



**STAFF REPORT  
ACTION REQUIRED**

**Gardiner Expressway and Lake Shore Boulevard East  
Reconfiguration Environmental Assessment (EA) and  
Integrated Urban Design Study**

<b>Date:</b>	February 21, 2014
<b>To:</b>	Public Works and Infrastructure Committee
<b>From:</b>	John Livey, Deputy City Manager, Cluster B
<b>Wards:</b>	Ward 28 – Toronto Centre-Rosedale Ward 30 – Toronto-Danforth
<b>Reference Number:</b>	P:\2014\Cluster B\WF\PWI14002

**SUMMARY**

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This report seeks Council approval to proceed with "Remove" as the preferred alternative solution for the Gardiner Expressway and Lake Shore Boulevard East Reconfiguration Environmental Assessment (EA) and Integrated Urban Design Study (Gardiner East EA). An extensive consultation program and technical assessment of alternatives has found that the Remove option for the Gardiner East best meets the transportation and infrastructure, urban design, economics and environment objectives of the EA study.

The Gardiner East EA study area includes the 2.4-kilometre elevated segment from approximately Lower Jarvis Street to Logan Avenue. A timely decision on the future of this portion of the Gardiner is needed. The structure is more than 50 years old and requires significant public investment, regardless of whether Council decides to have it removed, maintained, improved or replaced. The study team is reporting to Council at this critical juncture to seek direction to proceed with developing detailed EA plans and final recommendations prior to reporting back in 2015.

In 2012, incidents of falling concrete occurred in the Jarvis Street east section of the Gardiner as well as in western segments. Council authorized a series of interim repairs in 2013 to maintain the area in a safe and operable condition, delaying full reconstruction of the easterly deck to 2020, pending completion of the EA. The City's approved \$662.7 million 13-Year Budget (2013 to 2025) for rehabilitating the 18-kilometre Gardiner Expressway includes reconstruction of the Jarvis east portion, which forms the "base

case" for the Maintain option in the EA. A report on an accelerated rehabilitation approach for the entire stretch of the Gardiner Expressway is the subject of a separate report to this Committee.

The EA Terms of Reference are based on the City's Official Plan and Central Waterfront Secondary Plan policies to revitalize the waterfront and reconnect it to the City, balance modes of travel, achieve sustainability and create value. The EA study has been carried out in full consultation with the community and stakeholders under the direction of a joint City of Toronto and Waterfront Toronto Executive Steering Committee.

## Assessment of EA Options

This report summarizes the nine-month process for the development, refinement and assessment of four representative EA options for the Gardiner East that led to the preferred EA recommendation of Remove. The four representative EA options were:

1. Maintain under the City's committed rehabilitation program (i.e., "do nothing");
2. Improve the transportation and urban design features of the corridor;
3. Replace with a new expressway structure; and
4. Remove the elevated expressway east of Jarvis Street and upgrade Lake Shore Boulevard as an eight-lane boulevard with a new connection to the Don Valley Parkway.

Using 16 criteria groups that summarized 60 measures, the Maintain, Improve, Replace and Remove options were screened against four evaluation lenses: transportation and infrastructure, economics, urban design and environment. The measures were not weighted as both quantitative and qualitative data were collected and assessed by consultants and staff from various disciplines. Each option was compared against the measures, then against each other, until a preferred alternative – Remove – emerged as the best means of meeting the EA study goals and objectives set out in the Terms of Reference approved by the Ontario Ministry of the Environment.

**Figure 1 – Don River and Keating Channel Looking North**

**Existing (Maintain and Improve)**

**Remove**



Key features of the Remove preferred EA alternative are:

- Removal of the six-lane elevated Gardiner Expressway from Jarvis Street east;
- Widening of Lake Shore Boulevard east of Jarvis Street by two lanes into an eight-lane landscaped at-grade boulevard;
- The lowest overall public investment at \$240 million net present value (NPV) because of significantly lower lifecycle costs despite a higher upfront capital cost than Maintain;
- Public land disposition proceeds of approximately \$80 to 90 million NPV from the release of about 4 hectares of land (which could support 260,000 square metres of development); and
- Highest compatibility with Official Plan and Central Waterfront Secondary Plan principles and objectives as well as approved plans, such as the Don Mouth Naturalization and Flood Protection EA, Lower Don Lands Framework Plan, Keating Channel Precinct Plan and the Port Lands Acceleration Initiative.

However, as discussed in Section 3.3 of this report, the Remove option was also estimated to increase travel times of some corridor trips by 5 to 10 minutes longer than the future 2031 Maintain condition (itself an additional 5 minutes over today's condition).

If endorsed by Council, Remove would be subject to further development and assessment in the alternative design stage of the EA. The design stage will look at mitigation and impact management to address travel times, traffic flow and signal timing, as well as possibilities for accelerating demolition and construction to minimize disruption to travellers. Other design stage issues would include public realm improvements, the definition of development parcels, traffic management, construction staging, ramp design and intersection configuration. A detailed financing strategy would be prepared. In 2015, the public, Committee and Council would consider the final design and detailed financial implications for Remove along with the EA Report, prior to submission to the Minister of the Environment.

Deferral of a decision on the future of the Gardiner Expressway East is not recommended given the interim nature of repairs and the uncertain duration of the EA approvals process in a project of this complexity. Should Council approve the Maintain or "do nothing" alternative, staff would consult with the MOE on withdrawing from the current EA process. Full deck rehabilitation between Jarvis Street and the DVP would be undertaken as scheduled from 2020 to 2025, or earlier if an accelerated model of rehabilitation is adopted.

Information about the Gardiner East EA, including summaries of public forums, can be found on the project web site at [www.gardinereast.ca](http://www.gardinereast.ca).

## RECOMMENDATIONS

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The Deputy City Manager, Cluster B, recommends that:

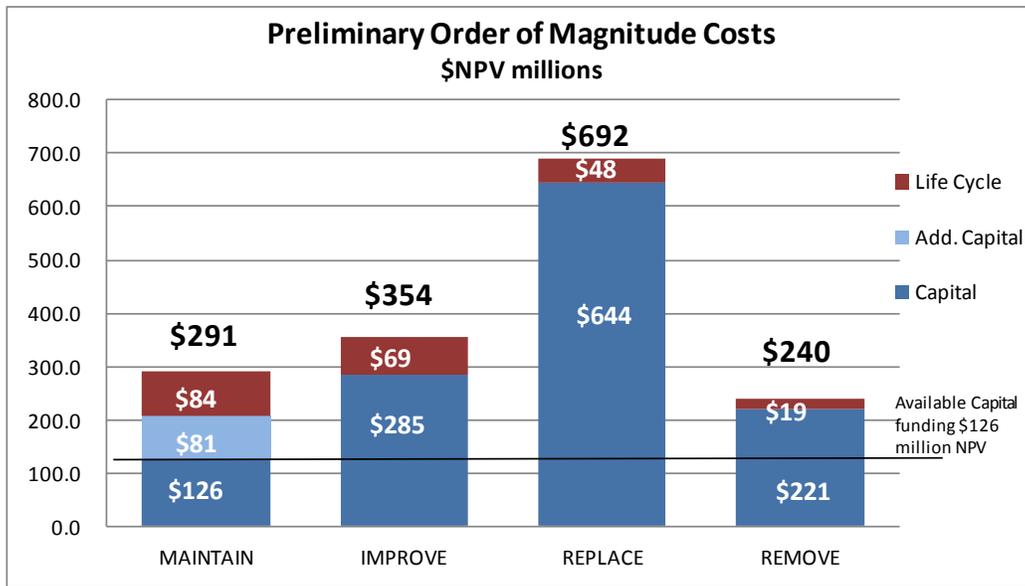
1. City Council approve Remove as the preferred EA alternative solution for the Gardiner Expressway and Lake Shore Boulevard East Reconfiguration Environmental Assessment and Urban Design Study;
2. City Council direct the Deputy City Manager, Cluster B, and the appropriate officials to report back in 2015 on the preferred design for the Remove alternative solution and on the EA Report for the Gardiner Expressway and Lake Shore Boulevard East Reconfiguration Environmental Assessment and Urban Design Study, prior to submission to the Minister of the Environment;
3. City Council direct the Deputy City Manager and Chief Financial Officer and the appropriate officials to report back in 2015 on a detailed financing strategy in conjunction with the completion of the preferred design for the Remove alternative solution and the resulting refined capital cost estimates; and
4. City Council authorize and direct the appropriate City officials to take necessary action to give effect thereto.

## FINANCIAL IMPACT

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

This EA process has presented four alternative roadway configurations. Capital cost estimates for each of the four roadway configurations were developed along with longer term life cycle costs for capital replacement over a 100 year time frame for comparison and evaluation purposes. Due to the long time frame and variances in costs and timing of capital features amongst alternatives, a discounted cash flow analysis was prepared, and all figures represent a net present value (NPV) in current dollars for comparison and evaluation purposes. All figures are estimates only and can vary between 10% and 20%.

Based on this analysis and as demonstrated in the table below, the Remove option was determined to be the lowest cost alternative on an NPV basis over a 100 year time frame. Further, based on other evaluation criteria further discussed, this report recommends Remove as the preferred option.



Source – Project Engineering Consultants – Morrison Hershfield, Peer Reviewed by Delcan

Note: Net present value represents the sum of the present values of future capital expenditures, in this case for each of the four EA 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. These NPV estimates differ slightly from numbers previously presented based on City evaluation of project engineering consultant estimates and the application of the City's discount factors.

## ii) Budgetary Impact (inflated dollars required for construction)

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.

Transportation Services' 2014 to 2023 Capital Budget and Plan includes capital funding for the Gardiner Rehabilitation Program based on 13-year total cost estimates of \$662.7 million identified in the report EX31.26 entitled "Revisions to the F. G. Gardiner Expressway Rehabilitation Project" that was adopted by Council at its meeting of May 7, 2013. Of the 13-year total cost estimates, \$230 million has been included for the years 2020 to 2025 for East Deck and Bent Repairs under the Rehabilitation Program. The report can be found at:

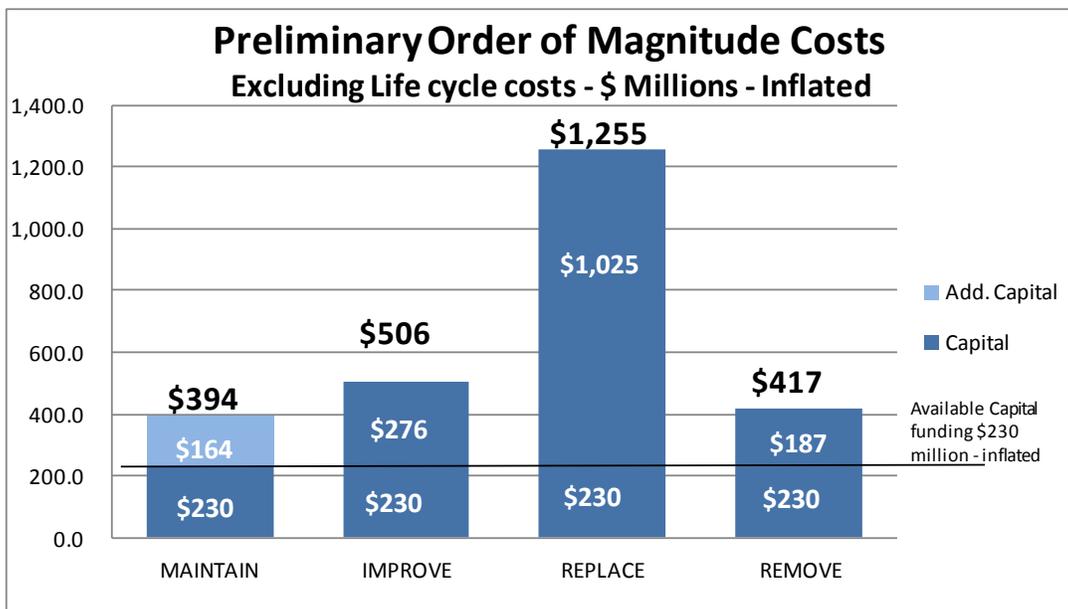
<http://www.toronto.ca/legdocs/mmis/2013/pw/bgrd/backgroundfile-57200.pdf>

Under all four EA options, additional necessary capital work outside the Jarvis Street to Don Valley Parkway area will be required in future years beyond the current Rehabilitation Plan for the East Deck replacement of \$230 million (inflated to year of construction). These additional items include future year costs beyond the current 10-

Year Approved Capital Plan for Lake Shore Boulevard realignment; longer term replacement costs of a Don River bridge; future replacement of Don and Logan ramps; and the future expressway deck replacement between Yonge and Jarvis. The addition of these costs ensures a true apples-to-apples comparison of the four EA alternatives.

The timing to construct these capital works beyond the current 10-Year Capital Plan would occur following the year 2030. In the case of the Lake Shore Boulevard realignment the timing is yet to be determined.

The following table illustrates the estimated budgetary impacts of the four EA options above the base level of planned funding to rehabilitate the East Deck of the Gardiner Expressway from the years 2020 to 2025.



### iii) Impact on the Revised F.G. Gardiner Expressway Approved Capital Program

The recommended Remove preferred alternative solution in the Gardiner Expressway East EA, which is based on preliminary estimates, requires capital funding of \$417 million from 2020 to 2026. This will result in an increase in required funding of \$23 million as compared to the Maintain option. However, it does represent the lowest cost alternative by an estimated \$51 million on an NPV basis over a 100-year timeframe.

While the recommended Remove option will require an additional upfront capital investment beyond the Maintain option, the net impact on the City will be substantially less than \$23 million, as this initial investment will yield a combination of long term savings from the avoidance of future life-cycle capital replacement costs as well as

generate additional revenue from the sale of excess public land made available from freed up area along the current East Deck of the Gardiner Expressway.

An added benefit of recommending the Remove option is the inclusion within this alternative of the Lake Shore Realignment. This requirement was outside of the scope of the original Rehabilitation Plan but is ultimately a transportation priority that would have required Council's consideration for added capital funding. The recommended Remove option ensures an accelerated completion of this realignment within the scope and preliminary cost estimates of the overall capital project.

In terms of the impact on the entire F.G. Gardiner Expressway Capital Program (East and West Decks), the recommended Remove option of the East Deck along with the additional necessary capital work required outside the Jarvis Street to Don Valley Parkway area reflected in all four EA alternatives will result in a revised total project cost over the 2013 to 2026 period of a preliminary estimate of \$850 million from the previous cost of \$663 million.

#### **iv) Potential Funding Sources**

As noted above, adoption of the Remove option would yield revenues from excess land sales as described in this report and savings in the form of ongoing lifecycle capital replacement costs. The land sales revenue will likely occur after the construction period has ended, and the savings from ongoing capital replacement costs will occur over a longer timeframe.

While these savings and revenues will be realized over the longer term, the preliminary estimate of additional upfront capital costs totalling \$187 million required for both the increased capital needed for the Remove option as compared to the Maintain option (\$23 million) and the additional necessary capital work required outside the Jarvis Street to Don Valley Parkway area reflected in all four EA alternatives (\$164 million) will require financing.

The Deputy City Manager and Chief Financial Officer will report back in 2015 on a detailed financing strategy in conjunction with the completion of the preferred design for the Remove alternative solution and the resulting refined 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 preliminary estimates of an additional \$187 million, annual debt charges in the amount of \$12 million would be required to undertake the Remove option. These debt charges would be funded from various sources to minimize the tax impact, including proceeds from future land sale and future life cycle savings that could be applied to mitigate the impacts of such debt.

In addition, the Deputy City Manager and Chief Financial Officer will also be seeking Provincial and Federal funding for this initiative, specifically application of the Building Canada Fund will be requested for this project. The overall impacts can also be

considerably mitigated through a P3 procurement process that will also be reviewed as part of the report back.

Lastly, consideration in the 2015 report will also be given to maximizing other non-debt financing sources such as eligible Development Charge funding that may be applied to certain aspects of the project, specifically the Lake Shore Realignment and the continued application of the capital financing strategy beyond the year 2025.

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

## **DECISION HISTORY**

Following earlier studies by the former City of Toronto and Metropolitan Toronto in 1990-1991, the Royal Commission on the Future of the Toronto Waterfront ("Crombie Commission") proposed the removal of the entire elevated Gardiner Expressway between Exhibition Place and its eastern terminus, and its replacement with a network of tunnels and surface roads. The study findings can be found in the Royal Commission's final report: "Regeneration: Toronto's Waterfront and the Sustainable City," Chapter 10 – "The Central Waterfront," pages 303 to 414, at: <http://www.waterfronttrail.org/partner-resource-center/publications#regeneration-toronto-s-waterfront-and-the-sustainable-city-final-report-1992>

As a first step, the need for the 1.3-kilometre long elevated segment of the Gardiner from just west of the Don River to Leslie Street was assessed by the former Municipality of Metropolitan Toronto. From 1999 to 2001, this segment was dismantled at a cost of approximately \$40 million. Public art and pedestrian and cycling trails were installed alongside the exposed section of Lake Shore Boulevard East.

In 2001, the Toronto Waterfront Revitalization Task Force ("Fung Task Force") proposed that the remainder of the elevated Gardiner Expressway be removed (see: <http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=56c94f058377f310VgnVCM10000071d60f89RCRD&vgnextchannel=cf777c6a9967f310VgnVCM10000071d60f89RCRD>).

In 2003, the City asked the Toronto Waterfront Revitalization Corporation (TWRC, now Waterfront Toronto) to examine opportunities for the redesign of the Gardiner/Lake Shore corridor in support of waterfront revitalization. TWRC reviewed three basic alternatives to the existing expressway: Replace, Transform and Great Street: <http://www.waterfronttoronto.ca/dbdocs/451d7d515766d.pdf>

1. The Replace option involved the replacement of the entire elevated expressway with a combination of tunnels and at-grade roads;

2. The Transform option retained the elevated expressway, enhanced it with the removal of ramps, addition of architectural features and relocation of Lake Shore Boulevard from beneath it; and
3. The Great Street option called for the replacement of the elevated expressway east of Spadina Avenue with an at-grade street similar to University Avenue.

In 2004, TWRC selected the Great Street as the option worthy of further consideration. The proposal was for a 10-lane, two-way road between Spadina Avenue and Simcoe Street, a pair of five-lane, one-way roads between Simcoe Street and Jarvis Street and an eight-lane, two-way road east of Jarvis Street. TWRC conducted a detailed analysis of the Great Street. The analysis documents are available at:

[http://www.waterfrontoronto.ca/misc\\_pages/search?query=Gardiner+Lake+Shore+Corridor+Report&search\\_button=Search&filter\\_pages=none&filter\\_projects=none&filter\\_documents=all&filter\\_match=Match+Any+Occurrence&filter\\_events=none&filter\\_galleries=none&filter\\_news=none](http://www.waterfrontoronto.ca/misc_pages/search?query=Gardiner+Lake+Shore+Corridor+Report&search_button=Search&filter_pages=none&filter_projects=none&filter_documents=all&filter_match=Match+Any+Occurrence&filter_events=none&filter_galleries=none&filter_news=none)

A review of TWRC studies found the cost of the Great Street had increased significantly from earlier estimates, from \$780 million (2005) to \$1.2 billion (2007), in part because of the costs of the Front Street Extension. In 2007, Waterfront Toronto and City staff collaborated to find a more affordable solution to the redesign of the Gardiner. It was found that the less-developed eastern waterfront area offered greater opportunity to both avoid constraints and shape new development patterns. On June 12, 2008, the Waterfront Toronto Board of Directors approved a resolution recommending to the City that an Individual Environmental Assessment (EA) be undertaken to examine options for the 2.4-kilometre Gardiner East. In July 2008, City Council authorized the City and Waterfront Toronto to jointly undertake an Individual EA for the Gardiner East:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2008.EX22.1>

In September 2008, Planning and Growth Committee considered a "Further Report on Removal of the Gardiner Expressway East from Jarvis":

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2008.PG19.3>

In August 2009, City Council authorized the submission of the Gardiner East EA Terms of Reference to the Minister of Environment:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2009.EX33.17>

In November, 2009, the Minister of Environment approved the Gardiner East EA Terms of Reference:

[http://www.waterfrontoronto.ca/explore\\_projects2/the\\_gardiner\\_expressway/the\\_gardiner\\_ea\\_terms\\_of\\_reference](http://www.waterfrontoronto.ca/explore_projects2/the_gardiner_expressway/the_gardiner_ea_terms_of_reference) The City and Waterfront Toronto consequently initiated the EA phase of the study, based on the Terms of Reference.

In considering the City's 2013 Capital Budget and 2014 to 2022 Capital Plan on January 15 to 16, 2013, City Council reallocated \$4.41 million within the Waterfront Revitalization Initiative budget for the Gardiner Expressway and Lake Shore Boulevard

Reconfiguration East Environmental Assessment (EA) and Integrated Urban Design Study. See Recommendation #84:

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2013.EX27.1>

On April 10, 2013, Public Works and Infrastructure Committee received an information report on the Gardiner Expressway and Lake Shore Boulevard Reconfiguration Environmental Assessment and Integrated Urban Design Study. It included a commitment to report back on a preferred Gardiner East EA alternative in spring 2014.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2013.PW22.2>

On May 7, 2013, City Council endorsed revised phasing strategy for the Gardiner Expressway Rehabilitation Project pending completion of the Gardiner East EA. Westerly deck replacement was authorized in advance of easterly deck reconstruction, along with \$9.1 million of interim repairs to maintain the expressway east in a state-of-good repair.

<http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2013.EX31.26>

## **ISSUE BACKGROUND**

The F.G. Gardiner Expressway is an at-grade and elevated expressway built between 1955 and 1966 that extends approximately 18 km from Highway 427 to east of the Don Valley Parkway. It is a six-lane controlled access highway with generally three lanes in each direction that carries roughly 200,000 cars per day west of the downtown core, and 120,000 cars per day east of Lower Jarvis Street. Lake Shore Boulevard is a six-lane arterial road located underneath the elevated Gardiner for about two-thirds of its length.

The Gardiner requires ongoing investment in repair and rehabilitation. After several incidents of concrete falling from the structure in 2012, the City commissioned an independent assessment of the City's Gardiner maintenance practices. This led to completion of a Strategic Rehabilitation Plan, which now forms the basis of all future capital spending on the Gardiner, including the City's approved \$662.7 million 13-Year Budget (2013 to 2025).

### **Gardiner Expressway and Lake Shore Boulevard Reconfiguration EA and Integrated Urban Design Study**

To date, the Gardiner East EA has considered the merits of four alternative concepts: Maintain, Improve, Replace, and Remove. The first three alternatives retain the separate functions of the elevated expressway and Lake Shore Boulevard beneath it, while the Remove alternative eliminates the elevated structure and replaces it with an expanded eight-lane at-grade Lake Shore Boulevard.

The EA consultant team is being led by Dillon Consulting Limited (Dillon) supported by

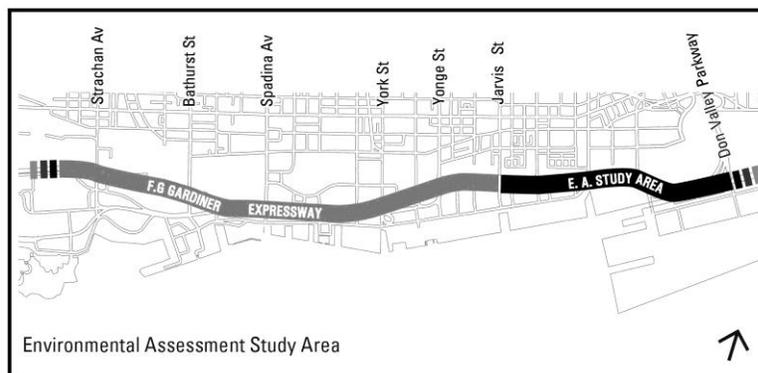
Perkins+Will, Morrison Hershfield, Hargreaves Associates, HR&A Advisors and Archaeological Services Inc. LURA Consulting is providing independent facilitation and public consultation services.

The EA is 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 is supported by City and Waterfront Toronto project co-leads and a project team consisting of Project Managers from Waterfront Toronto, the Waterfront Secretariat, City Planning and Transportation Services. A Technical Advisory Committee reports to the project team. Waterfront Toronto and City Communications staff also provide support.

As shown in Figure 2 below, the Gardiner East EA study area includes the 2.4-kilometre elevated segment of the expressway from approximately Lower Jarvis Street to Logan Avenue. EA options for the elevated expressway also involve transitions immediately to the east and west.

The EA Terms of Reference, notes that the Gardiner and Lake Shore East corridor occurs within a broader urban design and environmental effects study area from King Street to the waterfront and Lower Jarvis to Logan Avenue, as well as a transportation system study area that extends from Spadina Avenue to Woodbine Avenue, and from Dundas Street south to the waterfront.

**Figure 2 – Gardiner East EA Study Area**



Within the study area, the Gardiner generally contains three eastbound and three westbound through lanes, with a traffic volume of about 110,000 vehicles per day, equally split in each direction. Each Gardiner lane has a vehicular capacity of about 1,800 vehicles per lane per hour, for a total of 5,400 per hour in each direction. Lake Shore Boulevard's three eastbound and three westbound lanes carry about 13,000 cars per day. Each Lake Shore Boulevard lane has a vehicular capacity of about 800 cars per lane per hour, for a total of 2,400 vehicles per hour in each direction. Combined, the Gardiner / Lake Shore East corridor carries 120,000 cars per day, or about half the 200,000 vehicular volume per day in the corridor west of Jarvis Street.

A report on options to rehabilitate the entire at-grade and elevated stretch of the Gardiner Expressway is the subject of a separate staff report to the Committee. Recommendations for the reconfiguration of the York-Bay-Yonge eastbound Gardiner exit ramp endorsed by Council in 2012, do not affect the Gardiner East EA study.

An overview of the results of the consultation program and technical evaluation that led to the identification of Remove as the recommended preferred EA alternative solution provided below.

## **COMMENTS**

### **1. The Gardiner Expressway EA Planning Framework**

The Gardiner East EA study area is subject to several City of Toronto policies. Based on Official Plan and Central Waterfront Secondary Plan principles, the EA Terms of Reference call for all options explored through the EA process, "to ensure that strong city-building objectives remain at the centre of the technical analysis and that a successful urban environment characterized by design excellence results from this effort".

#### **1.1 Official Plan and Central Waterfront Secondary Plan Context**

Toronto's Official Plan, approved by Council in 2002, provides a policy framework to manage the city's growth and development. It promotes revitalization of Toronto's waterfront and well-designed connections between the city and the lakefront. Should Council endorse the recommendations in this report, an Official Plan amendment would be required in order to recognize significant change to the Gardiner east of Jarvis Street.

Removing barriers/making connections, promoting a clean and green environment, creating dynamic and diverse new communities, and building a network of spectacular waterfront parks and public spaces are core principles of the Central Waterfront Secondary Plan approved by Council in 2003. The Secondary Plan describes the Gardiner as a "major physical barrier that cuts off the city from the waterfront" and anticipates new mixed-use development and employment and population growth in the area.

The Roads Plan (Map A) of the Secondary Plan shows the existing Gardiner Expressway as part of the road system in the waterfront but notes that it is subject to further study. Amendment of the Secondary Plan would be required to recognize significant change to the Gardiner east of Jarvis Street. Staff would report further on amendments to the Official Plan and Secondary Plan following Council endorsement of a preferred EA alternative, and subject to final approval of the EA by the Ministry of the Environment.

#### **1.2 City Building Objectives for the Gardiner East EA Study**

Five city-building goals outlined in the Gardiner East Terms of Reference guide the EA study:

1. Revitalize the Waterfront  
Today, both the Gardiner Expressway and Lake Shore Boulevard east of Jarvis Street focus on movement of vehicles and goods rather than on place-making, quality of life or the rejuvenation of lands under and adjacent to the expressway. The EA study addresses both the continued movement of passenger vehicles and goods, and place-making through design excellence.
2. Reconnect the City with the Lake  
Reconsideration of the Gardiner/ Lake Shore East corridor needs to include welcoming and accessible routes to the waterfront and new waterfront communities to overcome the existing physical and psychological barriers.
3. Balance Modes of Travel  
The Terms of Reference call for a balance of public transit, motor vehicles, pedestrians and cyclists through the provision of appropriate infrastructure to serve local neighbourhoods and the greater Toronto region.
4. Achieve Sustainability  
Alternatives for the Gardiner/Lake Shore corridor will consider Official Plan policies regarding the promotion of green, healthy and energy efficient development, and employ design solutions that can improve environmental quality and biodiversity, and enhance flood conveyance and protection.
5. Create Value  
EA solutions will explore opportunities to enhance and/or release adjacent publicly owned lands for redevelopment.

## **2. EA Terms of Reference, Purpose of the Undertaking and Assessment Phases**

An Individual EA prepared under the Environmental Assessment Act involves a two-stage process: 1) preparation and Minister of Environment approval of a Terms of Reference for the EA, which defines the Purpose of the Undertaking, and outlines the work plan, including the studies and consultation to be carried out during the course of the EA; and 2) preparation of the EA itself.

The Purpose of the Undertaking is to address current problems and opportunities in the Gardiner Expressway and Lake Shore Boulevard East study area. Key problems include a deteriorated expressway that needs major repairs, as well as a waterfront that is disconnected from the city. Key opportunities include revitalizing the waterfront through new buildings, neighbourhood streets and new public realm.

There are two assessment phases within an Individual EA. The first analyzes the preferred alternative solution, while the second considers alternative designs for the preferred solution.

Each evaluation phase follows the same three steps:

1. Develop evaluation criteria;
2. Assess potential effects and benefits (advantages/disadvantages); and
3. Evaluate alternatives and select the preferred alternative.

This report brings forward the assessment results from the first phase of the EA study.

## **2.1 EA Public Consultation Program**

The Gardiner East EA has been conducted in an open, publicly accessible manner in accordance with the Environmental Assessment Act. With the assistance of LURA Consulting as Independent Facilitator, the process featured public forums; outreach to government agencies, landowners, business groups, developers and other affected parties; Aboriginal community engagement in accordance with the City's First Nation Consultation Protocol for Environmental Assessments; the establishment of Stakeholder Advisory and Technical Advisory Committees to provide advice and input at key milestones (see Appendices 3 and 4 respectively); a dedicated project web site; and the use of online engagement tools, Facebook ([facebook.com/GardinerEast](https://www.facebook.com/GardinerEast)) and Twitter (@GardinerEast).

Public consultation findings are summarized in Section 4 below. Key consultation milestones and public consultation summaries for this Alternative Solutions Phase of the EA are in Appendix 5 and also available at [www.gardinereast.ca](http://www.gardinereast.ca).

## **3. Assessment of EA Options & Selection of a Preferred EA Alternative**

The four options that were evaluated are described in brief below.

Maintain – approximately \$291 million NPV +/- 10%:

- The six-lane Gardiner remains in place and 900,000 square metres of deck are rehabilitated;
- Maintains auto capacity;
- Does not include public realm improvements;
- Funding is fully committed through the City's capital budget for the first 10 years;
- Land development opportunities are limited to current approved Keating Channel Precinct plans; and
- Six years of construction impact on Gardiner travel lanes.

Improve – approximately \$354 million NPV +/- 20%

- The six-lane elevated expressway is reduced to four lanes, which are rehabilitated as per Maintain;
- The two southern lanes are removed to bring light to Lake Shore Boulevard below where public realm, cycling and safety improvements are made;
- East of Cherry, Lake Shore Boulevard is realigned north per the Keating Plan;

- Modest land development opportunities of \$2M NPV west of Cherry Street south of Lake Shore Boulevard; and
- Six years of construction impact on Gardiner travel lanes.

Replace – approximately \$692 million NPV +/- 20%:

- A new higher four-lane elevated expressway is constructed further north supported on single columns spaced further apart than today's piers;
- A new four lane Lake Shore Boulevard tucked under the Gardiner between Jarvis Street and Cherry Street;
- Land creation opportunities include \$65 million to \$70 million NPV from about 2 hectares of land; and
- Eight years of impact on Gardiner travel lanes with full closure of corridor for periods.

Remove – approximately \$240 million NPV +/- 20%:

- Removal of the six-lane Gardiner Expressway East;
- A new at-grade, eight-lane Lake Shore Boulevard lined with 1,200 trees, a two-sided street, dedicated turning lanes, sidewalks and cycling trails;
- New Gardiner ramps to the Don Valley Parkway;
- Land creation opportunities of \$80 million to \$90 million NPV from about 4 hectares of land; and
- Three years of construction impact on Gardiner travel lanes.

It should be noted that two other Replace options were studied but were not carried forward. First, a new elevated expressway over the rail embankment was ruled out because of incompatibility with the future requirements of Metrolinx. Second, a one-kilometre tunnel was dismissed because of an estimated \$2.5 billion cost, the need for long transitions at the tunnel's ends, and the lack of connectivity to the north-south roads that link the corridor to the downtown.

### **3.1 Evaluation Factors and Criteria**

The assessment of the EA options was based on a set of 16 criteria groups that summarize 60 measures confirmed through a public process. The criteria consider both numerical and qualitative data organized on the basis of the four study lenses in the Terms of Reference: Transportation and Infrastructure, Urban Design, Economics and Environment.

The measures were not weighted as quantitative and qualitative data were collected and assessed by a consultants and staff from various disciplines. Once the potential effects for each alternative were identified, advantages and disadvantages for each EA option were considered and summarized in an evaluation matrix, which is posted on the project web site at [www.gardinereast.ca](http://www.gardinereast.ca). The Terms of Reference outlined the "paired-comparison" approach to be used in the evaluation process in which each option was compared against

another on all measures. The preferred alternative of each paired comparison was carried forward until an alternative was identified as being preferred over all the others.

### **3.2 Results of Evaluation of Alternatives**

The Remove option is recommended as the preferred EA alternative solution for the Gardiner East. It best meets the EA study goals and objectives, including the EA study evaluation lenses that form the pillars of the project. The key features of Remove are:

#### **Transportation & Infrastructure**

- Removal of the six-lane elevated Gardiner Expressway from east of Yonge Street to its terminus at Carlaw Avenue;
- Expansion of Lake Shore Boulevard by two lanes into a landscaped at-grade, eight-lane boulevard;
- Enhanced pedestrian and cycling environment including additional sidewalks and cycling trails;
- Full intersections at Logan and Carlaw Avenues with potential for north-south vehicular connections between the Don Roadway and Logan Avenue;
- Shortest construction impact on Gardiner travel lanes at three years; and
- Elimination of all 10 existing turn restrictions in the corridor.

#### **Urban Design**

- Highest compatibility with Official Plan and Central Waterfront Secondary Plan principles as well as approved plans, including the Don Mouth Naturalization and Flood Protection EA, Keating Precinct Plan and Port Lands Framework and Precinct Plans via vehicular and transit extension of Broadview Avenue;
- Significant improvement in East-West and North-South view corridors;
- High quality of experience for drivers, pedestrians and cyclists with ground floor retail, shops and outdoor patios adjacent to the improved boulevard.

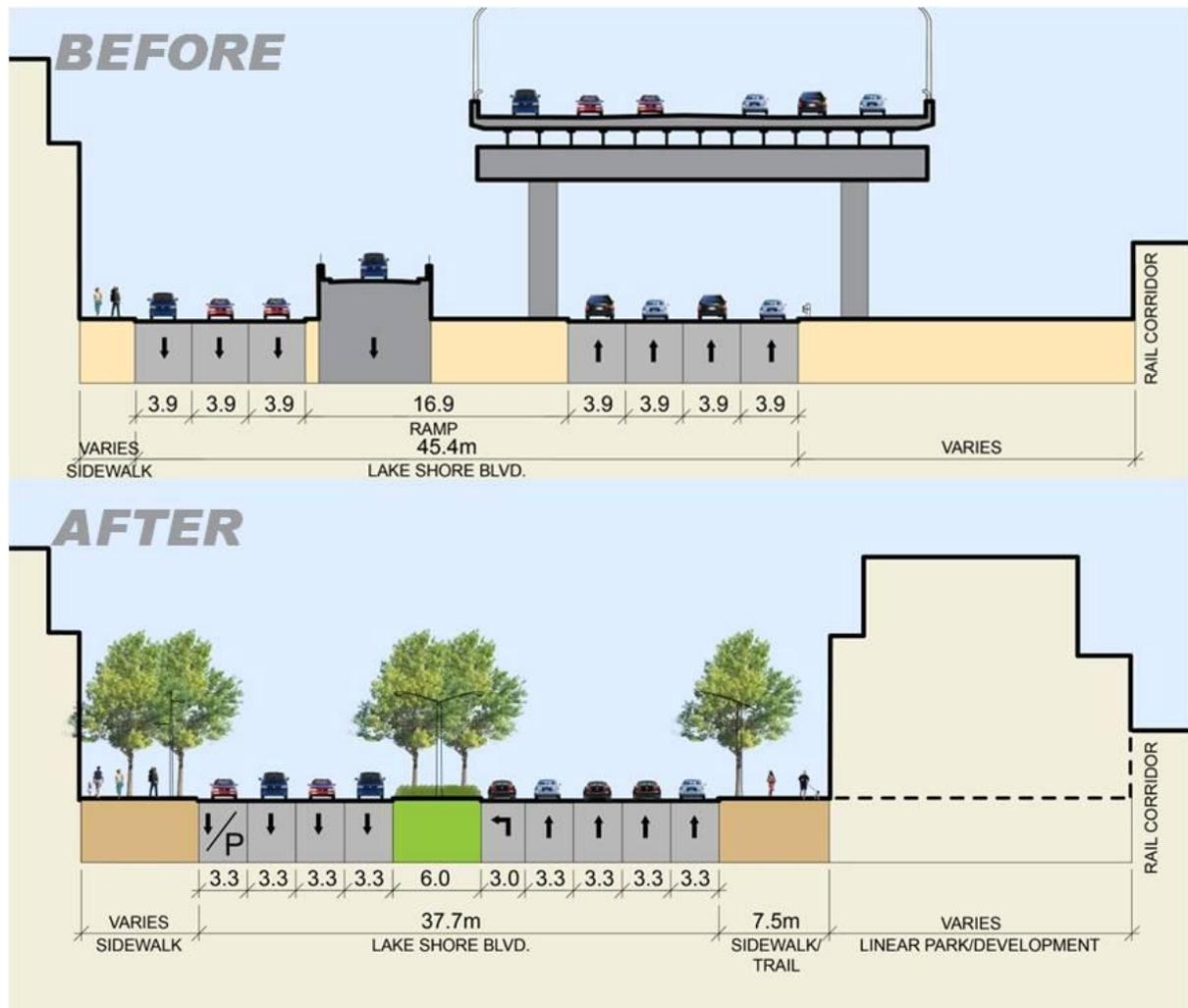
#### **Environment**

- Lowest noise levels, local and regional air quality and regional greenhouse gas emissions;
- Low water diversion into storm sewers due to low quantity of paved areas; and
- Greatest opportunity for tree planting, natural vegetation and tree canopy.

#### **Economics**

- At about \$240 million NPV, the lowest public investment because of reduced maintenance costs for an at-grade road versus an elevated expressway;
- Public land disposition proceeds of approximately \$80 to 90 million NPV from the release of 4 hectares of land (which could support 260,000 square metres of development) east and west of Cherry Street above the 9 hectares forecast for all EA options as part of the Council-approved Keating Precinct Plan; and
- An estimated 2,100 jobs from street-level retail, restaurants and shops.

**Figure 3 – Before and After Cross-Section of Lake Shore Boulevard East**



### Criteria Group Ranking

As summarized in the following matrix, many assessment considerations of the EA options led to the Remove recommendation, including traffic impacts, transit considerations, pedestrian and cycling facilities and connections, safety and constructability, the enhancement of the public realm, environmental impacts, regional and local economics, direct cost and benefit, and land value creation.

**Table 1 – Criteria Group Ranking Summary**

**Preference Ranking Code**

Preferred	Moderately Preferred	Least Preferred				
Study Lens/ Criteria Group	MAINTAIN	IMPROVE	REPLACE	REMOVE		
<b>TRANSPORTATION &amp; INFRASTRUCTURE</b>						
Automobiles						
Transit						
Pedestrians						
Cycling						
Movement of Goods						
Safety						
Constructability						
<b>URBAN DESIGN</b>						
Planning						
Public Realm						
Built Form						
<b>ENVIRONMENT</b>						
Social and Health						
Natural Environment						
Cultural Resources						
<b>ECONOMICS</b>						
Regional Economics						
Local Economics						
Direct Cost and Benefits						
<b>SUMMARY</b>	Maintains auto capacity. Does not lead to transformation of the corridor and commits the City to live with an elevated waterfront expressway for decades to come.	Addresses many of the negative impacts of the existing infrastructure while maintaining auto capacity and functionality. Does not lead to transformation of the corridor and commits the City to live with an elevated waterfront expressway for decades to come. Allows for small additional advancement of the CWSP objectives over the base condition.	Significantly cost required to create a new elevated expressway. And while LSB level changes are substantial, the analysis shows that the alternative does not result in direct economic benefits commensurate with the investment.	This transformative option yields substantial benefits to the eastern waterfront in terms of environmental quality, city-building, and development compatibility. Local benefits are considerably greater than under any other alternative, while lifecycle costs are the Less. Negative impacts are primarily related to longer auto travel times for those continuing to choose this form of transportation to access the downtown.		
<b>EVAUATION RESULTS</b>	<b>Not Preferred</b>	<b>Not Preferred</b>	<b>Not Preferred</b>	<b>Preferred</b>		

### 3.3 Transportation and Infrastructure

Transportation and Infrastructure is one of the four lenses considered in the evaluation of the Gardiner options, and includes all modes for moving people and goods. The study examined the impacts of the EA alternatives on automobiles, public transit, pedestrians, cyclists and goods movement, as well as the duration, management and impact of preliminary construction staging plans. More detail can be found in Appendix 1: Gardiner Expressway and Lake Shore Boulevard East Reconfiguration EA Alternative Solutions Evaluation Interim Report (the "Alternative Solutions Evaluation Interim Report") from Dillon Consulting Limited.

To determine the impact of the different EA options on vehicular traffic, the transportation scope of work carried out by City staff included travel demand forecasting, land use and transportation analysis, transit sensitivity testing of future scenarios, congestion cost analysis, and the coordination of a transportation model peer review. Dillon Consulting assisted the City in the transportation assessment.

#### Transportation Modelling

Transportation modelling used the City of Toronto's EMME/2 model for forecasting future travel demand patterns in 2031. The time period represented in the model is the three-hour AM peak period, an industry standard to represent the greatest demand for travel and most likely period for congestion to occur.

A number of assumptions regarding the population, employment, and transit conditions in 2031 are included in the model. Additional details and assumptions in the model, such as road capacity and network changes, and auto/transit mode splits, are outlined in Appendix 6: Transportation Modelling Considerations.

#### Population and Employment Assumptions

The EMME/2 model inputs for 2031 projections included:

Area	Population			Employment		
	Current	2031 Forecast	Growth	Current	2031 Forecast	Growth
<b>GTHA</b>	6.57 M	8.61 M	31 %	3.26 M	4.52 M	39 %
<b>Toronto</b>	2.61 M	3.07 M	17.6 %	1.27 M	1.83 M	44 %

#### Transit Assumptions

Assumptions in the EMME/2 model reflect the importance of future transit improvements as keys factors in managing transportation congestion, facilitating growth and supporting new jobs. "Feeling Congested", the transportation component of the City's five-year Official Plan review, identifies 24 future rapid transit projects for review. Among the projects assumed in the model are:

- Relief Line (subway) between the Danforth subway line and the Yonge-University line (2021);
- Waterfront East LRT – Union Station to Leslie (Phase 1 to Parliament – 2020);
- Cherry Street LRT south of King Street East (2015 completion for the extension to Mill Street/rail corridor);
- Broadview Avenue transit extension south of Queen Street into the Port Lands (pre-2031);
- Union Station Improvement Plan (2016); and
- GO Transit improvements, including frequency, reverse commute and off-peak service improvements.

A sensitivity analysis was conducted to assess the EA alternatives without the new transit lines in place. The analysis found that, if unsupported by transit service, all four EA options would place additional pressure on existing TTC and GO Transit services beyond their current capacity, as well as on the road network, especially for automobile trips on the Don Valley Parkway to the Port Lands. It is clear from the analysis that new transit service and network improvements are essential to accommodate future populations and the creation of new job opportunities in the study area, the downtown, the city as a whole and the region beyond.

## **Transportation and Land Use Trends**

The historical population, employment and transportation trends in the central area of the city (Bathurst Street to the Don Valley Parkway and Dupont Street to the lake) show increases in central area population and employment of 65% and 29% respectively, since 1985. This has resulted in an increase in the residents-to-jobs ratio of 1:2.2 in the present, up from 1:3 in 1985, which means a change in commuting patterns as more downtown jobs are filled by downtown residents. During the same period, automobile trips have increased by 19% but have decreased as a percentage of the overall mode of travel, and while truck traffic has been constant in terms of actual volumes, trucks as a percentage of automobile traffic have decreased from 3% to 2.6%. A 2009 Bluetooth survey also showed:

- 22% of eastbound vehicles on the Gardiner from west of Bathurst travel straight through the downtown and do not exit;
- 17% of westbound vehicles on the Gardiner from the DVP/Lake Shore travel straight through the downtown and do not exit;
- 40% of southbound vehicles on the DVP exit at Richmond Street; and
- the majority of trips in both directions are destined to the Yonge-Bay-York and Spadina off-ramps.

Since 1985, TTC trips generally account for about 45-50% of downtown inbound trips while GO Transit use has increased by 85% since 1985. New transit capacity is required to accommodate Toronto's future population and employment growth regardless of

whether the Gardiner East is maintained, improved, replaced or removed. Without it, all the options for the future of the eastern Gardiner face an increase in traffic congestion and travel time for auto drivers/passengers and transit users.

By 2031, inbound trips to the central area are estimated to increase by approximately 50%, and the majority will be accommodated by transit, while automobile traffic to the central area is estimated to grow by approximately 15% but continue declining as a percentage of overall travel. Transit service into the central area is expected to increase by 61% for TTC and 95% for GO Transit.

### **Transportation Modelling Peer Review**

Waterfront Toronto, in collaboration with the City of Toronto, commissioned the consultant ARUP to perform a peer review of the modelling process in fall 2013. The objective of the peer review was twofold: to confirm that the modelling process undertaken was reasonable and was performed to industry-standard levels; and to confirm the appropriateness of the assumptions and the reliability of the output and conclusions drawn from the process.

The peer review provided a detailed examination of the modelling process used for the transportation analysis, including its assumptions, and suggested recommendations for improvement where applicable. Although the peer review identified some minor issues, they were deemed to have minimal potential impact to the final analysis results. The conclusion of the peer review was that the overall modelling process and assumptions used in the analysis were sound and met industry-standard practices.

Further information on the Transportation and Transit Analysis is provided in Appendix 6: Transportation Modelling Considerations and in Appendix 1: Alternative Solutions Evaluation Interim Report.

#### **3.3.1 Automobiles**

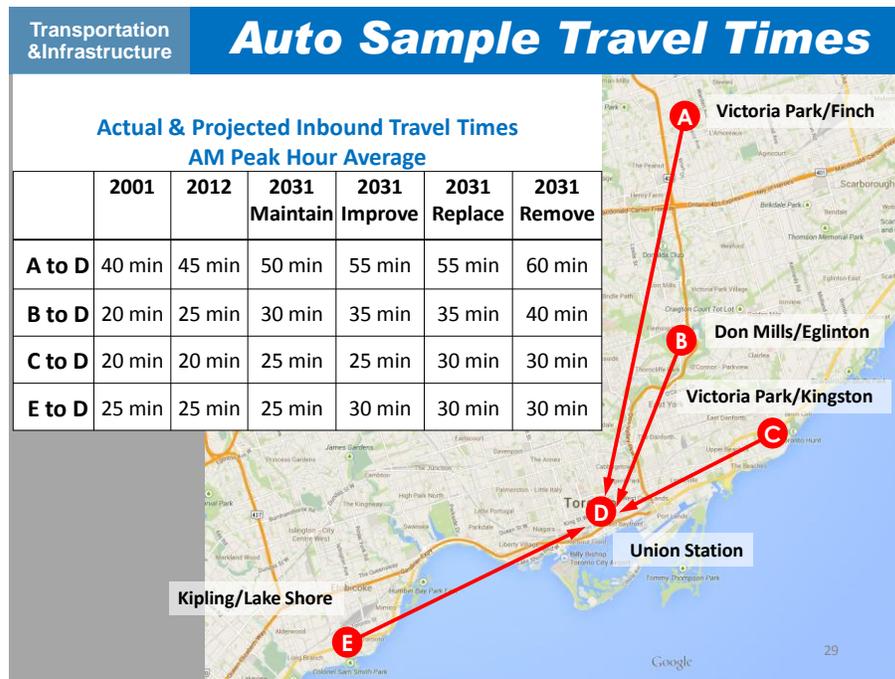
EMME/2 travel demand runs were completed for existing conditions, and for the future Maintain and Remove options. The results were further assessed using a micro simulation model (Paramics) for the project study area bounded by Spadina Avenue in the west, Dundas Street to the north, Woodbine Avenue in the east and the lake to the south. The Paramics model was also used to assess the Improve and Replace options, and key travel data from the model were used in the comparative evaluation of the options.

The EMME/2 model was also used as part of a two-stage process with Dillon's Paramics model to estimate existing and future travel times beyond the project study area for the four Gardiner options. This process first analysed the origins and destinations of vehicles using the Gardiner (a select link analysis). Based on the density of the trip patterns, specific origin points were selected and the intersection of Bay Street and Front Street was selected to represent a downtown destination for comparing travel times. The origin

points for the analysis are Victoria Park/Finch, Don Mills/Eglinton, Victoria Park/Kingston, and Kipling/Lake Shore in the west end.

Figure 4 summarizes the findings of the travel time analysis. Travel times for 2031 are best estimates and there may be variations subject to a number of factors (e.g., weather, major incidents, construction and special events). Travel times can also vary on a daily basis under existing conditions.

**Figure 4 – Auto Sample Travel Times**



The findings indicate that under Maintain the projected travel times from the present to 2031 will increase by approximately 5 minutes for westbound trips. Average AM peak hour auto travel time among various O/D pairs is forecast to increase by an additional 10 to 20% (5 to 10 minutes) depending on the EA option over the future 2031 Maintain condition. For the Remove option, travel time is estimated to increase by 5-10 minutes over the Maintain option. Specifically, the travel time from Victoria Park/Finch increases by 10 minutes, the trip from Don Mills/Eglinton increases by 5 minutes, and the other two trip times remain the same when modelled.

In addition to the estimated travel time comparison, the comparative automobile evaluation assessment by Dillon also considered average peak hour auto travel times and the number of turn prohibitions within the study area. The results indicate that Maintain is preferred from the perspective of travel time, Improve and Replace are moderately preferred, and Remove is less preferred. In terms of turn prohibitions, Maintain is less preferred, Improve and Replace are moderately preferred and Remove is preferred.

Additional information on travel time comparisons is included in the Appendix 1: Alternative Solutions Evaluation Interim Report.

### **3.3.2 Transit**

This criteria group examined the impact of EA alternatives on future streetcar and subway service as well as the ability to accommodate planned transit service. All EA options were found to be of equal preference in regards to transit impacts. Streetcar travel times modelled in the transportation study area along Dundas, Queen and King Streets using Paramics, found that Maintain has the least impact on transit travel times, followed by Improve which has a slight increase, then Remove and Replace which result in 1-to-3 minute increases in streetcar travel times. No impact to subway service was anticipated for any of the options. Remove and Replace offered the best opportunity to accommodate future transit facilities in the area, such as the Broadview streetcar extension.

### **3.3.3 Pedestrian and Cycling**

This criteria group looked at the availability, dimension and condition of north-south and east-west sidewalks and cycling routes as well as crossing distances. Replace and Remove were found to provide the best opportunity to improve the corridor condition for pedestrians and cyclists, with new walking facilities, shorter crossing distances of Lake Shore Boulevard (23.7 and 37.7 metre north-south crossings at Jarvis Street respectively), a north side multi-use pathway and a total cycling route of 4.2 kilometres including existing facilities beyond the elevated expressway. Improve provides improved sidewalks and a cycling route of 2.6 kilometres in length, but has greater crossing distances, while Maintain provides limited sidewalks, the longest crossings at 42 to 45 metres and an existing cycling route of 2.2 kilometres.

### **3.3.4 Movement of Goods**

This criterion examined vehicle operations and access opportunity, including turning prohibitions that could affect truck vehicle operations in the corridor. The results indicate that Maintain and Improve are preferred for vehicle operations during peak periods because they provide the greatest amount of road capacity, while Replace and Remove are preferred from an access opportunity point of view because they will have no or limited turning prohibitions compared to Maintain and Improve.

### **3.3.5 Safety**

The intersections of Lake Shore Boulevard at Jarvis, Sherbourne and the Don Roadway were in the top 20% of intersections for collisions in the city between 2007 and 2011. The safety risk to pedestrians, cyclists and motorists in the Gardiner / Lake Shore corridor was examined as part of the EA. Overall, Replace and Remove resulted in the highest preference rankings for most of the safety criteria, with Improve and Maintain less so. Safety criteria included the number of lanes at intersection crossing points,

uncontrolled conflict points, design speeds, road safety concerns such as limited sightlines and visibility, and availability of shoulders along the expressway.

### **3.3.6 Constructability and Construction Impacts**

While all four EA options would result in traffic impacts during construction, some alternatives would be more disruptive than others. Replace requires a more complex program of staged construction and would have eight years of continuous rolling impacts on Gardiner and/or Lake Shore travel lanes. Maintain and Improve would each have six years of impact but would be able to keep lanes open on the Gardiner. Remove has the shortest impact on travel lanes at three years, but involves more complex traffic management during construction and may require the use of private property for temporary detour routes.

Detailed and refined construction plans will be developed for the preferred EA alternative approved by Council so that construction impacts can be understood more precisely.

## **3.4 Urban Design**

Urban design was the second of the four lenses considered in the evaluation of the Gardiner East EA options. The evaluation considered to what extent the proposed changes to the Gardiner East would be consistent with key policy documents that define the City's waterfront objectives and principles: the Official Plan, Central Waterfront Secondary Plan and precinct plans. More detail can be found in the Alternative Solutions Evaluation Interim Report, attached as Appendix 1.

### **3.4.1 Planning**

The Maintain and Improve alternatives would do little to achieve the intent of the Central Waterfront Secondary Plan principles. While they would allow the physical layout of the precinct plans to be achieved, they would not support the development of highest value land uses adjacent to Lake Shore Boulevard due to the continued presence of the elevated structure.

Replace would further the goals of the Central Waterfront Secondary Plan by improving north-south crossings, adding some green space, and improving the alignment of Lake Shore Boulevard, but a newly constructed elevated expressway would still negatively impact the adjacent precincts.

Remove would fully achieve the Central Waterfront Secondary Plan principles and policies by removing the visual barrier of the elevated expressway, regularizing north-south crossings and creating a tree-lined urban boulevard. Remove would also support the precinct plans by better accommodating pedestrians and cyclists within an enhanced public realm, and supporting high value land uses along Lake Shore Boulevard.

### 3.4.2 Public Realm

When the quality, consistency and character of the streetscape along Lake Shore Boulevard were considered, Maintain and Improve were found to propose few improvements to the street's appearance and pedestrian amenities. There would be improvements where Lake Shore Boulevard would move away from the Keating Channel, consistent with the Keating Precinct Plan. However, the streetscape between Jarvis Street and Cherry Street would see little change under either alternative.

Replace would provide considerable improvements resulting from the narrowing of the roadway at-grade and increased landscaping to offset the paved areas of the boulevard and roadway. The expressway structure would be further north, away from development blocks, creating opportunity for enhanced sidewalks adjacent to buildings and improved sky views.

The Remove alternative would provide the most public realm improvements by eliminating the overhead expressway which would improve the street character, allow sun exposure, and eliminate noise amplification. The character of the urban boulevard would be consistent throughout the study area with minor variations as required by the width of the corridor. This would result in a greatly enhanced streetscape on Lake Shore Boulevard.

Views were considered when reviewing alternatives and the removal of an overhead structure was recognized as a being a significant improvement to the public realm. Maintain and Improve would not enhance views along Lake Shore Boulevard, or between the city to the north and the waterfront. Replace would improve views along Lake Shore Boulevard, with a higher structure on fewer columns, but the structure would be visible above the railway berm when viewed from the north. Remove would provide open views between this section of Lake Shore Boulevard and the downtown, as well as improved views between the surrounding neighbourhoods and the Lake.

Consideration was also given to the amounts of land that each alternative might allocate for public open spaces including multi-use paths, landscaping, parks and plazas. Maintain and Improve would provide little increase or improvement. Remove would provide more lands for tree-lined sidewalks, cycling trails and soft landscaping, and the removal of the elevated expressway would also create the potential for development on the north side of Lake Shore Boulevard. A two-sided street would be an optimal improvement to the public realm but provide less landscaped open space than Replace. Replace would provide the most land for an expanded public realm with a reduced number of lanes on Lake Shore Boulevard and a reconstructed expressway that would require significantly less area for columns and ramps.

Consideration was also given to the extent to the ability of alternatives to mitigate the impact of the adjacent railway corridor. Remove was preferred as it would provide the

only opportunity to reduce the visual and noise impacts of the rail corridor on pedestrians with the potential development on the north side of Lake Shore Boulevard between Jarvis and Sherbourne Streets.

### **3.4.3 Built Form**

The assessment considered the opportunities for leasable, active, at-grade space which would be supported by the design of the corridor. It examined the number and quality of podium floors available for development fronting on Lake Shore Boulevard.

With both the Maintain and Improve alternatives, the existing elevated structure would negatively impact the quality of space within, at least, the lower four to seven floors of buildings fronting on Lake Shore Boulevard. Under the Replace alternative, at-grade uses would benefit from the associated improvements to the public boulevard and increased pedestrian flow. The elevated expressway structure would negatively impact the lower four to seven storeys of buildings on Lake Shore Boulevard. Remove would present the greatest benefit to adjacent development with the full corridor uncovered and augmentations to the adjacent boulevard. Uses above-grade would also benefit from enhanced views and reduced noise levels in the Remove scenario.

### **3.4.4 Compatibility with Neighbourhood Plans**

The extent to which EA options could be coordinated with approved City plans for emerging waterfront neighbourhoods was an important evaluation measure. The Gardiner East has a direct impact on a number of emerging waterfront communities destined to absorb significant future population and employment growth, including Lower Yonge, Lower Don Lands, Keating Channel, East Bayfront and South of Eastern/Port Lands. These precincts are the subject of considerable planning, business, transit and transportation studies authorized by City Council. They are also the subject of public and private investment through the tri-government waterfront revitalization initiative, which prioritizes public transit as the primary mode of transportation.

#### **(a) Lower Yonge Precinct**

The portion of the Lower Yonge Precinct from Lower Jarvis Street west to Yonge Street is within the westerly transition area of the Gardiner East EA study area. The area is experiencing significant redevelopment. The approved York-Bay-Yonge Interchange Reconfiguration EA will result in modifications to the ramps and street configurations.

Under the Remove option, the Lower Yonge Precinct would be the transition area from the elevated expressway to the new at-grade boulevard, with limited public realm opportunities. Replace provides the best opportunity for public realm enhancements, with Improve providing minimal improvements at the Jarvis-Lake Shore intersection.

## **(b) Lower Don Lands**

Renaturalization of the Don River Mouth is the cornerstone of revitalizing the 125-hectare Lower Don Lands precinct that runs from Parliament to the DVP, and from the rail corridor south to the Ship Channel. The creation of the new river valley further south of Keating Channel will redefine future mixed-use communities, remove risk of flooding from the Don River to most of the Port Lands and address impaired soil and groundwater conditions. The Don Mouth Naturalization and Port Lands Flood Protection EA (DMNP EA) is currently being finalized. All of the Gardiner East EA alternatives are compatible with the DMNP program.

Removal or Replacement of the Gardiner Expressway East both enable the creation of a landmark or legacy bridge structure over the Don River to specified widths that will also assist with flood conveyance and sediment / debris management by allowing for more clearance over the river and possibly the removal of several existing piers. Maintain and Improve allow for existing plans to be carried forward but do not provide additional opportunity for enhancement.

## **(c) Keating Channel Precinct**

The Keating Channel Precinct is the first precinct to be planned within the Lower Don Lands. It is located between Parliament Street and the Don River, south of the rail corridor and north of Villiers Street. It includes the City's holdings at 480 Lake Shore Boulevard East, as well as lands adjacent to the Parliament Street Slip.

The Keating Channel Precinct Block Plan, attached at Appendix 2, consists of 25 development blocks centred around the Keating Channel, with a combined land area of about 9 hectares. The plan proposes to relocate Lake Shore Boulevard north of the Gardiner. It was designed with the elevated Gardiner in place, although community facilities, development sites and the Lower Don River channel are affected by noise, shadows, views and other impacts of the Gardiner. The expressway piers restrict the alignment and design options for Lake Shore Boulevard, Cherry Street, Parliament Street and local streets in the precinct.

While Maintain and Improve allow for existing plans to be carried forward, Remove and Replace offer the best opportunities to re-examine the Gardiner's constraints and optimize block patterns, road alignments, parks and public spaces in North Keating, as well as enhance connections with the Lower Don Lands.

## **(d) East Bayfront**

The East Bayfront is located immediately south of the Gardiner East corridor between Jarvis and Parliament Streets, directly on the waterfront. The East Bayfront precinct plan identified the Gardiner as a "barrier along the north-south passages that impacts the built form of new development along that edge." There are several development proposals for

new buildings along the south side of Lake Shore Boulevard in East Bayfront which are currently premised on adjacency to an elevated expressway. Maintain, Improve and Replace would not change this. The Remove option would provide the opportunity to reorient these projects toward Lake Shore Boulevard and enhance their north façades to create more vibrant and attractive streetscapes. The improvements to Lake Shore Boulevard, as well as north-south streets such as Jarvis, Sherbourne and Parliament, would help connect neighbourhoods to the north with East Bayfront and the waterfront.

### **(e) South of Eastern and Port Lands**

Employment lands flank the ramped section of the elevated Gardiner east of the Don River as it transitions to Lake Shore Boulevard East. North of the eastern Gardiner ramp (and Lake Shore Boulevard East) is the Keating Rail Yard. Further north, is the west end of the South of Eastern Employment Area. South of the Gardiner ramp are existing employment lands in the north portion of the Port Lands district. In September 2012, Council endorsed the first phase of the Port Lands Acceleration Initiative to advance development for the Port Lands. A Port Lands Planning Framework and Transportation and Services Master Plan (which includes South of Eastern) as well as Precinct Plans for the Film Studio District and Cousins Quay are currently in development.

Remove would provide the opportunity to extend vehicular and transit service on Broadview Avenue south of Eastern Avenue to Bouchette Street in the Port Lands Film Studio District. It would also enable additional public realm and urban design improvements at the renaturalized Don River and along Lake Shore Boulevard to the east. In recent discussions with landowners adjacent to the Gardiner / Lake Shore Boulevard corridor, removal of the Gardiner in conjunction with transit service were seen as catalysts for development, particularly for commercial office property. The ongoing presence of the Gardiner ramp connection to Lake Shore Boulevard in this area under Maintain and Improve prevent the extension of Broadview Avenue.

## **3.5 Environment**

The environmental lens in the Gardiner East EA consists of three criteria groups: Social Health, Natural Environment and Cultural Resources. Remove emerged as the preferred EA alternative for both Social Health and Natural Environment, but was moderately preferred for Cultural Resources, as outlined below and in the Alternative Solutions Evaluation Interim Report, attached as Appendix 1.

### **3.5.1 Social Health**

Air Quality and Noise were measured under this criteria group. The Remove option was the most preferred of the EA alternatives under both Air Quality and Noise.

## **Air Quality**

Regional and local air quality and greenhouse gas emissions were measured for each EA option using Environment Canada's MOBILE 6.2C model, which outputs emission factors for key contaminants such as CO<sub>2</sub> and SO<sub>2</sub>. The air quality analysis was influenced by future forecast transportation volumes of each option. Remove was found to have the least regional air quality burden contribution at 0.24%, while Maintain, Improve and Replace were similar at 0.25%. Local air quality emissions were analyzed for over 2,000 points of reception for both existing and future planned land uses under each EA option. Remove and Replace are predicted to have the lowest air emissions for the local area receptors, while Improve is moderately preferred and Maintain is ranked lower. A regional burden analysis for greenhouse gas emissions for a 24-hour period found that Remove also had the lowest reading at 0.24%, compared to 0.28% for Improve and Replace, and 0.29% for Maintain.

## **Noise**

Noise modeling was completed using the Ministry of Transportation endorsed ORNAMENT (Ontario Road Noise Analysis Method for Environment and Transportation) which calculates noise impacts at Points of Reception. Under the model, Remove is forecast to have the lowest noise levels with a range of 61 to 72 dBA. Improve and Replace have noise levels for the same 150 receptor locations in ranges of 67 to 78 dBA, while Maintain levels are expected from 69 to 78 dBA.

### **3.5.2 Natural Environment**

Remove was found to be most preferred in four of the six criteria under Natural Environment. With the lack of an elevated structure, reduction in paved surfaces and opening up of the study area to sunlight, Remove resulted in the greatest opportunities among the EA options for plantings and natural features under terrestrial environment, as well as for water quantity, microclimate and tree-lined and shaded streets. All four options were ranked equally for aquatic environment due to improved runoff control into the Keating Channel through the realignment of Lake Shore Boulevard as well as the Don Mouth naturalization project. Replace was most preferred for water quality as it provides the most source controls/ground infiltration.

### **3.5.3 Cultural Resources**

None of the four EA options are expected to result in impacts for Built Heritage, Cultural Landscape, and First Nation People and Activities and were equally ranked. Maintain and Improve were preferred in regards to Archaeology because they have the least level of excavation and disturb 3 and 2 archaeological features respectively, while Remove and Replace were less preferred because they have the potential to disturb nine additional archaeological features discussed in Table 2 of the appended Dillon Gardiner East EA Alternative Solutions Evaluation Interim Report.

## 3.6 Economics

The final lens considered in the evaluation of the Gardiner options was economics. The study examined the impacts of the EA alternatives on regional and local economic conditions, including post-construction congestion cost estimates. In addition, the direct

costs and financial benefits were studied. More detail can be found in the Alternative Solutions Evaluation Interim Report, attached as Appendix 1.

### 3.6.1 Regional Economics

As described in Section 3.3 above, the four options under consideration had varying impacts on Gardiner East capacity, and vehicular and surface transit travel times. The forecast delay of 5 to 10 minutes per trip under the Remove option as a result of reduced vehicular capacity was the greatest. Improve and Replace were expected to increase travel times by less than 5 minutes per trip. Similar impacts could be expected for goods movement to and around the downtown. At the same time, there would be considerably more residents and jobs adjacent to the Gardiner East as a result of the Remove and Replace options, which would increase the attractiveness of new residential precincts and employment areas. More housing in or close to downtown would have a positive impact on the City's downtown, increasing access to labour.

These factors could have a variety of impacts from a Greater Toronto Area regional competitiveness perspective. A 2001 paper published by the National Cooperative Highway Research Program (NCHRP) at: [http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_463-a.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_463-a.pdf), noted that "wages paid by employers to their employees differ by location and tend to reflect the extent to which workers incur greater costs and travel times for commuting to their jobs. Thus, a foundation of evidence suggests that businesses incur higher labor costs associated with increasing congestion." (NCHRP Report 463, 2001, page 26) The paper noted Chicago and Philadelphia case studies confirming "congestion does reduce the agglomeration benefits of urban areas by reducing access to specialized labor and delivery markets." (NCHRP Report 463, 2001, page 4)

More recent research completed by HR&A Consultants examined the role of expressways in or near Central Business Districts in successful North American cities such as New York, Chicago and Vancouver and found that, "cities may remove elevated expressways from the downtown area or not have one altogether without major adverse traffic impacts" (Dillon, February 2014). HR&A noted evidence from comparable case studies that travellers adapt to a reduction of vehicular capacity, and a significant share of vehicles "evaporate" from the road network, resulting in no observable negative impacts.

The Economics evaluation in the EA study showed that the Maintain option would cause the least disturbance to travel patterns but would forego some and also significantly delay other urban redevelopment in the Gardiner East corridor. The Improve and Replace

options would have less impact on travel delays than the Remove option, but all three are better in spurring redevelopment within the study area than the Maintain option.

Post-construction congestion costs for the EA options are discussed below.

### Post-Construction Congestion Cost Calculation

To understand the implications of these forecasted travel time delays, City staff prepared a comparative "cost of congestion" analysis for two of the four EA options (Maintain and Remove) using the methodology of a 2008 HDR Corporation study that was undertaken on behalf of Metrolinx. It is important to note that the HDR methodology assessed congestion cost on a system-wide basis in a large area, which was not intended to assess congestion cost for a specific facility. As applied to the Gardiner East study, results indicate little difference in congestion cost among the EA options.

Congestion cost is defined as the difference between the cost to commuters travelling in the peak hours versus in free flow conditions. The congestion cost to auto users consists of delay cost (excess time spent travelling), increased vehicle operating costs, excess vehicle emissions externality costs and excess accident externality costs. The estimated cost to auto commuters is summarized below:

Cost Component	Excess Cost due to Congestion (\$M per year)						
	GTHA		City of Toronto		Gardiner East Study Area		
	2006	2031	2006	2031	2006	2031 Maintain	2031 Remove
Time Cost for auto users	\$2,245	\$5,231	\$988	\$2,218	\$5.3	\$11.9	\$11.7
Vehicle Operating Costs	\$479	\$1,116	\$136	\$317	\$0.7	\$1.7	\$1.7
Cost of Accidents	\$256	\$596	\$73	\$170	\$0.4	\$0.9	\$0.9
Cost of Vehicle Emissions	\$29	\$68	\$8	\$19	\$0	\$0.1	\$0.1
<b>Total</b>	<b>\$3,009</b>	<b>\$7,011</b>	<b>\$1,205</b>	<b>\$2,808</b>	<b>\$6.5</b>	<b>\$14.6</b>	<b>\$14.4</b>

The calculation indicates that the cost of congestion to auto commuters in the Gardiner East study area is approximately \$6.5 million annually. By 2031, the cost increases to \$14.6 million a year under the Maintain option. Under the Remove option, the cost of congestion decreases slightly to \$14.4 million a year as a result of reduced vehicle kilometres of travel in the study area due to the required diversion of trips from auto to other modes, travel times or alternative routes. See Appendix 7: Post-Construction Congestion Cost Calculation for more information.

### **3.6.2 Local Economics**

The EA study looked at business activity, visitor/tourism attractiveness and on three parking. Remove was ranked preferred because it would create the highest number of local jobs (2,120). Also, the alternative would have the highest potential to attract visitors/tourists to the waterfront and create opportunities for off-peak on-street parking.

Replace was ranked moderately preferred because it would create the second highest number of local jobs (1,800); it would attract fewer visitors/tourists and fewer opportunities for off-peak on-street parking. Maintain and Improve were ranked less preferred because they would not create local jobs, attract visitors/tourists or create opportunities for off-street parking.

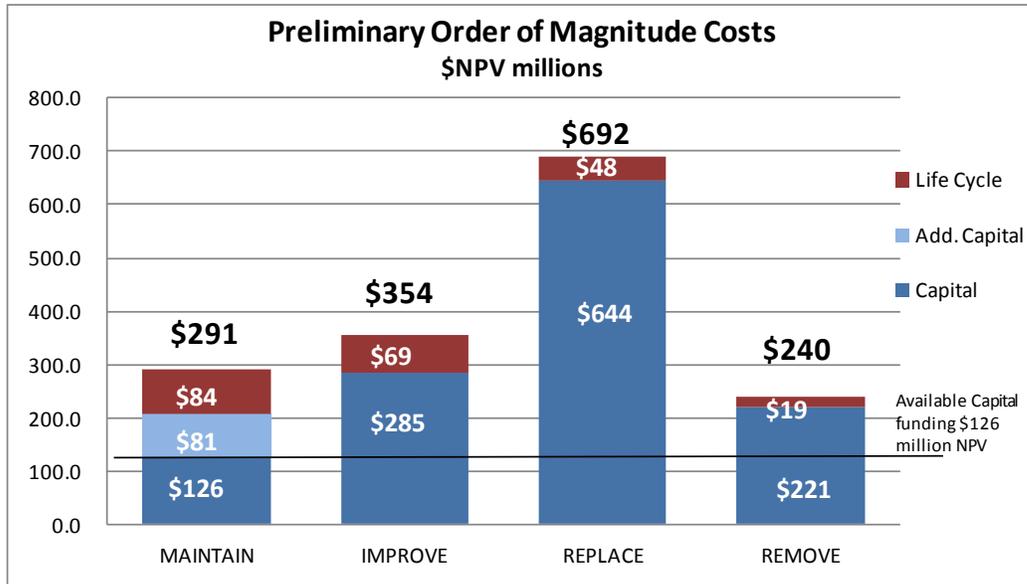
### **3.6.3 Value Creation**

Most of Toronto's development in the downtown core is occurring through land intensification. About 9 hectares of developable land are anticipated through implementation of the Keating Precinct Plan, approved by Council in 2010. This development forms the future 2031 'base case' for all EA options and is not evaluated in the EA study. Additional developable lands above this base case for each EA option have been assessed below by HR&A Consultants.

Under Improve, HR&A estimates \$2 million NPV may be realized through an increase in public land values. For Replace, it is estimated that 2.02 hectares (which could support 176,000 square metres of development) of surplus public right-of-way would generate \$65 to 70 million NPV in revenue. The Remove option will open up the area to more redevelopment at just over 4 hectares (260,000 square metres of development), mostly in the areas currently occupied by the Gardiner right-of-way, for a total of \$80 to 90 million NPV. These figures will be refined during the design stage. Under Remove, the demand for residential use and for employment use will be stronger due to better access to the central business district and to other areas on the east side of the district, as well as due to better physical surroundings. This is demonstrated in the case studies examined in the background reports.

### **3.6.4 Direct Cost and Benefit**

Further to the Financial Impact comments above, capital cost estimates for each of the four roadway configurations were developed, along with longer-term life cycle costs over a 100-year timeframe. As demonstrated in the table below, the Remove option was determined to be the lowest cost alternative on an NPV basis over a 100-year timeframe. Upfront capital costs for Remove are higher, however lifecycle operations and maintenance costs make the alternative the most cost-effective over time. The next lowest NPV cost alternative is Maintain, followed by Improve. The most expensive option is Replace.



These NPV estimates differ slightly from numbers previously presented based on City evaluation of project engineering consultant estimates and the application of the City's discount factors.

Cost estimates do not take into account revenues from the sale of developable land, increase in adjacent land value, property tax revenues that may accrue to the City, or other economic benefits.

Should Council endorse Remove as the preferred EA alternative, a more in-depth market analysis of residential, commercial and retail segments in the EA study area will be completed. This information will supplement the capital construction cost estimate and be used to develop the financing strategy for the preferred alternative.

### Peer Review of Cost Estimates

The City retained Delcan in November 2013 to undertake a peer review of the EA alternative cost estimates prepared by Morrison Hershfield for Improve, Replace and Remove options, as well as City of Toronto estimates for the Maintain Option. Delcan was asked to assess the assumptions, methodologies and level of reliability/accuracy of financial assumptions, cost projections and analysis to date, including lifecycle analysis for all four EA options. Delcan concluded that MH's overall approach to the costing exercise, including unit costs for infrastructure, was appropriate. They found that all assumptions made by the consultant and the City in their calculations were in line with standard practice and that no assumptions were missing.

Based on their analysis, Delcan confirmed that the Remove option is the most cost-effective option in the Gardiner East EA and Replace the least. Since Remove has upfront funding requirements that exceed the current rehabilitation budget, a detailed financing

strategy would be prepared following endorsement of the preferred EA alternative solution and finalization of its cost estimate.

#### **4. Summary of Public Consultation Findings**

Three rounds of consultation on this phase of the EA from May 2013 to February 2014 have engaged several thousand participants in a variety of forums, including in-person and online participation. Public input has been provided on the four alternatives, draft evaluation criteria and the preliminary results of the assessment of alternatives.

The public consultation record from all public meetings held to date is posted online at [www.gardinereast.ca](http://www.gardinereast.ca), and is included at Appendix 5 to this report. Key feedback has included the importance of:

- Balancing modes of transportation;
- Enhancing waterfront connectivity;
- Providing new transportation infrastructure;
- Ensuring transit projects identified in the modeling are prioritized and funded; and
- Enhancing the public realm.

In reviewing the alternatives, the public felt that Remove was cost-effective while creating opportunities for future public parks and greenspace, private development (commercial and residential buildings) and improved accessibility to the waterfront. However, the public was concerned that Remove would cause negative traffic impacts and create a lengthy north-south crossing for pedestrians. Maintain was identified as the least disruptive to traffic, as well as the movement of goods and services, but it was not seen to provide opportunities to revitalize the area. The Improve option was found to provide additional pedestrian and cycling connectivity but at a high cost relative to the benefits, while Replace generated cost concerns. A number of participants did not express clear support for any of the alternatives.

The project team also met with nearly a dozen owners of property adjacent to the eastern expressway, including Metrolinx and First Gulf, to identify issues related to the four Gardiner EA options. Overall, the Remove option was seen as a catalyst for both residential and commercial development in the area, particularly commercial office development. Landowners stressed the importance of public transit access to the success of future development and the need for construction impacts to be considered and minimized wherever possible.

First Gulf's submission to the City's Official Plan Review contemplates a future proposal of up to 10 million square feet of office and retail development in the northeast corner of the Don Valley Parkway and Lake Shore Boulevard. They are interested in ensuring opportunities for future transit, road and expressway access into their site and have identified the Don-Logan off-ramp as a potential barrier to development of the southern portion of their site.

## **5. Planning and Design of Preferred EA Alternative**

This report recommends that City Council endorse Remove as the preferred EA alternative solution. Should Council do so, different design solutions for the preferred solution would be developed over the next year. Engineering design, implementation staging, a traffic management plan, changes to the Official Plan and Central Waterfront Secondary Plan, and mitigation opportunities would be explored prior to completion of the EA, such as travel time, traffic flow, corridor and off-site design improvements, as well as opportunities to accelerate demolition and/or construction.

A more in-depth market analysis of residential, commercial and retail sectors in the EA study area would also be completed to supplement refined capital cost estimates for Remove. Further consultation opportunities to assess alternative designs and solutions would be undertaken.

The final preferred design and associated EA Report would be presented to the public and stakeholders for consideration, then to Committee and Council for approval in early 2015. The EA Report would then be submitted to the Minister of the Environment to initiate the provincial review and approval process as outlined in below. In the event that EA approval is granted, implementation of diversion works would then begin, with construction of the project following directly. The duration of each phase of construction would depend on the final preferred design for Remove that Council endorses in 2015 and the length of time for EA approval.

## **6. MOE Individual EA Review and Approval Process**

The MOE's review and decision-making process for an Individual EA is regulated under Ontario Regulation 616/98 – the Deadline Regulation. Following selection of a preferred EA alternative but prior to Council's final review of the EA Report in 2015, the City and Waterfront Toronto would submit the draft EA Report to the MOE for review. This would ensure that any concerns or technical issues would be identified and addressed early by the EA proponents before a final submission is made to the MOE.

Depending on the complexity of the EA, a decision by the Minister of the Environment can take seven months to several years from the date of submission. The MOE's review process involves opportunities for government agencies, interested persons and Aboriginal communities to review the EA and submit their concerns directly to the MOE. The City and Waterfront Toronto would have an opportunity to review any comments received and advise the MOE about issues raised and how they have been addressed during the EA process or how they can be addressed as part of other regulatory processes.

Final submission of the EA to the MOE requires a minimum of three weeks advance notice. On the date of submission, a Notice of Submission would be published in local newspapers, the project website and the MOE's website. This Notice would provide information about where documents could be viewed, the length of the comment period

and where comments should be submitted. Revisions to an EA after formal submission to the MOE are not normally made and will jeopardize the timelines for a decision.

At the completion of its review process, MOE staff would 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 would also be required. A decision about an Individual EA could take additional time if a judicial 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 will be provided.

Should Council approve the Maintain or "do nothing" alternative, staff would consult with the MOE on withdrawing from the current EA process. Full deck rehabilitation between Jarvis Street and the DVP would be undertaken as scheduled from 2020 to 2025, unless an accelerated model of rehabilitation is adopted.

## **7. Gardiner Expressway Rehabilitation Program, including Jarvis East Interim Repairs**

The City's Strategic Rehabilitation Plan forms the basis of all capital spending to maintain the entire Gardiner Expressway from Highway 427 to Logan Avenue in a safe and operable condition. Capital funding of \$662.7 million, based on a 13-year total cost estimate, was incorporated into Transportation Services' 2014 to 2023 Approved Capital Budget and Plan. Of the 13-year total cost estimates, \$230 million (inflated to year of construction), which is equivalent to \$126 million in net present value (NPV) terms, has been included for the years 2020 to 2025 for full rehabilitation of the Gardiner deck east of Jarvis, which would take six to seven years to complete. Each rehabilitated segment has a projected lifespan of 75 years for the deck and 100 years for the substructure. Ongoing maintenance will be required beyond the 13-year plan.

Pending completion of the EA, Council authorized \$9.1 million in interim repairs for this leg of the expressway. Rehabilitation work began in July 2013 and is scheduled to be completed by December 31, 2014. The scope of work included a combination of temporary bracing, localized deck repairs, and repair/replacement of severely deteriorated parapet walls. The goal is to maintain the existing structure in a safe condition to allow completion of the EA study and implementation of the preferred EA alternative. The need for any further repairs prior to implementation of the preferred EA is reviewed on a yearly basis to ensure the continued safe use of the expressway. A report on a proposed Accelerated Rehabilitation Program is the subject of a separate report to this Committee.

## 8. Conclusions

The areas surrounding the eastern portion of the Gardiner / Lake Shore Boulevard corridor are evolving rapidly from industrial areas into new mixed-use waterfront communities and related public spaces.

Removal of the elevated Gardiner Expressway east of Lower Jarvis Street and its replacement with an extensively landscaped at-grade Lake Shore Boulevard is consistent with the objectives and principles of the City's Official Plan and the Central Waterfront Secondary Plan objectives for Toronto. A number of key City priorities, including flood conveyance and naturalization of the mouth of the Don River, vehicular and transit access to the Port Lands, and development of the Lower Yonge Precinct, East Bayfront and the Port Lands would be addressed.

Deferral of a decision on the EA is not recommended as the Jarvis East segment will require full deck replacement by 2020. In January 2013, Council authorized the completion of interim repairs pending the outcome of the Gardiner East EA, rather than the regularly scheduled full deck replacement, which necessitates a timely and implementable solution for this portion of the expressway.

This report was prepared by the City's Waterfront Secretariat, Transportation Services, Corporate Finance, City Planning, Economic Development, Engineering and Construction Services and City Legal Divisions, in consultation with Waterfront Toronto. Information about the Gardiner East EA, including summaries of public consultations, can be found on the project web site at [www.gardinereast.ca](http://www.gardinereast.ca)

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## SIGNATURE

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John W. Livey F.C.I.P.  
Deputy City Manager

## **APPENDICES:**

- Appendix 1:** Gardiner Expressway and Lake Shore Boulevard East Reconfiguration EA Alternative Solutions Evaluation Interim Report, Dillon Consulting Limited, Perkins+Will, Morrison Hershfield, Hargreaves, HR&A, February 2014
- Appendix 2:** Keating Channel Precinct Block Plan, Keating Channel Precinct Plan, May 2009
- Appendix 3:** Stakeholder Advisory Committee (SAC) Members – Gardiner East EA
- Appendix 4:** Technical Advisory Committee (TAC) Members – Gardiner East EA
- Appendix 5:** Gardiner East EA Public Consultation Milestones and Reports, May 2013 to February 2014, LURA Consulting
- Appendix 6:** Transportation Modelling Considerations, City of Toronto, February 2014
- Appendix 7:** Post-Construction Congestion Cost Calculation, City of Toronto, February 2014