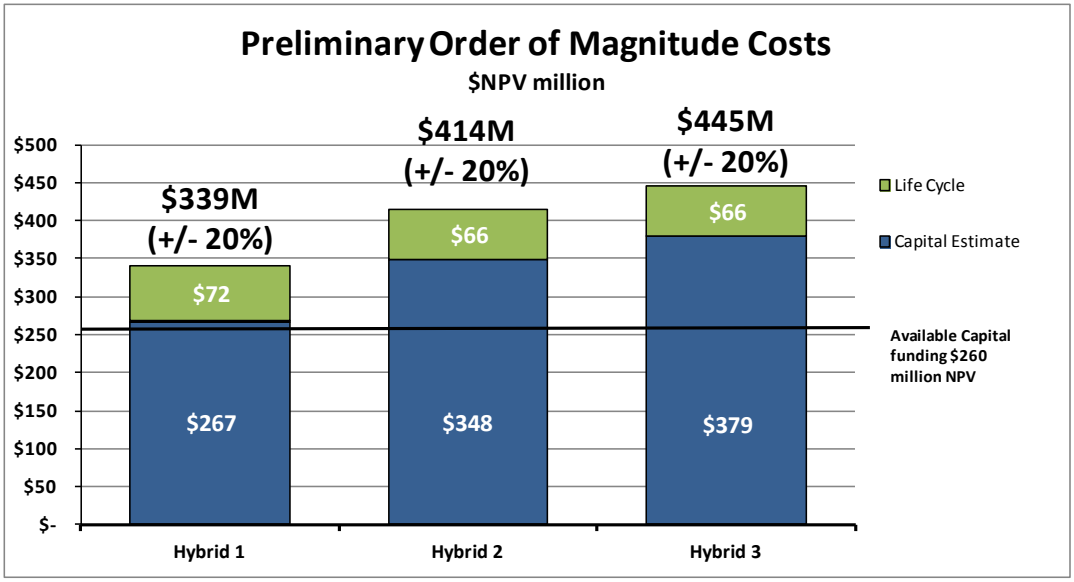

Figure 4: Source – Project Engineering Consultants – Morrison Hershfield, Peer Reviewed by Altus

Note: Net present value (NPV) represents the sum of the present values of future capital expenditures, in this case for each of the 'Hybrid' alternatives. It is one of the most reliable measures used in project decision making as it accounts for time value of money. Some options may have higher initial costs but will realize longer term savings into the future and vice versa. The NPV analysis properly accounts for such variations over time and brings future costs back to an appropriate current cost so as to compare alternatives along the same basis

ii) Budgetary Impact (Inflated Dollars Required for Construction)

While a discounted cash flow analysis is an effective decision making tool for evaluating different options, for budgeting and financing purposes, the actual construction costs need to be inflated to the year of proposed construction. These costs can then be considered within the City's capacity to fund as part of establishing the 10-Year Capital Budget and Plan.

To determine the estimated capital costs in inflated "as spent dollars" the estimates provided in 2013$ have been cash flowed over the years that spending is anticipated to occur, with an annual construction inflation factor of 2.5% applied.

Transportation Services' 2016 to 2025 Capital Budget and Plan includes capital funding of $2.259 billion over the 10-year period for the construction costs associated with the Gardiner Strategic Plan for the entire length of the expressway. When considering the

total project costs including cost estimates beyond the 10-year planning period, the total project cost estimate for the rehabilitation is currently $2.6 billion.

Of the total project cost estimates for which funding is already in place, $524 million has been included for the Hybrid base case alternative. Within all Hybrid alternatives, additional capital funding is necessary, additional capital construction funding is estimated at $8 million for Hybrid 1, $140 million for Hybrid 2, and $194 million for Hybrid 3.

Figure 5 below illustrates the estimated budgetary impacts of the construction costs for three Hybrid alternatives above the base level of planned funding for the Gardiner Strategic Plan.

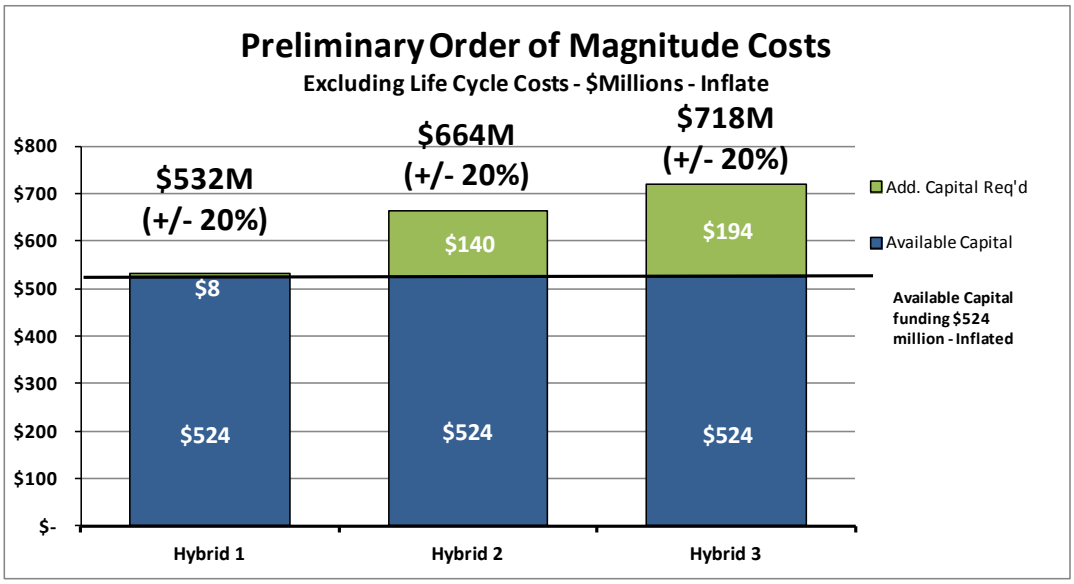

Figure 5: Source – Project Engineering Consultants – Morrison Hershfield, Peer Reviewed by Altus

Public Realm Improvement Costs

In addition to the construction costs noted above, the integrated urban design component of the Gardiner East EA has recommended a number of public realm improvements East of Jarvis, with preliminary cost estimates provided by the consulting team identified as follows:

- Hybrid 1: $71 million (+/- 20% in 2013$);
- Hybrid 2: $60 million (+/- 20% in 2013$); and
- Hybrid 3: $60 million (+/- 20% in 2013$).

These costs are not included within the Gardiner East construction cost estimates. An implementation strategy is needed to identify how proposed public realm improvements can best be coordinated between the Gardiner Strategic Plan and the other City initiatives. Given the different implementation timeframes of the longer list of area initiatives, a phasing plan will be generated as part of the implementation strategy. In addition, the implementation strategy will explore opportunities for cost sharing between the Gardiner Strategic Plan, other City initiatives and programs and private land owners/developers.

iii) Order of Magnitude Cost Estimates

Costs for the Hybrid alternatives outlined in this report represent order-of-magnitude costs for comparative purposes only. These costs were based on conceptual designs only and may have a significant margin of error.

These cost estimates have not taken into consideration conflicts and constraints with respect to environmental and utility issues. Staff are in the process of obtaining more refined cost estimates (Class C) which may identify additional requirements.

In keeping with the consulting team's expressed variance of plus or minus 20%, it is recommended that staff report on final cost estimates following Council's approval of a Preferred Design, incorporating the results of the forthcoming Class C estimates.

iv) Budget Adjustment

Subject to Council approval of a Preferred Design, the Deputy City Manager & Chief Financial Officer will report to Budget Committee on a detailed financing strategy following receipt of the Class C capital cost estimates. This report will consider the City's conventional method for financing capital projects that is by way of issuance of debenture debt.

Assuming 30-year debenture debt is applied to finance these preliminary estimates (Hybrid 3 - $194 million above current funding), additional annual debt servicing payments are estimated in the amount of $14 million over 30 years (+/- 20%).

These debt charges would be funded primarily through the tax base. Various other sources of funding will be explored to minimize the tax impact of servicing the required debt. Funding sources that will be explored and reported back on may include, but would not be limited to:

- Proceeds from future land sales;
- Potential for increased Federal and/or Provincial funding based on the increased construction costs;

- Proceeds from eligible development charges that may be applied to certain aspects of the project, such as the Lake Shore Boulevard Realignment and Don Bridge that are included in the City-Wide DC By-law; and
- Potential of utilizing new revenue tools, including road tolls.

The Deputy City Manager & Chief Financial Officer has reviewed this report and agrees with the financial impact information.

DECISION HISTORY

Prior Council Direction

This report is focused on the work completed since City Council's June 2015 direction to proceed with the Hybrid as the Preferred Solution for the Gardiner Expressway and Lake Shore Boulevard East Reconfiguration Environmental Assessment and Integrated Urban Design Study.

A comprehensive decision history on the Gardiner Expressway's role relative to transportation planning and waterfront revitalization within the City of Toronto was provided in the May 6, 2015 report "Gardiner Expressway and Lake Shore Boulevard East Reconfiguration Environmental Assessment (EA) and Integrated Urban Design Study – Updated Evaluation of Alternatives" to Public Works and Infrastructure Committee. See PW4.1 at:
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW4.1

June 2015 Council Direction

At its June 10-12, 2015 meeting, City Council endorsed the Hybrid as the Gardiner East EA Preferred Solution in considering the report "Gardiner Expressway and Lake Shore Boulevard East Reconfiguration Environmental Assessment and Integrated Urban Design Study – Updated Evaluation of Alternatives (PW4.1)," as well as the Supplementary Report (PW4.1.a). See PW4.1 at:
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW4.1

In so doing, Council authorized staff, amongst other directions, to:

- Further develop and evaluate alternative Hybrid design concepts for the EA Preferred Solution, including the further investigation of options to mitigate negative impacts and all required public consultation; and

- Report to the September 22, 2015 meeting of Public Works and Infrastructure Committee on various design options for the Hybrid alignment of the DVP and Gardiner Expressway East, including an assessment of the following implications:

    - Degree of turns;
    - Speed of vehicles on turning point;
    - All associated costs;
    - Construction feasibility; and
    - Impact on development potential in the area.

September 2015 PWIC Direction

Per City Council's June 2015 direction, staff presented a September 10, 2015 "Progress Report on Design Concepts for the Hybrid EA Preferred Alternative" at a meeting of the Public Works and Infrastructure Committee meeting on September 22, 2015.
See PW7.2 at:
http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW7.2

The three more advanced Hybrid design concepts presented at that time were:

- Hybrid 1: Revised Hybrid with tighter ramps in the Keating Channel Precinct;
- Hybrid 2: New Hybrid with alignment further north; and
- Hybrid 3: New Hybrid with alignment further north and rail bridge underpass widening.

The advancement from one original June 2015 Hybrid design concept to three detailed Hybrid Alternative Designs was informed by proposals from community members and landowners, as well as by meetings with the project Stakeholder Advisory Committee (SAC), agencies, academics, developers and other stakeholders.

In addition to a staff presentation on these three Hybrid Alternative Designs, the Public Works and Infrastructure Committee received deputations on two third-party proposals (the "Green Gardiner" and the "Viaduct") describing alternate visions for the future of the Gardiner Expressway. Both concepts explore alternative approaches to minimize the physical footprint, maintenance costs, and visual impacts associated with reconstructing an elevated expressway, while improving public access to the water's edge and maximizing opportunities for high-quality neighbourhood planning and development.

The Public Works and Infrastructure Committee voted to receive this item for information. The accompanying September 10, 2015 staff report described the following work program:

- Consider comments from deputants and debate during the September 22, 2015 Public Works and Infrastructure Committee meeting for incorporation into further development and evaluation of the three Hybrid Alternative Design concepts;

- Develop public realm strategies for each Hybrid alternative, divided into the three distinct sections (east of the Don River; between the Don River and Cherry Street where the Preferred Design will be implemented; and west of Cherry Street to Jarvis Street) that make up the EA study area. Each public realm strategy should lead to corridor intersection and streetscape improvements that benefit pedestrian and cycling safety, and reinforce the EA and waterfront revitalization goals;
- Undertake a detailed evaluation of each Hybrid alternative according to the various criteria groups previously approved as part of the EA Terms of Reference, as well as the objectives of the City's Official Plan and Central Waterfront Secondary Plan;
- Undertake further evaluation of the third-party proposals as part of the EA study process;
- Present draft alternative designs and evaluation results to the EA Stakeholder Advisory Committee, stakeholders and landowners, followed by a presentation at a Public Information Centre; and
- A preferred recommended design will be submitted to Committee and Council in early 2016.

ISSUE BACKGROUND

Gardiner History

The F.G. Gardiner Expressway is a six-lane controlled access highway built between 1955 and 1966 that extends approximately 18 kilometres from Highway 427 to east of the DVP. Seven kilometres of the Gardiner is elevated, 2.4 kilometres of which comprise the Gardiner East EA study area.

The Gardiner was connected to the DVP in 1964, and since that time there have been proposals of various kinds to take down all or part of the elevated Gardiner Expressway structure. These proposals started to gain credence as the lands adjacent to the central section of the expressway began to transition from heavy industry, warehouse and freight rail uses to more intense employment and residential uses. With these changes in the character of the corridor came increasing demands to re-establish connections between the city and the lake.

After decades of uncertainty and numerous costly studies on the future of the Gardiner/Lake Shore corridor, it is necessary for the City to reach a final decision with respect to the east end of the corridor which is in urgent need of rehabilitation and holds considerable potential for redevelopment and positive change. Realization of the full benefits of this transition to more intense employment and residential uses requires agreement and decisive action on the future configuration of the area’s two major roads, the Gardiner Expressway and Lake Shore Boulevard East.

EA Purpose of Undertaking & Terms of Reference

Purpose of the Undertaking

The Purpose of the Undertaking for the Gardiner EA is to address current problems and opportunities in the Gardiner-Lake Shore Boulevard east corridor. Key problems include a deteriorated expressway that needs major repairs, as well as a waterfront that is disconnected from the city. Strategic opportunities presented by a new alignment of the expressway include revitalizing the waterfront through the creation of new development blocks, buildings, neighbourhood streets, and a new public realm.

The EA consultant team has been led by Dillon Consulting Limited (Dillon), supported by Morrison Hershfield, Perkins + Will, Hargreaves Associates, HR&A, Archaeological Services Inc., CPCS, and Cushman and Wakefield.

The EA has been directed by a joint City and Waterfront Toronto Steering Committee co-chaired by the Deputy City Manager responsible for the Waterfront Initiative and Waterfront Toronto's President and Chief Executive Officer. The Committee has been supported by a City and Waterfront Toronto project team consisting of Project Managers from Waterfront Toronto, Transportation Services, and City Planning. A Technical Advisory Committee has also reported to the project team.

2009 Terms of Reference

The Terms of Reference for the Gardiner East EA were approved by City Council and the Minister of the Environment in 2009. The approved EA Study Process consists of six individual phases as listed below:

- Phase One: Identify Problem & Opportunity;
- Phase Two: Develop Project Goals;
- Phase Three: Describe Baseline Conditions;
- Phase Four: Evaluate & Select Preferred Solution;
- Phase Five: Evaluate & Select Preferred Design; and
- Phase Six: Prepare & Submit EA Document.

As previously noted, Phase Four concluded with a June 2015 Toronto City Council endorsement of the Hybrid concept as a Preferred Solution. This staff report summarizes the work completed in the EA study's fifth phase, including the development of three Alternative Designs for the Hybrid, and the evaluation of each Alternative Design using previously approved criteria. Upon the conclusion of Phase Five with the selection of a Preferred Design by City Council, the final EA document would be finalized and submitted for public and MOECC review, and final approval.

Public and Stakeholder Consultation Process

The Gardiner East EA has been conducted in an open and publicly accessible manner in accordance with the Environmental Assessment Act. With the assistance of LURA Consulting as Independent Facilitator, the process featured public forums, Stakeholder Advisory Committee (SAC) meetings, Technical Advisory Committee meetings, Aboriginal community engagement, and meetings with government agencies, landowners, business groups, developers and other affected parties.

In this fifth phase of work, SAC meetings were held on July 21, 2015, September 1, 2015, November 20, 2015, and January 14, 2016 following Council endorsement of the Hybrid as the preferred EA alternative in June 2015. Meetings were also held with Metrolinx, Toronto and Region Conservation Authority (TRCA), developers First Gulf and Castlepoint Numa, academics, planners, and the teams that developed the third-party proposals.

Public and stakeholder input influenced the development of the three Hybrid Alternative Designs, and the emergence of Hybrid 3 as the Preferred Design of the project team. Direction included:

- The need to move infrastructure as far north as possible in the Keating Channel Precinct in order to maximize opportunities for development and open space along the Keating Channel;
- Appreciation of the opportunity to widen the Metrolinx Don River/DVP rail bridge underpass to enable a tighter turning radius for the Gardiner–DVP ramps;
- Concern about how Gardiner vehicle drivers will respond to the slower design speed ramps proposed for two of the alternative design concepts;
- Divided opinion regarding whether Lake Shore Boulevard is best placed beneath or adjacent to the new expressway link, and the impact this would have on the objective of making Lake Shore Boulevard a two-sided street, as per the Keating Channel Precinct Plan;
- Concerns about the location and need for new on/off ramps in the Keating Channel Precinct, and their impact on the role of Cherry Street as a key gateway to the Port Lands;
- Integration of public realm improvements with the Gardiner East EA Preferred Solution; and
- Concerns with pedestrian and cyclist safety at the intersection of Jarvis Street and Lake Shore Boulevard, and the desire for a more detailed analysis of possible road design improvements at this location.

A Public Information Centre meeting was held on January 19, 2016, the purpose of which was to obtain feedback on the evaluation of Alternative Designs for the Hybrid option and the urban design concepts for the study area. In comparing the three Alternative Designs and associated public realm plans, most participants expressed support for either Hybrid 2 or 3, with Hybrid 3 receiving the most positive feedback. The benefits of Hybrid 3 identified by participants included (amongst others) moving the expressway

alignment further north, adjacent to the railway corridor; releasing public land on the north side of the Keating Channel for other uses (e.g., development, public space, etc.); and improving public access to the waterfront, particularly in terms of north-south connectivity. Very little support was expressed for Hybrid 1. Hybrid 2 was strongly preferred over Hybrid 1, but not as preferred as Hybrid 3. A detailed summary of the final round of stakeholder consultation results is provided in Appendix 4: Round Five Consultation Report by LURA Consulting (February 2016).

Next Stages in EA Process

MOECC Submission, Review and Approval Process

Prior to submitting the final EA report to the MOECC, City and Waterfront Toronto staff will release the draft EA Report for public stakeholder and MOECC review. While the release of a draft EA report is not a requirement, it is recommended by the MOECC to ensure that any remaining concerns or technical issues are identified and addressed before the final EA report submission is made to the MOECC.

Though a final decision by the Minister of the Environment and Climate Change on an Environmental Assessment report can take from approximately eight months to several years from the date of EA report submission, the project team has maintained regular communication with senior MOECC personnel throughout the study process to minimize possible future delays. The MOECC's EA review and approval decision process involves opportunities for government agencies, interested persons and Aboriginal communities to review the EA Report (within a 45-day commenting period), and submit their comments directly to the MOECC. City and Waterfront Toronto staff will have an opportunity to review comments received and advise the MOECC on the issues raised and how they have been addressed during the EA process or how they can be addressed as part of future processes such as during detailed design.

At the completion of its review process, MOECC staff will prepare recommendations for the Minister of the Environment. Under the Environmental Assessment Act, the Minister may:

- Approve the undertaking;
- Approve the undertaking with conditions; or
- Refuse to give approval of the undertaking.

Before making a decision, the Minister may also refer the EA or a specific issue to the Environmental Review Tribunal or to mediation. Cabinet concurrence with the Minister's decision may also be required. Furthermore, additional time may be required if an appeal is filed or a legal challenge is made. If approval to proceed with the undertaking is given, a signed Notice of Approval (with or without conditions) and an Order-in-Council would be provided.

Modifications During the EA Process

The alternative Hybrid designs have been developed at a concept level of detail to facilitate their comparative evaluation and to identify potential environmental effects. Changes to some of the project components may be required or desirable as a result of future detailed design work being undertaken and/or changes to the project area. Changes to the project might be required due to:

- More detailed baseline information that may become available as part of detailed design (e.g. soil and groundwater conditions);
- Required or preferred facility design changes that may become apparent during the facility detailed design;
- The advancement in the design of other infrastructure and land development projects in the local project area that may, for example, allow for further project benefits to be realized;
- Issues emerging from the approvals of other projects in the study area;
- Completion of other studies (e.g. Don River flood conveyance modelling) that necessitate changes in the design of the preferred Hybrid design;
- Conditions encountered during construction (e.g., an unexpected encounter with archaeological resources);
- The emergence and use of new technology or construction processes that could result in a reduction in environmental effects and/or project costs or construction timelines; and
- Design changes required to accommodate other permits or approvals and/or changes to the regulatory process.

To accommodate changes to the Preferred Design, whether required and/or desirable, the EA Report will include amendment procedures that set out a process to be followed to accommodate the project changes. This process will include procedures to accommodate what are considered to be Minor Changes and Major Changes. The procedures will outline how the MOECC, the public and other stakeholders are to be informed and consulted about the project changes.

Other Approvals and Feedback Required

In July 2010, Council deferred approval of the Keating Channel Precinct Plan and the Keating Channel Class EA Environmental Study Report as they relate to lands east of Cherry Street until the conclusion of the Gardiner East EA. Subsequently, Council directed in June 2015 that, after Gardiner East Environmental Assessment approval by the MOECC, City staff in partnership with Waterfront Toronto undertake a review of the Keating Channel Precinct Plan as it relates to lands east of Cherry Street. The review of the Keating Channel Precinct Plan affords an opportunity to develop the Gardiner East EA public realm strategies (east of Cherry Street) in greater detail, including the size and location of future public open spaces, streetscape character, and phasing/implementation. An update of the June 2015 Council action directing a review of the Keating Channel Precinct Plan has been included in the recommendations section of this report.

In order to address stakeholder concerns regarding the location and impacts of new on/off ramps within the Keating Channel Precinct, SAC members will be invited to review and provide feedback on preliminary ramp designs in the detailed design stage of the project.

COMMENTS

1. Hybrid Alternative Design Development

This section of the report describes a number of issues that were considered in the development of the Hybrid Alternative Designs. It begins with an overview of road safety and traffic modelling/travel time considerations, and outlines a number of important existing and future physical constraints within and adjacent to the Keating Channel Precinct. Finally, it provides an overview of the third-party proposals presented to Public Works and Infrastructure Committee, and a summary of the evaluation conducted for each third-party proposal.

1.1 Road Safety Design and Traffic Modelling

Gardiner–DVP Ramp Design Speeds

The DVP and Gardiner Expressway both have a design speed of approximately 110km/h with a posted speed limit of 90km/h. The existing two-lane, directional ramps connecting these two highways have a design speed of 80km/h, with a posted, advisory speed limit of 60km/h. Posted highway speeds are generally 10 to 20km/h below road design speeds. It is also normal for higher speed directional ramps to have posted speeds of 20km/h lower than the connecting highway posted speeds. As such, 70km/h could be a driver's general expectation of the posted speed limit on the Gardiner–DVP ramps. The existing ramps have been posted at 60km/h due to the design elements of this structure, including the horizontal curvature and the absence of shoulders, which contribute to sightline restrictions.

When the Hybrid Alternative Solution was originally developed and investigated in response to PWIC's March 2014 direction, a key operational desire for the alternative was the maintenance of a safe expressway link between the DVP and the Gardiner, and the minimization of any travel time impacts. Through development of the Hybrid Alternative Designs, the alignment of the Gardiner–DVP ramps was revisited to explore whether new ramps under a more northern alignment could be safely designed while maintaining travel times. Hybrids 2 and 3 make use of lower design speed ramps in order to achieve the tighter ramp radii that permit a more northern alignment of the Gardiner through the Keating Channel Precinct.

The lower design speeds and tighter ramp radii used by the project team in developing Hybrids 2 and 3 were additionally reviewed by AECOM, an independent third-party engineering firm. Based on the results of AECOM's Gardiner EA Road Safety Audit

Report, revisions were made to the design of the ramps, including widening to provide shoulders. Further recommendations on signage and lane markings can be addressed during detailed design.

1.2 Hybrid Traffic Model Forecasting

Each of the Hybrid Alternative Designs would result in similar road capacities and travel times so traffic modelling was only undertaken for the Hybrid alternative to confirm the need for new Gardiner-Lake Shore Boulevard access ramps (at Cherry Street) to compensate (from a traffic capacity and safety perspective) for the removal of the Logan ramps.

This modelling demonstrated that the removal of the Logan ramps (proposed in each of the Hybrid Alternative Designs) would require new eastbound off-ramps and westbound on-ramps. Without these new ramps, eastbound traffic headed east of the Don River and westbound traffic on Lake Shore Boulevard approaching the Don River would need to utilise Lake Shore Boulevard instead of the Gardiner. This would put significant pressure on Lake Shore Boulevard and result in the Gardiner being underutilized with longer vehicle travel times for some trips. Due to space restrictions in the corridor, the only viable location for these new ramps would be just east of Cherry Street in the Keating Channel Precinct.

The project team considered whether Hybrids 2 and 3, with their tighter ramps and slower posted travel speeds, would impact travel times relative to Hybrid 1. Informed by the consultant's transportation modelling experts, the team concluded that there would be negligible difference between the three Hybrid Alternative Designs.

1.3 Physical Design Constraints & Considerations

The following section summarizes a number of existing and future physical constraints that were considered in developing the Hybrid Alternative Designs. In each alternative design, these items exerted influence on the location, geometry and design of the future Gardiner Expressway and Lake Shore Boulevard within and adjacent to the Keating Channel Precinct.

Metrolinx Don Rail Bridge: The Metrolinx rail bridge over the Don River and DVP has limited space for additional roadway infrastructure beneath, and the location of the existing bridge support piers (and their width) limit opportunity for lane reconfiguration through the underpass. Without the widening of this underpass, the rail bridge serves as a control point for the DVP ramp design/radius and requires an alignment closer to the Keating Channel. The potential to widen the rail bridge underpass was explored as part of the EA study in order to allow the more northern alignment of a new Gardiner-DVP ramp associated with Hybrid 3.

Don Roadway: The Don Roadway facilitates direct access between the DVP and Lake Shore Boulevard. The importance of this link is expected to increase with further Port Lands and South of Eastern development. Capacity of this roadway is limited and physically constrained by the Don River and the Metrolinx Don Rail bridge.

Stormwater Management Facility: A stormwater management facility and sanitary pumping station is being constructed to serve the West Don Lands and East Bayfront. The facility includes two underground shafts (that have been constructed) and a building to house needed equipment. The building design is currently proposed at a height of about 13 metres, similar to the height of the Gardiner deck.

Planned Don Roadway Sediment Control Facility: As part of the plan to re-naturalize the mouth of the Don River, a sediment control management facility will be located on the west bank of the river north of Lake Shore Boulevard. Details regarding how the facility would be developed and operated will emerge through the detailed design for Port Lands flood protection. The design of new Gardiner–DVP ramps needs to accommodate this facility and associated operations. While spanning of the facility is possible, a Hybrid design which minimizes potential for conflict, and maintains minimum vertical clearances, is preferred.

TPLC Wilson Yard and Rail Lead: The Wilson Rail Yard (on the west side of the Don River south of the Metrolinx Don Rail Yard) and rail lead line into the Port Lands were spatial constraints for the design of the Hybrid Alterative Designs.

Alignment with the Keating Channel Precinct Plan: This partially approved plan provides the urban design and land use framework for the Keating Channel Precinct to evolve as a gateway connection between the Port Lands and the Central Waterfront, with a mixed-use waterfront neighbourhood at its core located alongside a newly accessible and revitalized Keating Channel. In any configuration, an elevated Gardiner Expressway and re-aligned Lakeshore Boulevard will have a significant influence on the street, block and open space structure of this future neighbourhood.

1.4 Third-Party Proposal Overview

While developing the Hybrid design concepts, the project team received unsolicited proposals from stakeholders and community members. In particular, two third-party proposals – the 'Green Gardiner' and the 'Viaduct' - were submitted to the project team during the Hybrid Alternative Design stage.

Initially, both of these third-party concepts explored alternative alignments for the Gardiner Expressway between Jarvis Street and the Don River. Through meetings with the project team, the various physical design constraints of the Keating Channel Precinct were brought to bear on each concept. Furthermore, emergent details of Hybrid 2 and 3 were shared with the authors of the third-party proposals, and were generally found to support a common objective of pushing the Gardiner alignment as far north from the

water's edge as is feasible. As a result, the focus of both third-party proposals shifted west of Cherry Street, and were re-envisioned to maintain compatibility with Hybrids 2 and 3.

Summarized briefly below, these two concepts were described in greater detail in the staff report to Public Works and Infrastructure Committee (PWIC) on September 22, 2015. As outlined in the report, the City committed to the further consideration and examination of these concepts. See PW7.2 at: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2015.PW7.2

The Green Gardiner Proposal

The Green Gardiner concept was developed and submitted by a team of consultants including BrookMcIlroy, SvN and Entuitive. The proposal calls for the consolidation of railway and highway infrastructure, with surplus lands in the road right-of-way being used for land development. Specifically, the Gardiner between Yonge Street and Cherry Street would be stacked above the rail corridor with new development located on surplus City owned right-of-way located south of the rail corridor. Lake Shore Boulevard would then be free of the elevated expressway and be developed as a landscaped six-lane roadway with development on both sides. To preserve westbound traffic access to Sherbourne and Jarvis Streets, a westbound exit ramp in the Keating Channel Precinct was added to the concept. The concept also provided for the possibility of linear open/green space supported on a platform above the expressway lands.

The Viaduct Proposal

The Viaduct concept was submitted by a team of consultants including Robert E. Millward, David Dennis Design, DTAH and Paul Bedford. The original proposal called for the Gardiner Expressway to be reconstructed on a new berm located south of the rail lands between Jarvis Street and Munition Street. It was proposed that the height of the expressway would be similar to the rail berm. Part of the rationale for supporting the expressway with a berm was to reduce long-term maintenance costs. A fully landscaped Lake Shore Boulevard would run parallel to, rather than beneath, the expressway to the south. In addition, new Gardiner–DVP ramps would be constructed over the east-west Metrolinx Don rail bridge.

After reviewing this concept further with the Gardiner project team, the Viaduct concept was revised to extend west of Cherry Street only, as east of Cherry Street it would need to transition to an elevated structure in order to cross the Don River with an appropriate turning radii. Additional considerations included avoiding impact to the partially constructed City stormwater management facility located immediately east of Cherry Street/south of the rail corridor, and avoiding impact to the approved Don Mouth Sediment Management Facility. Upon further review of the concept, it was also determined that a full viaduct with Lake Shore Boulevard running south of a berm supported expressway would require significant private land as the existing right-of-way is not wide enough to accommodate a full berm/parallel Lake Shore Boulevard

configuration. To reduce private property requirements, the Viaduct was revised by assuming that portions of the elevated expressway would be supported by a "bridge structure" allowing sections of Lake Shore Boulevard to be placed under the elevated expressway. The only section of the expressway that could reasonably be placed on a berm with LSB located immediately to the south, without significant property requirements, was between Sherbourne Street and Parliament Street (about a 425 m section).

Conclusion of Third-Party Proposal Review

The Viaduct and Green Gardiner concepts were received, refined and assessed by the Gardiner project team. This included a review of the concepts with respect to their transportation functionality, city building benefits, costs, potential impacts, and approval and construction timelines. The specific work undertaken by the study team to review these third-party concepts involved the following:

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

The project team concluded that neither third-party proposal is achievable within the lifespan of the current elevated Gardiner East structure, since design and approvals could not be secured in time for the City to take action on the elevated Gardiner East by 2020.

For the Green Gardiner concept, Metrolinx has advised the project team that the proposal cannot be entertained while Metrolinx defines their planning and growth needs for the rail corridor. Until such time as Metrolinx's long term needs for the corridor are determined, it is not possible to support placement of any road-related infrastructure in the rail corridor that may impact future rail expansion plans, including the Regional Express Rail (RER) program. For the Viaduct concept, land acquisition requirements would delay design and approvals for several years.

For both proposals, lengthy approvals would mean that the City would have to proceed with the planned rehabilitation of the Gardiner East deck through the Gardiner Strategic

Plan. This rehabilitation work would then be negated if the City were to pursue either proposal after implementation of the Gardiner Strategic Plan. In addition to this wasted expenditure, both proposals would be expensive to implement. In the case of the Green Gardiner proposal, implementation was estimated at approximately $735 million (2013$) in addition to the cost of implementing the preferred Hybrid, although this cost would be offset by approximately $130 million to $145 million in development revenues. For the Viaduct proposal, implementation was estimated at approximately $485 million (2013$) in addition to the cost of implementing the preferred Hybrid.

For the Green Gardiner proposal, while it would create 1.1-kilometres of open-air Lake Shore Boulevard with two-sided development, as well as provide the potential for new open space over the expressway deck, implementation of the proposal could generate neighbourhood noise, air quality and view impacts.

For the Viaduct proposal, while it would create a section of bermed expressway with an open air Lake Shore Boulevard from Sherbourne Street to Parliament Street, only 425 metres of viaduct is possible over a 1.7-kilometre distance (the rest would remain elevated structure with the Gardiner on top of Lake Shore Boulevard for long stretches. Implementation of the proposal would affect 12 private properties (with acquisition costs of approximately $45 to $50 million (2013$) and lengthen pedestrian crossing distances at some north-south streets.

While the project team's evaluation of the proposals will be fully documented in the final EA report, no further study of either the of third-party proposals is recommended as part of the Gardiner East EA. Notwithstanding this, the project team acknowledges the role of the proponents of the third-party proposals in assisting with the Alternative Designs process.

2. Description of the Hybrid Alternative Designs

Consistent with a June 2015 Council direction that staff develop and evaluate Alternative Designs of the preferred Hybrid solution, each of the three Hybrid Alternative Designs maintain key distinguishing features of the initial Hybrid concept. These key features include retention of a continuous expressway linkage to the DVP, removal of the existing Logan on/off ramps, re-alignment of Lake Shore Boulevard from Cherry Street to Don River and construction of a new multi-use pathway.

In order to clearly distinguish commonalities versus differences between each of the Hybrid Alternative Designs, this section of the report begins with identifying the elements that are common to each alternative design, i.e., those elements that will be included regardless of the decision on a Preferred Design.

The description of common elements is followed by a description of the road design and features that are unique to each of the Hybrid Alternative Designs, i.e., those elements that distinguish each Hybrid option from the other.

2.1 Common Design Elements

The three design alternatives are all similar within the westernmost segment of the Gardiner East EA study area, i.e., the segment between Lower Jarvis Street, and Cherry Street. The common design elements of each alternative Hybrid design within this westernmost segment of the study area include:

- Rehabilitation of the Gardiner East deck;
- Retention of the existing Gardiner structure/ramps west of Cherry Street;
- Retention of existing Lake Shore Boulevard;
- Pedestrian and cyclist-related improvements to the Lake Shore Boulevard and Lower Jarvis Street, Sherbourne Street, Parliament Street and Cherry Street intersections; and
- Extension of a multi-use pathway along north side of Lake Shore Boulevard.

Similarly, within the easternmost segment of the Gardiner East EA study area - from Don Roadway to Leslie Street - there are no substantial differences among the three Hybrid Alternative Designs. The common elements of each alternative design within the eastern study area segment are as follows:

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

The primary focus of the alternative designs is the middle segment of the Gardiner East EA study area, from Cherry Street to the Don River/DVP. Three Alternative Designs were developed, all with a number of common design elements:

- Preservation of a continuous Gardiner-DVP freeway connection, with similar peak period origin-destination auto travel times to those previously reported for the initial Hybrid concept in June 2015;
- Replacement of the existing Logan on/off ramps with new ramps in the Keating Channel Precinct;
- Re-alignment of Lake Shore Boulevard through the Keating Channel Precinct;
- Accommodation of future surface street connections (e.g. Queens Quay and Munition Street) to provide needed access to neighbouring communities and waterfront destinations (note: implementation of both street connections are outside the scope of work for the Gardiner East EA); and
- Full compatibility with the Gardiner Strategic Plan (west of Cherry Street).

2.2 Hybrid Alternative Design 1: Road Design and Features

The configuration of Hybrid 1 (See Figure 6 below) is most similar to the Hybrid Preferred Solution endorsed by City Council in June 2015. It most closely resembles the current configuration of the Gardiner within the Keating Channel Precinct, and current ramp connections between the Gardiner and DVP. The distinguishing road design and features of Hybrid 1 are as follows:

- The existing Gardiner structure would be re-decked (as opposed to demolished and reconstructed further north as per Hybrids 2 and 3);
- The existing DVP ramps would be re-decked and maintained in their current locations;
- Two new Lake Shore Boulevard on/off ramps within the Keating Channel Precinct would be located outside the footprint of the existing elevated expressway;
- New approach roads would be constructed to connect the new on/off Gardiner ramps running under or beside the elevated Gardiner, adjacent to the Keating Channel, to Lake Shore Boulevard;
- Lake Shore Boulevard would become the primary street address for a new double-loaded development corridor; and
- Though not part of the Gardiner East EA, Hybrid 1 would allow for Queens Quay to be extended and curve north to intersect with Lake Shore Boulevard approximately 100m east of Cherry Street.

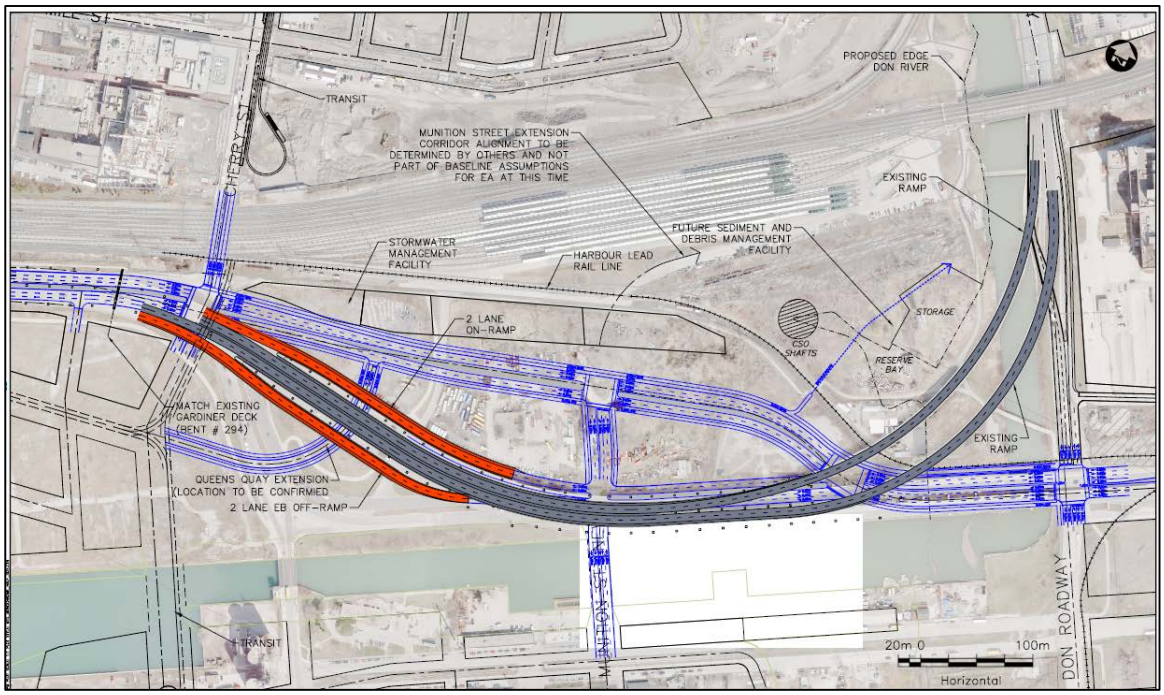

Figure 6: Hybrid Alternative Design 1

2.3 Hybrid Alternative Design 2: Road Design and Features

Compared to the Hybrid Preferred Solution endorsed by City Council in June 2015, Hybrid 2 (see Figure 7 below) features a more northerly alignment of the Gardiner Expressway east of Cherry Street, and therefore a more northerly location of the Gardiner/DVP ramps. The distinguishing road design and features of Hybrid 2 are as follows:

- The existing expressway connection would be demolished and rebuilt to run through the Keating Channel Precinct further north (than Hybrid 1), away from the Keating Channel edge;
- New "tighter" ramp connections (compared to Hybrid 1) to the DVP would be constructed;
- New westbound on and eastbound off (both 2 lanes) Lake Shore Boulevard-Gardiner ramp connections would be constructed east of Cherry Street to connect with a planned Munition Street extension;
- Lake Shore Boulevard would run along the northern edge of future development blocks within the Keating Channel Precinct;
- The new Lake Shore Boulevard on/off ramps within the Keating Channel Precinct would be located in the middle of the expressway lanes (as opposed to outside the expressway lanes in Hybrid 1); and
- Though not part of the Gardiner East EA, the eastern terminus of the Queens Quay extension would include a new intersection with the Munition Street extension. Queens Quay would become the primary street address for new development in the Keating Channel Precinct (as opposed to Lake Shore Boulevard in Hybrid 1).

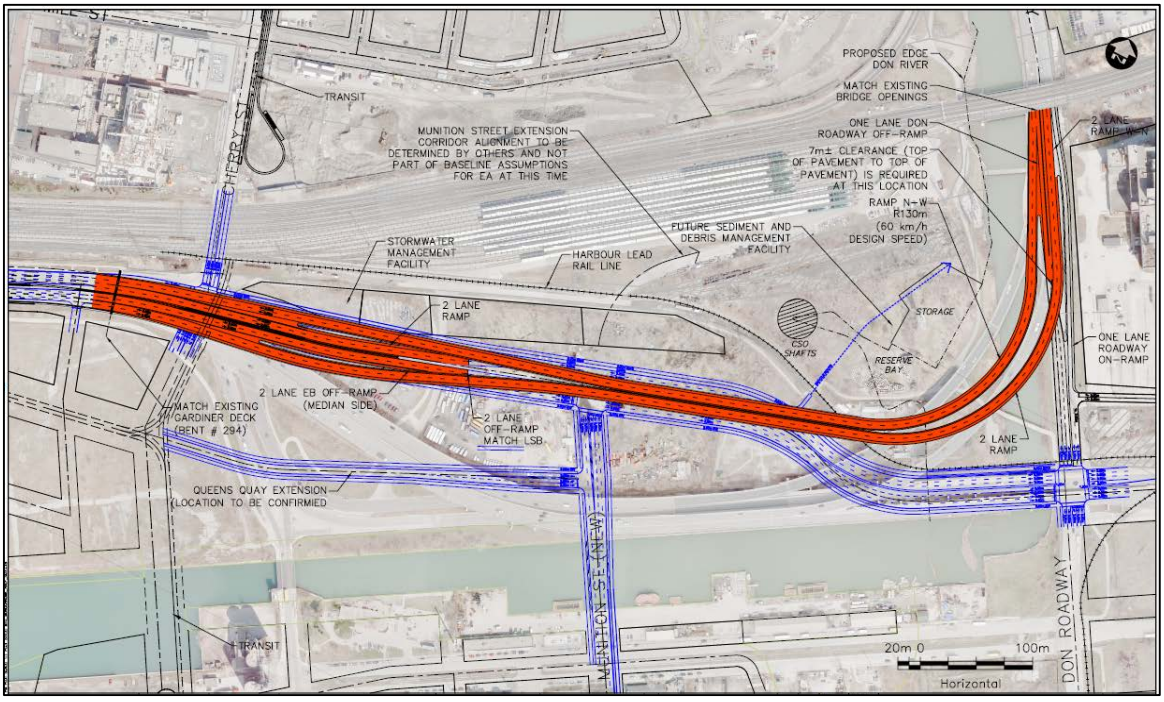

Figure 7: Hybrid Alternative 2

2.4 Hybrid Alternative Design 3: Road Design and Features

Hybrid 3 (see Figure 8 below) would push the elevated portion of the rebuilt Gardiner Expressway as far north as is feasible from the water's edge. The distinguishing road design and features of Hybrid 3 are as follows:

- The existing expressway connection would be removed and rebuilt to run through the Keating Channel Precinct as close to the existing rail corridor, and as far from the Keating Channel, as is possible (closer than Hybrids 1 or 2);
- The Metrolinx Don rail bridge underpass would be widened to allow for a more northern ramp location;
- New westbound on and eastbound off (both 2 lanes) Lake Shore Boulevard-Gardiner ramp connections would be constructed east of Cherry St. that would connect with a planned Munition Street extension;
- Lake Shore Boulevard would be aligned to run along the northern edge of future development blocks within the Keating Channel Precinct;
- The new Lake Shore Boulevard on/off ramps within the Keating Channel Precinct would be located in the middle of the expressway lanes (as opposed to outside the expressway lanes in Hybrid 1); and
- Though not part of the Gardiner East EA, the eastern terminus of the Queens Quay extension would form a new intersection with the Munition Street extension. Queens Quay would become the primary street address for new development (as opposed to Lake Shore Boulevard in Hybrid 1).

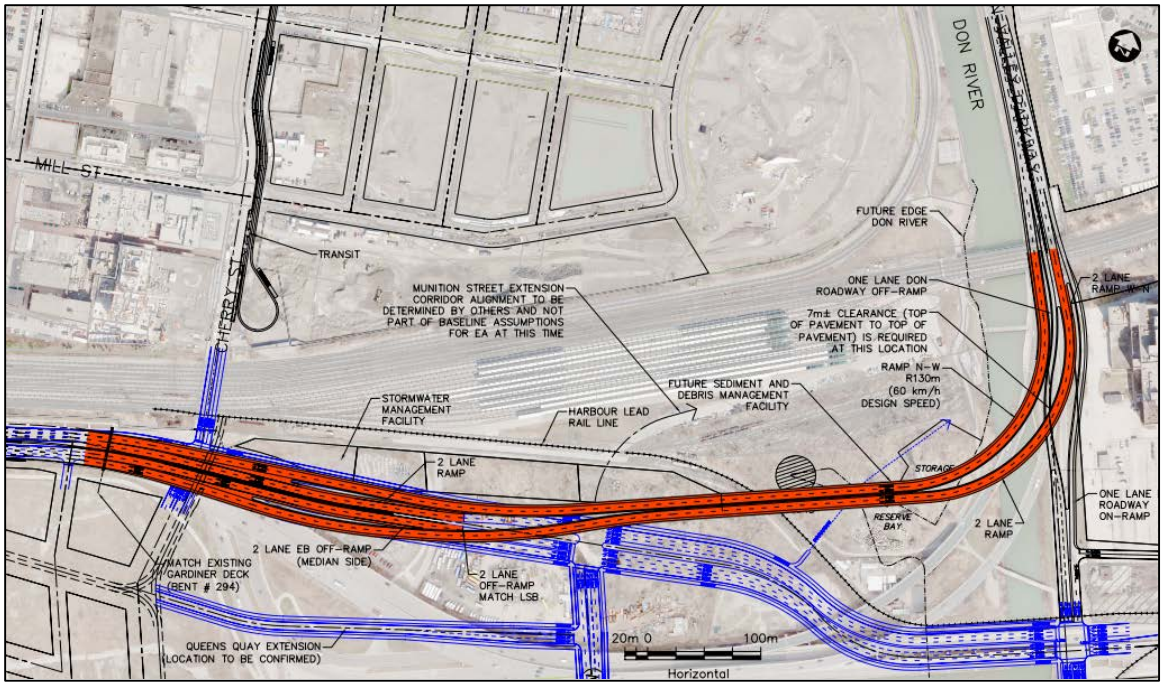

Figure 8: Hybrid Alternative Design 3

3. Gardiner East Corridor Urban Design Study Recommendations

The integrated urban design component of the Gardiner East EA focused on enhancing the physical relationship between the Gardiner Expressway and Lake Shore Boulevard, and the surrounding study precincts, in keeping with the principles set out in the EA goals and objectives, the Central Waterfront Secondary Plan and the Keating Channel Precinct Plan. This included consideration of roadway impacts on the future built environment, as well as design of open spaces and trail systems throughout the study area. Specific recommendations within the urban design study included:

- Streetscape design for Lake Shore Boulevard, including pedestrian improvements;
- A preliminary Keating Channel Precinct block plan for each Hybrid alternative (details to be confirmed through future planning efforts);
- Bikeway design and connections; and
- Conceptual improvements to the underside of the elevated Gardiner expressway from Cherry Street west.

3.1 Corridor Wide Proposed Design Elements

The corridor wide elements of the urban design recommendations include a continuous and connected pedestrian and cycling network, a continuous network of open spaces and improvements to the public realm through hard and soft landscaping, public art and animation.

Pedestrian Network and Cycling Connections

A proposed new multi-use trail would extend the length of the study area. The trail would be located along the north edge of Lake Shore Boulevard. The pedestrian network would also be enhanced through the implementation of continuous sidewalks along the north and south sides of Lake Shore Boulevard where possible. Improved pedestrian connections would enhance connectivity throughout the Central Waterfront and between the planned precincts.

Open Space

A conceptual system of new open spaces (including landscaped and naturalized areas, and pathway systems) would be developed along the north edge of Lake Shore Boulevard for the entire extent of the study corridor. The open space between Jarvis Street and Cherry Street would be integrated with the proposed multi-use pathway. The open spaces along Lake Shore Boulevard would include passive spaces to provide an improved balance of green space among the road infrastructure. In addition, the location and size of future public parks in the Keating Channel Precinct would be determined during the review of the Precinct Plan.

Public Realm, Public Art and Animation

There are many public realm design interventions that would be applied throughout the study area that do not require infrastructure changes. These would include landscaping, public art installations and animation of the existing public realm and open spaces.

3.2 Intersection and Streetscape Design Plans

Though detailed design of intersection and streetscape improvements are outside the scope of the Gardiner East EA, the integrated urban design study report also outlines design interventions proposed for various intersections within the EA study area. These various design proposals (presented in greater detail in Appendix 3: Alternative Design Evaluations Report by Dillon Consulting, February 2016) focus on:

- Physical intersection improvements (removing excess turning islands and regularizing intersections);
- Improving intersection legibility (understandable traffic movements for turns and through traffic);
- Opportunities to de-clutter intersections by identifying and addressing any excess signage;
- Using materials to differentiate pedestrian, cycling and automobile spaces;
- Opportunities for enhancing the underside of the Gardiner structure for public art and to improve the pedestrian experience;
- Connecting cycling facilities and pedestrian crossings; and
- Implementing hard and soft landscaping along Lake Shore Boulevard to improve the pedestrian experience.

In particular, stakeholder feedback consistently included concerns with pedestrian and cyclist safety at the intersection of Jarvis Street and Lake Shore Boulevard. City staff agree that this intersection would benefit from a safety audit investigation given its complicated nature, which includes the presence of Gardiner on and off ramps, and channelized turning lanes. The recommendations section of this report includes a recommendation for an in-depth safety review and a report back on improvements that can be made either as part of detailed design and implementation of the Gardiner East EA, or outside of the EA through the annual capital budget. This safety review will also consider the work and directions stemming from the Lower Yonge Municipal Class EA, which is currently studying the option to relocate the eastbound Jarvis off-ramp from the Gardiner, so that it would land on the west side of the Yonge and Lake Shore intersection.

3.3 Public Realm Implementation

The integrated urban design component of the Gardiner East EA has recommended a number of public realm improvements within a 2.4-kilometre study area that reaches from approximately Lower Jarvis Street to Logan Avenue. Naturally, this large study area overlaps with, and/or is adjacent to, the study areas of numerous other city-building and waterfront revitalization initiatives. Examples include, but are not limited to:

- Lower Yonge Precinct Plan;
- East Bayfront Precinct Plan;
- Keating Channel Precinct Plan;
- Villiers Island Precinct Plan;
- Don Mouth Naturalization Project EA;
- Port Lands Flood Protection;
- Port Lands Planning Framework; and
- Port Lands and South of Eastern Transportation and Servicing Master Plan.

Delivery of the proposed Gardiner East EA public realm improvements is likely to be realized through the implementation of the Gardiner Strategic Plan (once it incorporates the Gardiner East EA outcome) in concert with the many initiatives listed above. An implementation strategy is needed to identify how proposed public realm improvements can best be coordinated among the Gardiner Strategic Plan and the other initiatives. Given the different implementation timeframes of the longer list of area initiatives, a phasing plan should be generated as part of the implementation strategy. In addition, the implementation strategy should explore opportunities for cost sharing between the Gardiner Strategic Plan, the initiatives listed above and private land owners/developers. Finally, the implementation strategy should review whether City programs related to traffic safety, cycling and pedestrian infrastructure, civic improvement or public art will be implementing complementary projects within or proximate to the Gardiner East EA study area.

This report recommends that City staff report through the 2017 Capital Budget process on funding related to the proposed Gardiner East EA public realm improvements. While Capital Budget funding will be required to implement the improvements, City staff should assess the potential for other sources of funding to be utilized. Other potential sources of funding include: local developers, provincial and federal infrastructure funding programs and philanthropy (e.g., Project: Under Gardiner).

4. EVALUATION OF HYBRID ALTERNATIVE DESIGNS

The following provides a description of the differences among the three Hybrid Alternative Designs when assessed through the EA four evaluation lenses and associated criteria:

- Transportation and Infrastructure: includes criteria related to impacts for automobiles, public transit, pedestrians, cyclists, movement of goods, safety, and construction impacts;
- Urban Design: includes criteria related to impacts on planning, public realm, and built form;
- Environment: includes criteria related to impacts on social and health factors, the natural environment, and cultural resources; and

- Economics: includes criteria related to global and regional economics, local economics, and fiscal net benefits.

This four lens approach is consistent with the methods applied to earlier alternatives analyses conducted as part of the EA study process, and is organized according to the four study lenses identified in the approved EA Terms of Reference (September, 2009). Brief overviews of the comparative four lens evaluations are presented below. A comprehensive evaluation of the alternatives, with commentary on the specific criteria groups associated with each lens, is contained within the consultant report attached as Appendix 3.

4.1 Transportation and Infrastructure

The assessment of each Hybrid alternative against Transportation and Infrastructure criteria resulted in the following key findings:

- All three Hybrid Alternative Designs result in similar auto travel times and capacity along the corridor;
- Traffic modeling confirms the need for new access ramps at Cherry Street to replace the Logan ramps that would be removed east of the Don Roadway;
- Similar auto travel demand/volume is anticipated on Lake Shore Boulevard under all three alternative designs;
- Hybrids 2 and 3 are expected to have similar peak period auto travel times as previously forecasted for Hybrid 1;
- Construction periods for Hybrids 2 and 3 are slightly longer and require greater traffic detours than Hybrid 1 as they include rebuilding the Gardiner-DVP ramps; and
- Hybrids 2 and 3 facilitate the implementation of a preferred surface street network into the Keating Channel Precinct via a Queens Quay extension that is not possible under Hybrid 1.

4.2 Urban Design

The greatest potential for influence on urban design is the location of the ramps connecting the Gardiner to the DVP, and resultant compatibility issues with a planned revitalization of the Keating Channel Precinct. The assessment of each Hybrid alternative against the EA Urban Design criteria resulted in the following key findings:

- Hybrid 1 is less preferred when considering consistency with the Central Waterfront Secondary Plan and the Keating Channel Precinct Plan, as the new Gardiner on/off ramps and required access roads would result in a loss of public space in the Keating Channel Precinct and limit pedestrian access between the Keating Channel and the realigned Lake Shore Boulevard;
- Hybrid 1 is also less preferred for criteria related to streetscape, view corridors, public realm and open space. This is because it does not allow for the full

extension of Queens Quay East, minimizes access to the Keating Channel and has disrupted view corridors to the waterfront;

- Hybrids 2 and 3 are (respectively) modestly preferred and preferred alternatives, as both provide opportunities to improve Keating Channel Precinct development and add open space. Hybrid 3 further improves on Hybrid 2, as in addition to achieving the improvements noted for Hybrid 2, it provides the greatest improvement for landscaping and visual connections along Lake Shore Boulevard; and
- Hybrids 2 and 3 additionally provide for a two-sided Queens Quay, which is considered to be of greater value than a two-sided Lake Shore Boulevard due to the high-quality, pedestrian scale streetscape afforded by the narrower Queens Quay right-of-way.

4.3 Environment

The Environment Lens is concerned with noise and air quality, natural habitat, water quality and water quantity. There are few substantive differences among the alternative designs when evaluated through the environment lens and its related criteria, with the exception of noise and water quality, as summarized below.

Regarding potential noise effects, most of the receptors potentially affected in the study area are future receptors owing to a general lack of sensitive land uses currently within the study area. In the future condition, Hybrid 1 features the greatest number of dwelling units in closer proximity to the elevated expressway, and has limited opportunities to dampen noise effects from the expressway on local park spaces, along the planned waterfront promenade, and within nearby Villiers Island. Alternatively, the orientation and location of buildings on future development blocks in Hybrids 2 and 3 would shield noise effects of the expressway on future receptors along Queens Quay and the Keating Channel.

Hybrids 2 and 3 additionally present opportunities for water quality improvements. With the expressway rebuilt further north of the Keating Channel it is possible to implement improved storm water run-off management in a more sustainable manner. Alternatively, with the expressway located adjacent to the Keating Channel, Hybrid 1 presents greater challenges to managing storm water run-off effects on the channel.

As traffic volume is expected to be similar under all three Hybrid designs, air emissions are anticipated to be similar and as a result no differences among the alternatives are anticipated with respect to air quality.

4.4 Economics

The Economic lens distinguishes between Global, Regional and Local Economics, and the Fiscal Net Benefits, associated with each Hybrid Alternative Design.

Global, Regional and Local Economics

None of the alternative designs differ significantly with respect to global economic competitiveness or regional attractiveness of downtown Toronto. However, during the construction period for the project, Hybrids 2 and 3 would have greater short-term impacts on local mobility due to traffic detours required to construct the new Gardiner-DVP connections. Traffic detours would be temporary but would result in greater impact to mobility and auto traffic elsewhere in the downtown during the construction period. All alternative designs would support similar levels of employment, including support of the First Gulf development that is projected to generate substantial new jobs.

Fiscal Net Benefits Analysis

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. Based on a fiscal net benefit analysis, Hybrid 1 was determined to be the lowest cost alternative on an NPV basis over a 100-year timeframe, reflecting an estimated lifecycle infrastructure capital cost at $339 million NPV ($906 M in 2013$). Hybrid 2 has the second lowest estimated lifecycle infrastructure capital cost at $414 million NPV ($1.010 billion in 2013$) while Hybrid 3 has the highest estimated lifecycle infrastructure capital cost of $445 million NPV ($1.053 billion in 2013$).

Public Land Value Creation

An independent analysis of potential revenues from the sale of publicly owned land under the three alternative designs was undertaken by Cushman & Wakefield Associates.

Hybrid 1 would create approximately 5 acres of publicly owned redevelopment land, while Hybrids 2 and 3 would both create 7.5 acres of redevelopment land. The 2.5 acre increase in developable area is due to the creation of larger development blocks made possible by the relocation of the Gardiner further north.

Potential revenues from the sale of these publicly owned lands have been valued at approximately $40M - $50M for Hybrid 1, $70M - $80M for Hybrid 2, and $72M - $83M for Hybrid 3. The differences in these revenues is due to a premium associated with the additional waterfront lot frontage created by shifting the Gardiner alignment north from its current waterfront location (Hybrids 2 and 3 compared to Hybrid 1); and the additional value created when maximizing the offset between the Gardiner Expressway and future development blocks (Hybrid 3 compared to Hybrids 1 and 2).

5. CONCLUSION AND NEXT STEPS

The study team has evaluated each alternative design using groups of criteria consistent with the EA study Terms of Reference, and presented each design and their respective evaluations to project stakeholders at a January 19, 2016 Public Open House. Hybrid 3 has emerged as best meeting project goals and objectives, and was received most favourably by project stakeholders (when compared to Hybrids 1 and 2). Hybrid 3 is therefore recommended by the project team for identification as the Preferred Design within the final EA report to MOECC for review and approval.

A final decision on the Gardiner East EA is now imperative given the current condition of the Gardiner East section. Ongoing interim repairs are only intended to extend the service life of the structure to 2020. City Council direction on a Preferred Design will allow staff to complete and submit the EA report to the Minister of Environment and Climate Change (MOECC) and obtain final Ministerial approval, in order to commence the design and construction work within the required timeframes.

Upon receipt of Council's direction for a Preferred Design, an EA study report will be finalized and submitted to the MOECC for an approval decision according to the following schedule:

- April 2016: Complete a Draft EA Report and circulate for comment;
- June 2016: Submission of Final EA Report to MOECC; and
- Late 2016 to early 2017: EA approval decision by MOECC.

Additional information about the Gardiner East EA can be found on the project web site at www.gardinereast.ca

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SIGNATURE

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LIST OF APPENDICES:

Appendix 1:	Comparison of Conceptual Built Form
Appendix 2:	Comparison of Keating Channel Water's Edge Promenade
Appendix 3:	Alternative Designs Evaluation Report, Dillon Consulting, February 2016
Appendix 4:	Round Five Consultation Report, LURA Consulting, February 2016

Appendix 1: Comparison of Conceptual Built Form

From top to bottom: Hybrids 1, 2 and 3

Appendix 2: Comparison of Keating Channel Water's Edge Promenade

From top to bottom: Hybrids 1, 2 and 3