GARDINER EXPRESSWAY AND LAKE SHORE BOULEVARD RECONFIGURATION

Environmental Assessment and Urban Design Study

Draft
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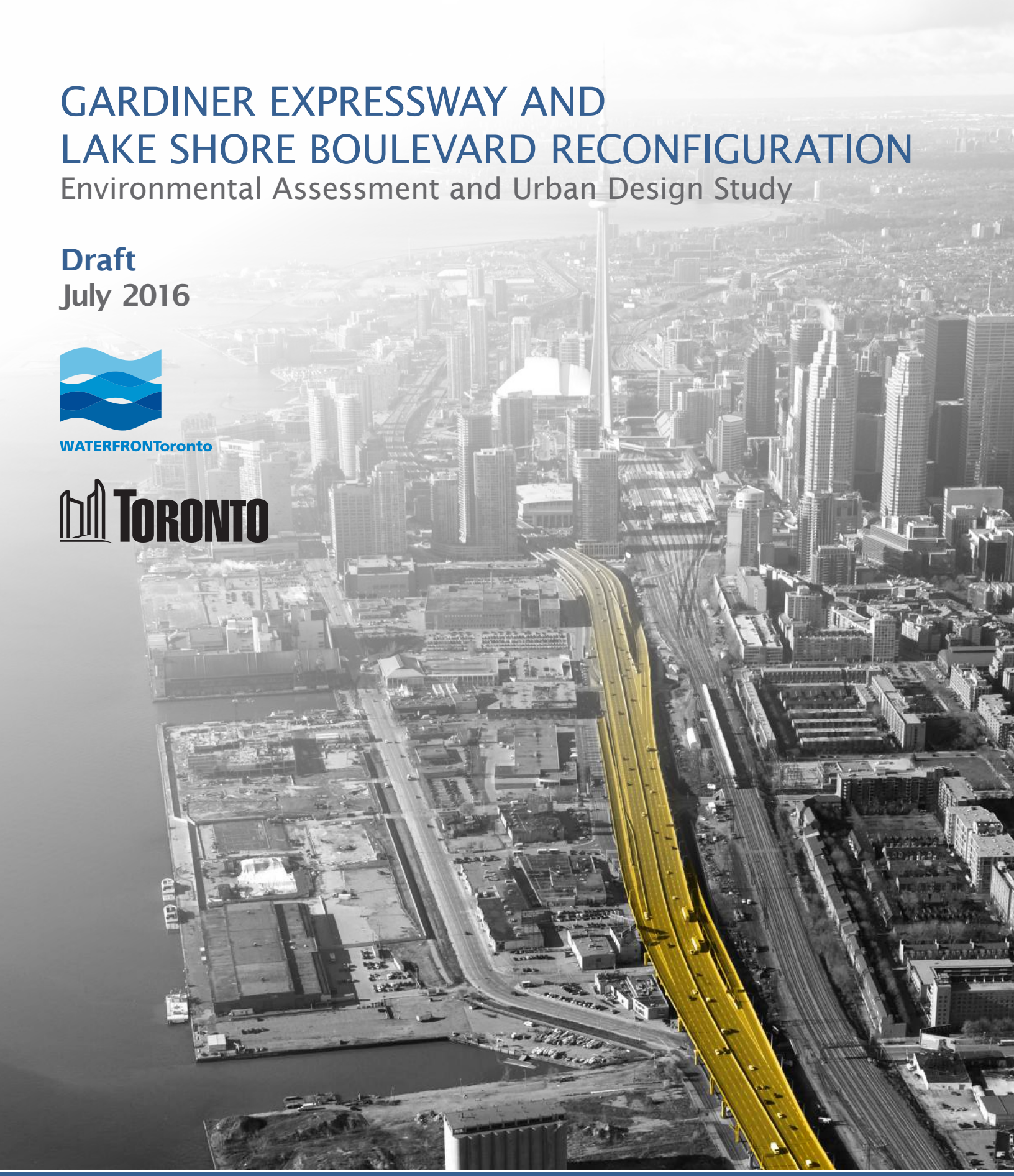
WATERFRONToronto

TORONTO



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Executive Summary

The Gardiner Expressway and Lake Shore Boulevard corridor passes through the City of Toronto's downtown waterfront area to provide one of the most significant transportation corridors in the city. The combined infrastructure of this elevated expressway and major arterial road cuts through many prominent existing and future planned waterfront communities. The transportation connections provided by this infrastructure are important to the economic prosperity of the city, region and province. However, even with these important connections, the Gardiner – Lake Shore Boulevard corridor also presents many barriers in the communities through which the corridor traverses. The size, design and pedestrian/cycling experience of the infrastructure present a barrier between the city and the waterfront. For decades there have been calls to consider reconfiguration options for this corridor that would better balance modes of transportation and create new and improved connections between the city and the lake. More recently, pressures to manage deteriorating infrastructure and invest significant money in the rehabilitation of the Gardiner Expressway have ignited interest to consider alternatives for this infrastructure.

The deck and concrete barriers east of Jarvis Street are in poor condition and are considered to be at the end of their service life. Toronto City Council has authorized $14 million of interim repairs to make this eastern portion of the structure safe and extend its service life to 2020. These repairs consisted of: temporary timber bracing under the deck; localized concrete deck repairs; and repair and replacement of severely deteriorated parapet walls. After decades of uncertainty and

Above: Gardiner Expressway and Lake Shore Boulevard looking west towards downtown.

Above and Below: Gardiner Expressway and Lake Shore Boulevard looking east towards Port Lands.

numerous costly studies on the future of the Gardiner/Lake Shore corridor, agreement and decisive action are needed with respect to the eastern segment of the expressway, which has considerable potential for redevelopment and positive change.

Waterfront Toronto and the City of Toronto (City), the project co-proponents, have jointly undertaken an Individual Environmental Assessment to determine the future of the eastern portion of the elevated Gardiner Expressway and Lake Shore Boulevard from approximately Lower Jarvis Street to approximately Leslie Street. The process has led to the identification of a Hybrid option (Hybrid #3) as the preferred undertaking.

The study process is made up of two overarching components:

1. An Environmental Assessment (EA) pursuant to the Ontario *Environmental Assessment Act* to assess proposed changes to the existing eastern section of the elevated Gardiner Expressway and Lake Shore Boulevard; and
2. An urban design review that yields a vision for the future of the area occupied presently by the eastern section of the elevated Gardiner Expressway and Lake Shore Boulevard.

This unique integrated study process has focused on completing a thorough technical analysis and generating a preferred undertaking that is rooted in strong city-building objectives.

This study followed an Individual EA process, as detailed in **Chapter 1** of this report. This draft EA Report represents a complete record of the Individual EA study that was completed for the Gardiner Expressway and Lake Shore Boulevard East Reconfiguration EA and Urban Design Study (referred to as the Gardiner East Project) and which led to the identification of a preferred undertaking by Toronto City Council in March 2016. This draft EA Report is being released for public and stakeholder review and comment (June 2016). The final EA Report is expected to be submitted to the MOECC in Summer 2016.

The future of the Gardiner Expressway has been the subject of study since its construction in the 1950s and 1960s. The Frederick G. Gardiner Expressway was built at a time when Toronto's central waterfront was not a civic waterfront destination as it exists today, but rather considered a heavy industrial area and transportation corridor, providing the City with goods and materials.

Rendering of preferred undertaking.

Since the late 1980s, the City of Toronto has taken interest in enhancing public access to and from the waterfront by reducing the waterfront barrier effect associated with the alignment, footprint, and ramp locations of the Gardiner Expressway through the downtown area. Key City planning polices, plans and initiatives support this including the Official Plan, Central Waterfront Plan, various waterfront renewal activities and recent fresh looks at the waterfront and its role in the City's growth, economy and quality of life development. In 1996, planning and an EA process were undertaken for the removal of a 1.3 kilometre section of the Gardiner east of the Don River, between Bouchette Street and Leslie Street. The removal of this section of the Gardiner was completed in 2001.

From 2004 to present, Waterfront Toronto has been working in collaboration with the City on the commissioning of several reports that studied the impact of various options for the future of the Gardiner. In 2008, Toronto City Council approved Waterfront Toronto's proposal to undertake an Individual Environmental Assessment regarding the eastern section of the elevated Gardiner Expressway, east of Jarvis Street. Council identified the need to also study the reconfiguration of Lake Shore Boulevard in the same area so as to comprehensively determine the function and feel of the corridor in the future.

Dillon Consulting Limited was awarded the assignment to lead the completion of the Gardiner East Project. This study commenced in 2009 with the Terms of Reference (ToR) which was approved by the Ministry of the Environment (now the Ministry of the Environment and Climate Change) in November 2009. The ToR set the direction for the EA study from inception. This EA report presents the complete study process, approach, findings and recommendations for the future of the Gardiner East following an Individual EA study process.

Phase 1 – Terms of Reference (ToR)

Phase 1 of the study included the aforementioned ToR (a copy of which can be found in **Appendix A**) and the establishment of project goals and principles to guide the development and evaluation of alternatives. The ToR established four study lenses through which this EA has been prepared: Transportation and Infrastructure, Urban Design, Economics and Environment. As well, four families of alternatives were identified in the ToR including: Maintain, Improve, Replace and Remove. These families of alternatives provided the framework for the development of the alternative solutions in Phase 3 of the EA. The ToR also included an outline of the consultation program and objectives. Consultation for the EA study focused on multiple levels of engagement throughout the study process with the public, stakeholders, landowners, agencies, technical municipal staff, and Aboriginal communities. The consultation program was managed by an independent Consultation Consultant and Facilitator, LURA Consulting. A full

report of the consultation activities undertaken throughout the EA study is provided in Chapter 7 of this report.

During the preparation of the ToR, the project team also completed a review of what other cities around the world have done to address similar aging highway infrastructure in urban centres. Many North American cities are facing similar challenges today, with infrastructure that is now more than 50 years old that requires significant investment to maintain. Cities are faced with the question as to whether maintaining and rehabilitating the infrastructure is the best investment for the city and its growing urban population. The project team reviewed and considered these case studies to identify opportunities and challenges that could be applied to the Gardiner East Project.

Phase 2 – Baseline Conditions and Ideas Generation

Phase 2 of the study focused on establishing a thorough understanding of the complex study area. Chapter 3 of this Report describes the baseline conditions including, for example, land use and urban design, environmental, economic, cultural resources, and infrastructure.

The Gardiner East extends through an area of the waterfront that is undergoing extensive transformation. As part of Toronto's waterfront revitalization initiative, many of the historical industrial uses in the area are changing into complete mixed-use communities not only with new population and employment growth, but with new servicing, infrastructure, public spaces and amenities. The planning process for many of the communities in the study area is still underway and as such, the project team needed to understand two conditions for assessment: the existing baseline conditions that consider what is on the ground and functioning in the study area today (based on 2013 reporting); and a future condition that depicts what the study area will be like once the undertaking is fully operational (a 2031 condition) and surrounding land use has been built-out.

Also completed during Phase 2 was a "Design Ideas Competition" in which four different international design teams submitted their vision on the families of alternatives. The ideas generated through this exercise provided inspiration for the development of the alternative solutions in Phase 3.

Phase 3 – Alternative Solutions

Phase 3 of the study focused on the development and evaluation of four alternative solutions: Maintain (or "Do Nothing"), Improve, Replace, and Remove (or Boulevard). The process of developing the alternatives involved the consideration of the study goals, baseline conditions, the results of the 'Design Ideas Competition" and public, stakeholder and agency input.

Extensive consultation was undertaken during Phase 3 over the course of two years. The evaluation of the alternative solutions involved extensive technical work including the completion of traffic modelling to forecast future travel times associated with the alternatives. **Chapter 4** of this report describes this study phase.

The evaluation of alternatives was based on an extensive set of evaluation criteria organized on the basis of the four study lenses. The initial evaluation of alternative solutions resulted in the identification of the Remove alternative as the technically preferred alternative. This technical recommendation was then reviewed by the City of Toronto Public Works and Infrastructure Committee (PWIC) which requested additional mitigation of auto travel time impacts associated with Remove as well as the development and evaluation of an additional alternative solution – the Hybrid. The Hybrid concept involved maintaining a continuous freeway connection between the Gardiner and the Don Valley Parkway (DVP), removing the elevated expressway (Logan Ramps) east of the Don Roadway, and realigning Lake Shore Boulevard as per the Keating Channel Precinct Plan.

Several concepts for the Hybrid alternative were explored with the preferred concept involving: the removal of the Logan ramps, maintenance of the existing expressway connection with the DVP, creation of new access ramps just east of Cherry Street, and the realignment of Lake Shore Boulevard, between Cherry Street and the Don River.

As directed by PWIC, the study team was able to optimize the Remove (Boulevard) alternative to reduce peak period auto travel times, although travel times were generally still 2-3 minutes more than the Hybrid Alternative. The optimization largely involved traffic operation type modifications including traffic signal timing adjustments and controlling of turns at key intersections as well as some lane configuration adjustments. The Hybrid alternative solution was then evaluated against the optimized Remove (Boulevard) alternative in a final paired comparison considering a similar set of criteria used to compare the four alternatives solutions. In completing the evaluation, consultation was undertaken with the public agencies, and stakeholders.

The advantages and disadvantages of both alternatives were presented. The Hybrid alternative was identified to be preferred on the basis of the Transportation and Infrastructure lens while the Remove (Boulevard) was preferred on the basis of the Urban Design, Economics and the Environment lenses. Considering the evaluation results, both alternatives facilitate:

- Revitalization of the Don River Mouth and Flood Protection project;
- Development of the First Gulf site; and

- Implementation of new public transit projects.

However, there are differences in the benefits between the two alternatives, including:

- **Remove (Boulevard)** represents a lower cost, higher revenue to the City from public land redevelopment, creation of a lively Lake Shore Boulevard, facilitates better connections to the waterfront and is to result in less greenhouse gas emissions.
- **Hybrid** maintains an expressway connection function and level of service between the Gardiner and Don Valley Parkway, has lower auto travel and goods movement times, and less construction disruption.

The decision as to which of these two alternatives should be recommended as preferred was found to be difficult. Opinions on the alternatives were highly divisive with some feeling that the Gardiner infrastructure is integral to the City's transportation system while others noted that the Gardiner East is out-dated infrastructure that largely only serves as a DVP ramp to the downtown core and beyond and presents an obstacle between the city and the waterfront.

This decision required a trade-off between two very important and related City priorities: traffic congestion and City building/prosperity (understanding that traffic congestion is a product of City growth and prosperity). There was not a strong technical case to select one alternative over the other. With or without the Gardiner, the waterfront/downtown core will grow just as it has in the recent past, and traffic congestion in the City will increase – even with new transit projects being developed. Both the Hybrid and Remove alternatives are technically viable while offering different advantages and disadvantages.

City Council reviewed and considered the technical evaluation results at their June 10-12, 2015 meeting. Primary issues discussed and debated during that meeting included: the merits of preserving a continuous elevated Gardiner-DVP freeway; an acceptable level of impact on road capacity and travel times; findings of goods movement and economic competitiveness studies, capital and lifecycle cost comparisons; applicable City of Toronto Official Plan policies, and various waterfront revitalization initiatives; and potential for impact to the parks, open spaces and development opportunities identified within the Keating Channel Precinct Plan. After significant Council debate on the advantages and disadvantages of the two alternative solutions, City Council endorsed the Hybrid as the preferred solution and further directed City staff to develop and evaluate alternative Hybrid designs.

Phase 4 – Alternative Designs

Phase 4 of the study focused on the development and evaluation of alternative designs for the preferred Hybrid solution identified through the Phase 3 work and is described in detail in **Chapter 5** of this EA Report. Various alternative designs were examined that included the consideration of: ramp design speeds, alignments, need for new access ramps, and ways to cross the rail corridor including a possible fly-over design. During this phase two other concepts were examined as suggested by members of the public: The Green Gardiner Concept and the Viaduct Concept. These alternatives helped to inform the development of Hybrid alternative designs, including consideration for improved green spaces and the utilization of neglected space on the north side of Lake Shore Boulevard adjacent to the rail berm.

Ultimately, three alternative Hybrid designs were developed and carried forward for assessment. All three designs include the same more northern realignment of Lake Shore Boulevard through the Keating Channel Precinct and the removal of the Logan Ramps east of the Don River. The alternative designs include:

- Hybrid 1 – Maintaining the existing Gardiner-DVP connection and build new access ramps near Cherry Street.;
- Hybrid 2 – Removal of the existing Gardiner-DVP connection and rebuilds it through the Keating Channel Precinct further north of Hybrid 1 with a new "tighter" ramp connection to the Don Valley Parkway; and
- Hybrid 3 – Removal of the existing Gardiner-DVP connection and rebuilds the connection along an alignment close to the rail corridor that is even further north than Hybrid 2. This design also requires the lengthening of the Metrolinx Don River/DVP rail bridge.

For all of the Hybrid alternatives, the Gardiner west of Cherry Street is to be maintained and rehabilitated according to a Gardiner Strategic Rehabilitation Plan managed by the City of Toronto's Transportation Services and Engineering & Construction Services divisions. Further, no substantial infrastructure changes to Lake Shore Boulevard west of Cherry Street are proposed as part of the undertaking.

The three Hybrid designs were then evaluated on the basis of a comprehensive set of evaluation criteria based on the four study lenses. Through the evaluation it was determined that Hybrid Design Alternatives 2 and 3 are more desirable for the Transportation, Urban Design and Environment lenses. Alternative 3 is more desirable than Alternative 2 for Urban Design and Environment. However, Alternative 3 is more expensive than Alternative 2, with an additional

capital cost of approximately $31million net present value (NPV). Comments and input received through public and stakeholder consultation, including online and in-person meetings, indicate a preference for Hybrid design Alternative 3.

Considering the identified trade-offs among the Hybrid design alternatives and the input received from stakeholders, Hybrid Design Alternative 3 was recommended as preferred. In March 2016, Toronto City Council reviewed and endorsed the Hybrid 3 recommendation.

Phase 5 – Effects Assessment and Mitigation

In Phase 5, the Hybrid 3 preferred design is described in further detail to present the proposed undertaking for which approval from MOECC is being sought. **Chapter 6** presents the results of this work. The proposed undertaking includes:

1. The removal of the existing Gardiner Expressway east of Cherry Street and the construction of a new expressway link with the Don Valley Parkway.
2. The construction of a realigned Lake Shore Boulevard from Cherry Street to Don Roadway with new ramps to and from the Gardiner Expressway.
3. Reconstruction of Lake Shore Boulevard east of the Don River to Logan Avenue including a reconstructed Don River bridge.
4. Public Realm Improvements that will extend the full length of the corridor from Jarvis Street to Leslie Street.

An effects assessment of the undertaking has been completed for both the near term construction period (2020 -2025) and for the long term operation period (2031 and beyond). The assessment of the undertaking was based on a set of criteria and measures that were developed by the City, Waterfront Toronto, and the Consulting Team to reflect the study area, project characteristics and the input received from stakeholders through the course of the EA study. In completing the assessment of effects, mitigation measures have been identified to minimize or reduce the identified adverse environmental effects. These identified mitigation measures form part of the commitments for this undertaking. The criteria reflect the four study lenses, Transportation and Infrastructure, Urban Design, Economics and Environment, and are organized on the basis of the following criteria groups:

- Transportation
- Public Safety
- Planning and Urban Design
- Social and Health

- Natural Environment
- Cultural Resources
- Economics

Where necessary and appropriate, mitigation and monitoring commitments are identified and net residual effects determined. In completing the effects assessment, consideration was given to climate change, cumulative effects and effects on source water protection areas.

As documented in this EA Report, both the City and Waterfront Toronto have programs in place to reduce effects on climate change. This EA has considered potential effects on climate change and effects from climate change. Considering the potential for effects on climate change, the project:

- Does not contribute to an increase in automobile use. With the removal of the Logan Ramps, there is a small reduction in road capacity that might provide incentive for commuters to use alternative modes of transportation;
- Includes the provision of a new multi-use pathway along Lake Shore Boulevard providing a new cycling route into the downtown area providing further incentive for commuters to use alternative modes of transportation;
- Includes significant new plantings of trees within the roadway corridor;
- Complements if not enhances the opportunities for future Waterfront Transit; and
- Enhances new development lands close to the downtown core, reducing long distance commuting requirements for some.

Regarding effects from Climate Change, the project by its nature is not considered to be overly susceptible to changing climate conditions and certainly is not any more susceptible than the future Do Nothing baseline condition. The project will be constructed using more advanced materials to withstand weather effects and extend the lifespan of the infrastructure. Further, the project will be designed to withstand extreme weather events, more frequent freeze/thaw cycles, and to better withstand the effects of roadway salting (chlorides) which is a major contributor to the deterioration of concrete and steel reinforcements. The design will also manage more intense rainfall events through the use of bio-retention and Low Impact Development within the rights-of way.

The overall advantages and disadvantages of the Gardiner East project were also determined and compared against the “Do Nothing” Alternative. As documented in this EA Report, most of the project’s negative effects will occur during the construction period and, as such, will be

temporary. Adverse effects on the natural environment are minimal considering the low quality of existing habitat in the project vicinity. Similarly, there are few negative social impacts due to an absence of receptors in the project area. The most notable effects are increased travel times for commuters during project construction when road closures will occur and travel between the downtown and the northern and eastern parts of the city will be affected. Once the project is constructed and operational, the only negative effects of note are the increase in travel time for auto commuters between the downtown and the east during peak travel periods (average increase of 3 minutes in the AM peak hour). It is noted that 90% of downtown commuters will not experience any change in their peak period travel time as a result of the implementation of the project. To manage impacts during construction and operation, Waterfront Toronto and the City are committed to ongoing coordination with other projects in the surrounding area and with agencies and stakeholders including Metrolinx and the Toronto and Region Conservation Authority.

In contrast, the project offers many city building advantages and fulfills in some measure all of the study goals as defined in the EA ToR. Further, the public has indicated support for Hybrid 3 (as the preferred alternative design). City of Toronto Council and the Waterfront Toronto Board of Directors have provided their support for the project.

In conclusion, the negative net effects of the Gardiner East Project, many of which will occur during construction and are temporary, are considered to be offset by the positive contributions of the project. These include:

- The opportunity to redevelop the Keating Channel Precinct with direct access to the water;
- The creation of new public realm space, contributing to the creation of a better connected waterfront, improved pedestrian and cycling experience, and complementing other major projects such as the Don Mouth Naturalization Project and Port Lands development;
- The accommodation of major private sector development projects including the First Gulf development; and
- The promotion of alternative modes of transportation through the provision of a new multi-use pathway.

Next Steps

Key next steps for this project include:

- Finalization of the EA Report taking into account public and agency comments received on this draft EA report.
- Submission of the final EA report to MOECC for its review and approval decision;
- Development of a detailed design for the undertaking as well as construction staging plans that include the consideration of the designs and construction sequencing of other planned projects in the study area.
- Completion of a Public Realm Phasing and Implementation Strategy for the implementation of public realm and urban design recommendations that will be phased with the implementation of other planned and emerging developments along the corridor.
- Review the Keating Channel Precinct Plan to reflect the Gardiner East EA undertaking.
- Construction and effects monitoring of the undertaking.

List of Acronyms

Acronyms	Definition
BMP	Best Management Practice
City	City of Toronto
CWSP	Central Waterfront Secondary Plan
DMNP	Don Mouth Naturalization Project
DVP	Don Valley Parkway
EA	Environmental Assessment
EAA	Environmental Assessment Act (Ontario)
ESC	Erosion and Sediment Control
ESR	Environmental Study Report
FGE	Frederick Gardiner Expressway
GHGs	Green House Gases
LCCA	Lifecycle Costing Analysis
LEED	Leadership in Energy and Environmental Design
LRT	Light Rail Transit
LSB	Lake Shore Boulevard
MAA	Ministry of Aboriginal Affairs (Ontario)
MOECC	Ministry of Environment and Climate Change (Ontario)
MTCS	Ministry of Tourism, Culture and Sport (Ontario)
MTO	Ministry of Transportation Ontario
NPV	Net Present Value
OD (pairs)	Origin-Destination Pairs
PWIC	Public Works and Infrastructure Committee (City of Toronto)
RER	Regional Express Rail
TDM	Transportation Demand Management
TRCA	Toronto and Region Conservation Authority
TSMP	Transportation and Servicing Master Plan

Acronyms	Definition
TWRC	Toronto Waterfront Revitalization Corporation (now Waterfront Toronto)
WT	Waterfront Toronto
WWFMP	Wet Weather Flow Management Plan

Contents

List of Figures

List of Tables

List of Appendices

1.0 Introduction

Waterfront Toronto (WT) and the City of Toronto (City), the project co-proponents, have jointly completed an Environmental Assessment (EA) study to determine the future of the elevated Gardiner Expressway and Lake Shore Boulevard East from approximately Lower Jarvis Street to approximately Leslie Street. The EA study was undertaken in a manner that fully integrated environmental, technical and urban design considerations.

The project co-proponents conducted the study as an Individual EA that involved the preparation of a Terms of Reference (ToR). The ToR set out the study process to be followed in conducting the EA study, including a description of how the public, stakeholders (interest groups), Aboriginal communities, and agencies were to be consulted. The ToR was completed in September 2009 and approved by the Ministry of Environment and Climate Change (MOECC) on November 30, 2009. A copy of the approved ToR is provided in **Appendix A**.

This EA was prepared in accordance with the Ontario *Environmental Assessment Act* as well as in accordance with the provincial *Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario, January 2014*.

This draft EA Report represents a complete record of the Individual EA study that was completed for the Gardiner East Project and which led to the identification of a preferred undertaking. This draft EA Report is being released for public and stakeholder review and comments (June 2016). The final EA Report is expected to be submitted to the MOECC in summer 2016.

1.1 Historical Background

The Frederick G. Gardiner Expressway was constructed at a time when Toronto's downtown waterfront was still considered a heavy industrial area, providing the City with goods and materials but not a civic waterfront destination. In 1955, after more than a decade of planning, construction began on the at-grade segments of the Gardiner Expressway west of the City. In 1958, construction began on the elevated segments from Dufferin Street through the central downtown area, reaching

1958: Building of the Gardiner Expressway, routed through industrial waterfront.

York Street by 1962, the DVP by 1964, and finally Leslie Street by 1966.

The route of the Gardiner Expressway required the conversion of substantial amounts of parkland, including Sunnyside Amusement Park, removal of the Jameson Avenue portion of the Parkdale residential neighbourhood, and elimination of many local access routes to the waterfront. It also necessitated the complete reconfiguration of Lake Shore Boulevard through the central downtown to allow the Gardiner Expressway to be built above it. In the process, Lake Shore Boulevard changed from a tree-lined waterfront avenue to an expressway collector route.

The future of the Gardiner Expressway has been the subject of study since its inception in the 1950s. Since the late 1980s, the City of Toronto has taken interest in reducing the waterfront barrier effect associated with the alignment, footprint, and ramp locations of the Gardiner Expressway through the downtown area. In November, 1991 the Royal Commission on the Future of the Toronto Waterfront produced "Report 15: The Toronto Central Waterfront Transportation Corridor Study" that looked at three feasible, generic concepts for the treatment of the elevated Gardiner Expressway between Dufferin and Leslie Streets:

1. Retain (and ameliorate);
2. Remove (and add some additional at-grade road capacity), and/or
3. Bury (put the expressway in a tunnel).

The study recognized that combinations of the three alternatives are possible reflecting different conditions along the corridor. Report 15 did not immediately recommend a single, preferred option but proposed a phased implementation process in which Stage 1 would move towards the stated "vision" while "keeping open the option of retaining or removing the central section of the expressway" (p. 110). The Commission's final report, "Regeneration: Toronto's Waterfront and the Sustainable City" (1992), concluded that: "It is both feasible and desirable to relocate and redesign the expressway and Lake Shore Boulevard as part of an integrated and phased plan to improve the Central Waterfront". To this end, the Commission put forward Recommendation 65 that the Province and relevant municipalities negotiate a Waterfront Partnership Agreement to implement Stage 1 of the program to integrate environment, land use and transportation in the Central Waterfront.

As a first step, the need for the 1.3-kilometre elevated segment of the Gardiner from just west of the Don River to Leslie Street was assessed by the former Municipality of Metropolitan Toronto. Between 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 as far west as Strachan Avenue, with the section between Strachan Avenue and Spadina Avenue being replaced in a tunnel. On August 1, 2000, Council considered the staff report "Our Toronto Waterfront – Building Momentum" and endorsed, in principle, the Task Force concept plan, and directed the City's Chief Administrative Officer to initiate a discussion with Federal and Provincial governments and report back on a preferred model for a new waterfront development governing body.

In considering an October 17, 2002 staff report entitled "Review of the Gardiner/Lake Shore Corridor Proposal Contained in the Central Waterfront Secondary Plan" in February 2003, City Council approved a "scoping study" to identify Terms of Reference limited to a "retain and ameliorate" strategy for the Gardiner/Lake Shore Corridor, backing off from a staff recommendation to undertake a full EA of three options related to the elevated Gardiner east of Strachan which suggested assessing options to Retain, Replace or Remove.

City Council approved the "Central Waterfront Secondary Plan: Making Waves" in April 2003. The Plan sets out the guiding principles for revitalizing a 10-kilometre designated waterfront area between Dowling Avenue and Coxwell Avenue, including key public priorities, opportunities and an implementation process. Reconfiguration of the Gardiner Expressway is one of 23 Big Moves identified in the plan.

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.

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.

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 additional costs for an underground portion 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 (east of Jarvis Street). In July 2008, City Council authorized the City and Waterfront Toronto to jointly undertake an Individual EA for the Gardiner East. This EA fulfills the Council authorization to complete an Individual EA for the Gardiner East.

1.2 Project Proponent and Study Team

The City of Toronto and Waterfront Toronto are co-proponents of this project, and this EA study was prepared under their direction. The consulting team was led by Dillon Consulting Limited and included the firms of Morrison Hershfield, Perkins+Will, Hargreaves Associates, HR&A Advisors, Archaeological Services Inc., CPCS, Sam Schwartz Engineering, and, Cushman & Wakefield. In addition, LURA acted as an independent consultant to Waterfront Toronto and the City to manage the public and stakeholder consultation program.

1.2.1 Waterfront Toronto's Mission

Waterfront Toronto was established by the Government of Canada, the Province of Ontario and the City of Toronto as the "Toronto Waterfront Revitalization Corporation" in 2001 to lead and oversee the renewal of Toronto's waterfront. Waterfront Toronto has jurisdiction over a portion of the lands that extend from Ontario Place in the west to Ashbridges Bay in the east. This area is about 810 ha in size, making it one of the largest urban redevelopment opportunities in North America.

Waterfront Toronto's mandate is to put Toronto at the forefront of global cities in the 21st century by transforming the waterfront into beautiful and sustainable communities, fostering economic growth in knowledge-based, creative industries, and ultimately redefining how Toronto, Ontario, and Canada are perceived by the world. A core part of that mission includes building high-quality public infrastructure, including parks, promenades, boulevards, and other amenities needed to generate vibrant urban activity.

1.2.2 City of Toronto's Waterfront Objectives

The vision in the City of Toronto's Official Plan is for a more liveable city created by integrating future growth with viable transportation and green space networks. The Central Waterfront area is guided by the policies and direction of the Official Plan, the Central Waterfront Secondary Plan, and numerous other reports, studies and precinct plans, which direct city staff to seek the improvement of the public realm and the pedestrian environment and to provide for improved physical and visual access to the waterfront. A reduction in auto dependency and a greater reliance on walking, cycling and transit is a key principle when considering modifications to roadways.

Multiple divisions and departments take carriage of implementing the City of Toronto's waterfront objectives, and have likewise provided leadership and strategic direction throughout the Gardiner East EA and Urban Design Study process to ensure alignment with broader waterfront revitalization goals. This interdivisional effort included City Planning (Waterfront Secretariat, Transportation Planning, Community Planning, and Urban Design), Transportation Services, Engineering and Construction Services, Financial Planning, and Parks, Forestry and Recreation.

1.3 Rationale for the Undertaking (Project Goals)

A set of project goals were developed during the ToR phase of work in 2009 to provide guidance for the project and to communicate the promise of the project to the larger community. These goals informed the 'undertaking' and provided guidance and direction to the study and project. In particular they provided guidance to the development of the alternative solutions and designs, the criteria used to evaluate the alternatives, and the design of the project or 'undertaking'.

The project goals were developed considering Waterfront Toronto's guiding principles, the City's Official Plan and Central Waterfront Secondary Plan, and with public and stakeholder input.

Waterfront Toronto's guiding principles include:

- Sustainable development;
- Public accessibility;
- Economic prosperity;
- Design excellence; and,
- Fiscal sustainability.

The Toronto Official Plan (which is consistent with the Province's Growth Plan for the Greater Golden Horseshoe) is both visionary and strategic and focuses on opportunities for renewal and reinvestment. Key "themes" from the City's Official Plan include:

- Promoting growth that is less reliant on the private automobile;
- Developing transit-based growth strategies that support development in areas with good transit and improve transit in major growth areas;
- Emphasizing environmentally sustainable development;
- Having design policies to guide the physical form of development and public realm improvements; and,
- Ensuring the social and environmental infrastructure is in place to serve Toronto's present and future residents.

The City's Central Waterfront Secondary Plan provides policies for future road patterns, transit routes, natural areas, regeneration areas and redevelopment areas. The plan has four core principles which act as a framework for waterfront renewal activities:

- Removing Barriers and Making Connections;
- Building a Network of Spectacular Waterfront Parks and Public Spaces;
- Promoting a Clean and Green Environment; and,
- Creating a Dynamic and Diverse Community.

Each core principle is accompanied with a series of "Big Moves" that will define the Central Waterfront. Of these principles, Removing Barriers and Making Connections is particularly significant to the Gardiner Expressway and Lake Shore Boulevard reconfiguration. This principle includes Big Moves for "Redesigning the Gardiner Corridor" and transforming Lake Shore Boulevard into "An Urban Waterfront Avenue." The plan states that the final configuration will depend on the outcome of a detailed study. The plan also includes policies for a new waterfront transit network, the prioritization of sustainable modes of transportation, the remaking of waterfront streets into "places" with distinct identities, and the implementation of a standard of excellence for the design of public realm and built form.

As outlined in the ToR, the project team developed the following five goals for the undertaking which are discussed below:

1. Revitalize the waterfront
2. Reconnect the city with the lake
3. Balance modes of travel
4. Achieve sustainability
5. Create value

Goal 1: Revitalize the Waterfront

Water's edge promenade, East Bayfront.

In its current form, the elevated Gardiner Expressway has become an eyesore. Its structural column grid, on- and off-ramp network, and architectural detailing were never intended to create a great public realm, but rather to carry vehicles past the waterfront area. A public realm that provides adequate access to open space, landscape, light and air, and contributes to the revitalization of the waterfront needs to be created. The project should:

- Prioritize urban design excellence, place-making, and quality of life as integral components of project design and evaluation;
- Contribute to the creation of the waterfront as a regional/tourist destination;
- Rejuvenate the underutilized and derelict lands under and adjacent to the expressway;
- Balance provision of new amenities for both local and regional users recognizing that local and regional stakeholders may value amenities and infrastructure in different ways;

- Build on existing planning initiatives and conclusions. The EA study will coordinate and seek opportunities of mutual benefit with those initiatives; and,

- Acknowledge this project as an opportunity for city-building. Evaluate city-building investments, outcomes, and benefits in local, regional and global contexts.

Goal 2: Reconnect the City with the Lake

East Bayfront redevelopment supports connections between the city and the lake.

The Gardiner Expressway and Lake Shore Boulevard pair have long been perceived as a barrier that disconnects the downtown from its waterfront. The railroad viaduct is a physical barrier, limiting waterfront area access to four underpasses. When combined these two facilities form a gap in the urban fabric. This gap needs to be addressed through street design, local transit, public realm, and mixed-use development strategies that enhance waterfront connections to downtown. Any reconfiguration of the Gardiner Expressway will need to include welcoming and accessible routes to the waterfront, breaking down the psychological and physical barriers that exist today and replacing them with inviting and engaging experiences. The project should:

- Create physical, visual and cognitive connections to the waterfront for downtown, the City, and region. The waterfront is an amenity that belongs to and should be accessible to the public;

- Design the public realm to be attractive, accessible and connected. The qualities of experience offered by streets, plazas, parks, promenades, pathways, bicycle routes

and visual corridors will be major drivers of design decisions. Public spaces should be accessible and perceived as public; and,

- The new urban fabric should become a connector between the downtown and new waterfront communities, one that uses transit, street design and new mixed-use communities to stitch the city with its unique waterfront experience.

Goal 3: Balance Modes of Travel

Reconfiguration of Queens Quay Boulevard West.

Any new configuration of the Gardiner Expressway will need to maintain an effective local and regional transportation system, including commuters and freight, and minimize negative impacts by balancing alternative travel modes, including transit (local and regional), cycling and walking within the system. Further, over the coming decades it is expected that there will be decreased dependence on the private automobile and an increase in the use of active public modes and transit. This is due to a combination of factors, including lifestyle changes that are drawing people back downtown; increasing fuel prices; and climate change as people seek to reduce their "carbon footprint". The project should:

- Acknowledge transportation initiatives for their impact – both positive and negative – on regional economic competitiveness, land-use, development character, settlement patterns, and environmental issues such as air quality and ambient noise;
- Maintain reliable access to the City and its neighbourhoods for local residents, commuters, freight trucks and regional travellers. The corridor plays an important role

in the movement of traffic through the City and larger region. The reconfiguration alternatives will address the through-traffic function of the Gardiner Expressway and Lake Shore Boulevard;

- Acknowledge and integrate other planned transit initiatives (local and regional) being proposed for the City; and,
- Consider a combination of supply, system and demand management measures. Creatively maximize the performance of infrastructure through management and operation.

Goal 4: Achieve Sustainability

Lower Don Lands and Don River Mouth revitalization.

This project should advance the City's and Waterfront Toronto's commitment to green, healthy and energy efficient development. Sustainable design solutions can improve environmental quality and biodiversity, and minimize public health risks. The project should:

- Consider Waterfront Toronto's and the City's sustainability policies and frameworks;
- Help contribute to development that has an overall positive impact. These benefits are to result in environmental enhancements, economic security and social/cultural gains.
- Contribute to the improvement of environmental quality and public health, including air quality;
- Complement, if not enhance, other waterfront environmental naturalization initiatives;

- Accommodate the plans for flood conveyance and flood protection to lands in the Don River mouth area, the Port Lands and south Riverdale community;
- Promote social engagement and interaction;
- Promote the City's initiatives to reduce greenhouse gas emissions;
- Promote public awareness and education on environmental issues through the physical design of infrastructure and public realm; and,
- Integrate ecology and natural systems with urbanism.

Goal 5: Create Value

The future reconfiguration of the Gardiner Expressway and Lake Shore Boulevard can act as a catalyst for good development and contribute to an integrated, vibrant and successful waterfront. Further, any changes to the Gardiner Expressway and Lake Shore Boulevard pair will require a significant public investment, whether in rehabilitation and enhancement of the existing structure or replacement with a new or alternative facility. That investment should be targeted to maximize opportunities for revitalization, and to leverage the economic benefits of the project, rather than simply preserving the single purpose Gardiner Expressway. The project should:

Monde Condominiums Development rendering, East Bayfront.

- Plan and design for positive net value creation in local, regional and global contexts;
- Define a public and private investment structure that creates and captures value for the public sector, through these city-

building initiatives, creates value for the community, in terms of streets, open space, and catalysts for private development; and,

- Maximize net economic and environmental benefits.

All five project goals have informed the generation and evaluation of both the alternative solutions and the alternative designs for the undertaking. The goals are reflected in the evaluation criteria and support the assessment of effects of the preferred undertaking.

1.4 Ontario Environmental Assessment Act

This project is subject to the Ontario EA Act and follows the Individual EA process identified in Part II of the Act. The EA Act requirements must be met in order to implement the preferred undertaking. An EA is a planning study that assesses potential environmental effects and benefits of an 'undertaking' (the intended project). The term 'environment' is broadly defined in the EA Act to include the natural environment, as well as, the social, cultural, built and economic aspects of the environment.

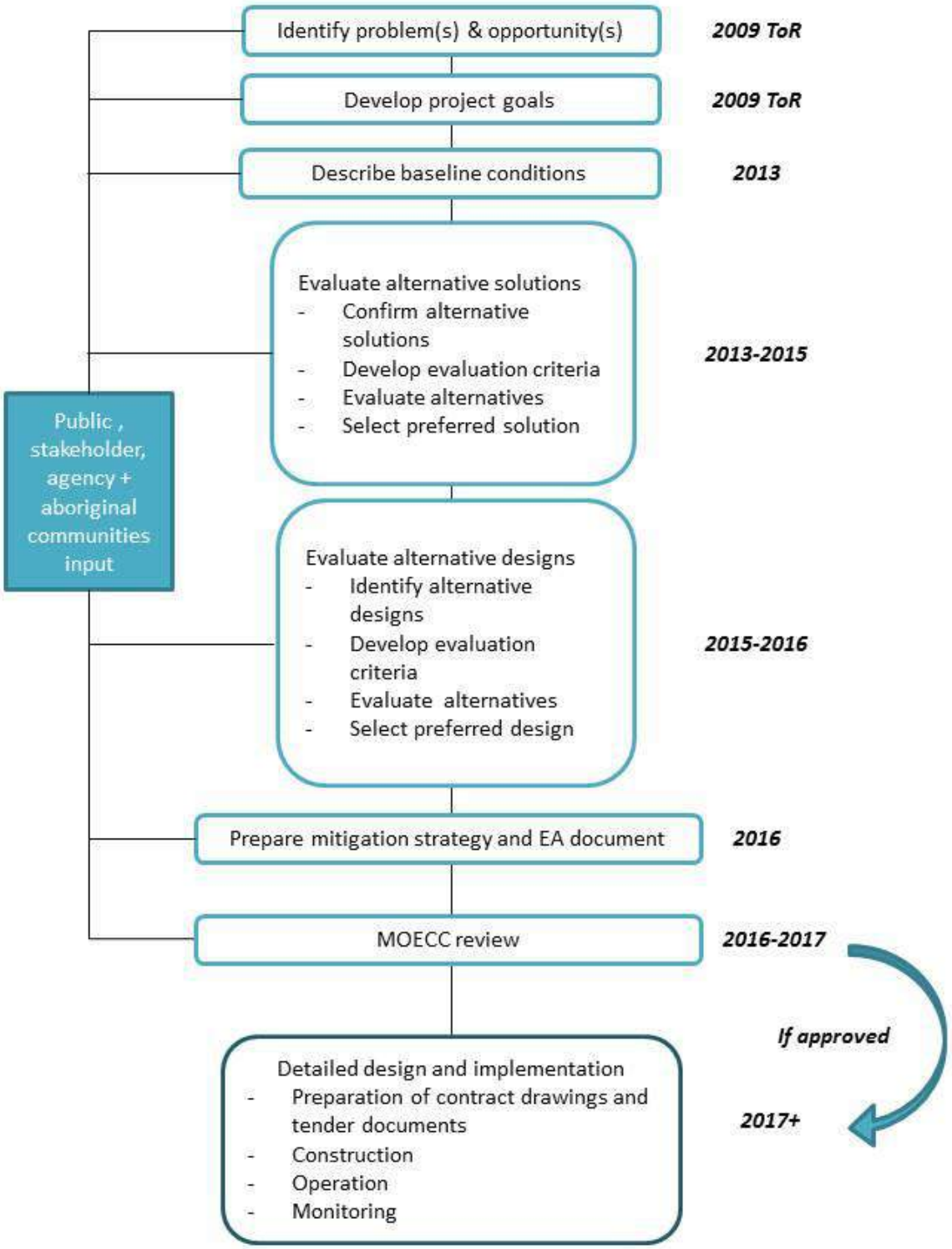
The project co-proponents have completed the EA study in accordance with all of the requirements of subsections 6(2)(a) and 6.1(2) of the Act including the following:

- *A description of the purpose of the undertaking;*
- *A description and statement of the rationale for the proposed undertaking, alternatives to the undertaking, and alternative methods for carrying out the undertaking; and,*
- *A description of:*
    - *the environment that will be affected or that might reasonably be expected to be affected, directly or indirectly, by the undertaking, the alternatives to the undertaking, and the alternative methods of carrying out the undertaking;*
    - *the effects that will be caused or that might reasonably be expected to be caused to the environment, by the undertaking, the alternatives to the undertaking, and the alternative methods of carrying out the undertaking;*
    - *the actions necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment, by the undertaking, the alternatives to the undertaking, and the alternative methods of carrying out the undertaking;*

- *An evaluation of the advantages and disadvantages to the environment of the undertaking, the alternatives to the undertaking and the alternative methods of carrying out the undertaking; and,*
- *A description of the consultation undertaken by the proponent and the results of the consultation.*

The Individual EA process follows two primary stages: the ToR stage which sets the framework for the EA, and the EA stage, which must be completed in accordance with the ToR as approved by the MOECC. **Figure 1.1** provides an overview of the Individual EA process that was followed and the timing of the major steps.

Figure 1.1: Individual EA Process Flowchart



During the ToR stage of the study, a series of commitments were identified and documented in the ToR that established what the EA needed to consider. The commitments were based on the requirements of the EA Act as well as input from the public, stakeholders and agencies received during ToR consultation activities. The EA Report is required to address these commitments prior to submission to the MOECC. **Table 1.1** identifies the commitments defined in the ToR and where they have been addressed in the EA Report.

Table 1.1: EA Terms of Reference Commitments

Commitment	Section Reference from the ToR	Corresponding Section of EA Report
Consideration will be given to potential opportunities to improve connections across the rail corridor to complement the recommended 'undertaking'.	Section 4.1	Section 3.2
The EA study will coordinate and seek opportunities of mutual benefit with existing planning initiatives and conclusions.	Section 4.2	Section 3.3
Reconfiguration of the Gardiner Expressway will need to include welcoming and accessible routes to the waterfront.	Section 4.2	Sections 4.2, 4.3
Any new configuration of the Gardiner Expressway will need to maintain an effective local and regional transportation system.	Section 4.2	Sections 4.2, 4.3
Reconfiguration alternatives will address the through-traffic function of the Gardiner Expressway and Lake Shore Boulevard.	Section 4.2	Sections 4.2, 4.3
The lands that extend from Dundas Street to Lake Ontario and from Spadina Avenue to Woodbine Avenue will be subject to a detailed level transportation assessment.	Section 5	Sections 3.2.4, 3.2.5, 4.3, 4.4
Transportation initiatives and traffic behaviours and modal splits at a city-wide or regional level will be considered in the transportation assessment.	Section 5.1	Sections 4.2, 4.3
A description of the existing and future environment (baseline conditions) in the study areas will be completed as part of the EA.	Section 5.1	Section 3
With the exception of transportation considerations, baseline conditions will be described for the Urban Design and Environmental Effects Study Area.	Section 5.2	Section 3

Commitment	Section Reference from the ToR	Corresponding Section of EA Report
Transportation conditions will be described for the larger Transportation System Study Area.	Section 5.2	Section 3
Potential environmental effects, including to the social and natural environment, of the alternatives and the proposed 'undertaking' will be identified and examined as part of the EA.	Section 5.3	Section 4 Section 5 Section 6
Both alternative solutions and alternative designs will be developed and evaluated in the EA study.	Section 6	Section 4 Section 5
The alternative solutions will be subject to evaluation and a preferred solution will be carried forward.	Section 6	Section 4
The alternative solutions and designs to be considered in the EA will be limited to "land based" travel modes and to those physically located within the study area. They will be developed to accommodate a transportation planning horizon year of 2031.	Section 6	Section 4 Section 5
The alternative solutions will include a description of the Gardiner Expressway and Lake Shore Boulevard reconfigurations to address both the previously outlined problems and opportunities.	Section 6.1	Section 4
Master plan land development layouts will be created for each alternative solution. The layouts will address how the surrounding areas react and respond to the proposed road configurations.	Section 6.1	Section 5
Infrastructure will be defined in sufficient detail to, for example, locate and position the new road elements and address conflicts with existing and proposed facilities.	Section 6.1	Section 3 Section 4 Section 5
Opportunities to encourage/improve other modes of transportation and manage changing traffic patterns will be considered.	Section 6.1	Section 4 Section 5
Opportunities to improve the local environment through reduction in ongoing effects (e.g., stormwater quality), flood protection, and naturalization initiatives will be considered.	Section 6.1	Section 4 Section 5 Section 6
The development of the alternative designs will be guided by the project goals and be developed to a higher level of detail than the alternative solutions.	Section 6.2	Section 5

Commitment	Section Reference from the ToR	Corresponding Section of EA Report
The alternative designs will include the reconfiguration of the Gardiner Expressway and Lake Shore Boulevard and be complemented with urban design/public realm designs and transportation solutions.	Section 6.2	Section 6
The alternatives will be evaluated in terms of their ability to address transportation considerations and city building opportunities along with environmental and economic considerations.	Section 7.1	Section 4 Section 5 Section 6
The decision-making process in the EA will consider opportunities for creating a new urban form and the creation of new public realm space along with transportation and infrastructure solutions and environmental and economic considerations.	Section 7.2	Section 4 Section 5 Section 6
The assessment and evaluation of the alternatives (solutions and designs) will be based on a set of evaluation criteria that represent the broad definition of the environment and consider both qualitative and quantitative (i.e., numerical) data.	Section 7.3	Section 4 Section 5
The potential effects of the alternatives (solutions and designs) will be identified. Both short-term construction effects and long-term operations effects will be considered.	Section 7.3	Section 4 Section 5 Section 6
Qualitative and quantitative data collected will be presented in a manner to allow the differences among the alternatives to be easily compared.	Section 7.3	Section 4 Section 5 Section 6
The project team will evaluate and determine the relative order of preference of the alternatives for each individual criterion/criteria group.	Section 7.3	Section 4 Section 5
For the preferred alternative, mitigation measures to reduce the effects and the residual or “net” effects of the undertaking will be described.	Section 7.3	Section 6
The transportation criteria group will address transit, pedestrian, cycling and automobile travel requirements and opportunities through the area. It will consider both local and through traffic needs.	Section 7.3	Section 3
Waterfront Toronto and the City will prepare a comprehensive list of commitments during the EA process.	Section 8	Section 6

Commitment	Section Reference from the ToR	Corresponding Section of EA Report
A monitoring plan will be developed during the EA process. The plan will consider all relevant phases of the proposed 'undertaking' including planning, detailed design, tendering, construction and operation. The plan will include compliance monitoring and effects monitoring.	Section 8	Section 6
Consultation will be undertaken in accordance with the Ontario EA Act.	Section 9.2	Section 7
The consultation program will engage the widest possible audience by offering multiple consultation opportunities and mechanisms for participation.	Section 9.2	Section 7
The program will offer early and ongoing opportunities for participation, well before decisions are made.	Section 9.2	Section 7
Opportunities for participation will be widely communicated through multiple communications channels.	Section 9.2	Section 7
The consultation program will provide opportunities for a diversity of perspectives and opinions to be raised and considered.	Section 9.2	Section 7
The consultation program will be adapted as required to meet the needs of consultation participants, Waterfront Toronto, the City of Toronto and the project team.	Section 9.2	Section 7
The impact of the consultation program and participant input on decision making will be clearly demonstrated.	Section 9.2	Section 7
With input from Aboriginal communities, consultation activities will be tailored to meet the particular needs of specific Aboriginal communities as these needs are communicated by the Aboriginal communities themselves.	Section 9.2.2	Section 7
At a minimum, each of the identified Aboriginal communities that may have an interest in the project will be contacted at the outset of the study to determine their interest in participating.	Section 9.2.2	Section 7
Individual meetings will be offered to each Aboriginal community.	Section 9.2.2	Section 7
Interested Aboriginal communities will be contacted and asked for feedback around each round of Public Forums.	Section 9.2.2	Section 7

Commitment	Section Reference from the ToR	Corresponding Section of EA Report
The consultation website (www.gardinereast.ca) established in the ToR phase will continue throughout the EA.	Section 9.2.2	Section 7
E-consultations will mirror the face-to-face consultations at Public Forums.	Section 9.2.2	Section 7
The web-portal will include any final published background reports, individual study reports and public notices as they are developed.	Section 9.2.2	Section 7
Interactive workshops will be convened to seek input from stakeholder representatives on key issues and opportunities during the project.	Section 9.2.2	Section 7
The project team will attend meetings when invited by specific organizations, as appropriate.	Section 9.2.2	Section 7
A "one-window" customer service centre (hot line) will provide basic information about the project and a focal point for receiving questions/comments and providing responses.	Section 9.2.2	Section 7
A notice will be issued when the EA study has been completed, documentation has been submitted to Government review agencies, and is available for public review.	Section 9.2.2	Section 7 Section 8
Summary reports of public comments will be available for review and feedback after workshops, public forums and other consultation events. Public comments, and the responses given, will be documented in a database by the independent facilitation team.	Section 9.3	Section 7 Appendix B
Additional required approvals will depend on the final 'undertaking' that is proposed and will be detailed in the EA.	Section 11	Section 8
The EA study will include all municipal infrastructure within the project area that is required to support the undertaking.	Appendix B	Section 3

Commitment	Section Reference from the ToR	Corresponding Section of EA Report
The available ambient contaminant concentration data (from MOECC and/or EC) will be used in the assessment, in order to establish background levels. An ambient air monitoring program specific to this study will be undertaken, which will be extended to January 2010, in order to capture seasonal variability in ambient concentrations of relevant contaminants.	Appendix B	Section 3 Section 4
Once the EA process is initiated (after ToR approval), detailed descriptions of the draft evaluation criteria will be developed and made available for the public and agencies to comment on.	Appendix B	Section 4 Section 5
The potential for impact on archaeological resources will be assessed as part of the EA study.	Appendix B	Section 3 Section 4 Section 5

1.5 Other Approvals

Additional agency approvals may be required for the project following an approval to proceed by the Minister of the Environment and Climate Change. These additional approvals would be identified and obtained during the detailed design phase of the project. The detailed design phase of work would include the preparation of more detailed engineering and landscaping plans (contract drawings) to confirm the construction of the preferred undertaking and feed into tender documents required for construction. **Table 1.2** presents a non-comprehensive list of other potential approvals required for the project that would be obtained during the detailed design phase.

Table 1.2: Other Provincial Approvals Required

Level of Government	Department/Ministry/ Municipality	Potential Authorizations/ Approvals
Provincial	MOECC	● Permit to Take Water (PTTW) under the Ontario Water Resources Act (TBC)
Municipal	Toronto and Region Conservation Authority (TRCA)	● Regulation of Development ● O. Reg. 166/06 Interference with Wetlands and Alterations to Shorelines and Watercourses Regulations
	Aquatic Habitat Toronto	● Project Review
	City of Toronto	● Road Occupancy Permit ● Road Cut Permit ● Tree Removal Permits ● Permit for Installation/ Relocation of Public Utilities ● Local Hydro Utility Building Permit ● Toronto Sewer Use Bylaw ● Noise By-law exemption

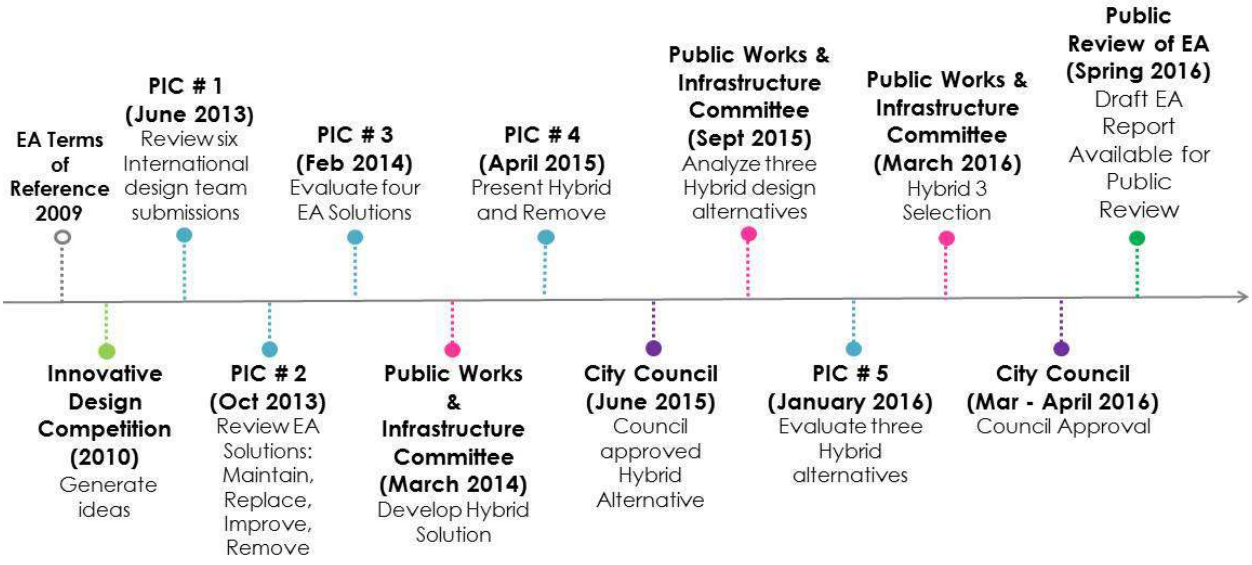
1.6 Consultation Process Overview

The involvement of community residents, stakeholders and those who may be potentially affected by a project is an integral part of the EA process. Consultation forms a key component of this EA study in keeping all stakeholders, agencies and the public informed and involved. The project co-proponents recognize the importance of engaging stakeholders and the public to provide multiple and ongoing opportunities for feedback throughout the EA.

The key consultation milestones during the EA study, following the approved ToR, included five rounds of public consultation. In addition there were stakeholder workshops, local and provincial agency meetings, aboriginal consultation, and individual landowner meetings. All of this consultation was held between May 2013 and January 2016. **Figure 1.2** outlines the key

milestones and consultation dates during the study process. Well over 7,000 individuals (26,958 individuals including website visits) were engaged during this process.

Figure 1.2: EA Study Timeline and Key Consultation Milestones



Throughout the EA study, the outcome of consultation events were summarized and made available for public review. A detailed log of questions and answers was stored in a database by LURA, the independent facilitation team. A detailed account of the content and results of project consultation is presented in **Chapter 7** of this report. The full Record of Consultation for the EA is provided in **Appendix B.**

Consultation for this EA was based on the following principles and objectives:

Guiding Principles

- *Inclusiveness* – the consultation program will engage the widest possible audience by offering multiple consultation opportunities and mechanisms for participation.
- *Timeliness* – The program will offer early and ongoing opportunities for participation, well before decisions are made.
- *Transparency* – Opportunities for participation will be widely communicated through multiple communications channels.

- *Balance* – The program will provide opportunities for a diversity of perspectives and opinions to be raised and considered.
- *Flexibility* – The program will be adapted as required to meet the needs of consultation participants, Waterfront Toronto, the City of Toronto, and the Project Team.
- *Traceability* – The impact of the consultation program and participant input on decision-making will be clearly demonstrated.

Objectives

1. To generate broad awareness of the project and opportunities for participation throughout the EA process.
2. To facilitate constructive input from consultation participants at key points in the EA process, well before decisions are made.
3. To provide ongoing opportunities for feedback and input, and for issues and concerns to be raised, discussed, and resolved to the extent possible.
4. To document input received through the consultation process and to demonstrate the impact of consultation on decision-making.

The following provides a summary of the key consultation activities that were undertaken during the EA Study.

Agency Consultation – A Technical Advisory Committee (TAC) was established to provide input at key milestones during the EA process. It included representatives from various City of Toronto departments, Toronto Transit Commission (TTC), GO Transit/Metrolinx, and TRCA.

Aboriginal Consultation – Waterfront Toronto and the City are committed to Aboriginal community consultation. Consultation activities were tailored to meet the particular needs of specific Aboriginal communities as they were communicated and requested by the Aboriginal communities themselves. Each of the identified Aboriginal communities were contacted at the outset of the study to determine their interest in participating.

Public Consultation – Public Information Centres (PIC) provided an opportunity for the public to give feedback and comments on study components, results, and ideas as they developed over the course of the project. The format included: panel displays, presentations, and small table discussions/ feedback on key questions.

A web-based portal (www.gardinerconsultation.ca) was set-up to enable online consultation as the study progressed. This consultation website was established in the EA ToR phase and continued throughout the EA. The e-consultations mirrored the face-to-face consultations that

took place during PICs. The web-portal also included final published background reports, individual study reports, and public notices as they were developed.

A "One-window" point of contact for the project was established during the development of the ToR, with dedicated phone/fax/ email and a link to the web-portal. A "one-window" customer service centre (hot-line) provided basic information about the project and was a focal point for receiving questions/comments and providing responses.

Stakeholder Consultation – A Stakeholder Advisory Committee (SAC) was established to provide an ongoing forum for feedback, guidance and advice to the Project Team at ten points during the EA process. The SAC also provided valuable feedback on materials to be presented to the public. The SAC was made up of approximately 40 key interest groups and community associations including, but not limited to, local businesses, residents groups, property owners, and special interest groups (e.g., environmental organizations, cycling and walking advocates, goods movement / shipping industry advocates, etc.). Further information regarding SAC membership is provided in **Appendix B, Record of Consultation**.

City Council and Committees Consultation – At key points in the study process, presentations were made to City Councillors through Public Works and Infrastructure Committee meetings and City Council meetings. Feedback was received at these meetings and incorporated into the EA study.

1.7 Structure of this Report

This EA Report has been structured to provide the reader with a step-by-step overview of the EA study as it was completed. The following is covered in this EA Report:

- Purpose of the Undertaking;
- Existing and Future Conditions;
- Description and Evaluation of Alternative Solutions;
- Description and Evaluation of Alternative Designs;
- Preferred Undertaking Effects Assessment and Mitigation;
- Record of Consultation; and,
- Concluding Statements and Next Steps.

The appendices included in this report include supplementary reports and documentation, and a complete record of consultation for the EA.

2.0 Purpose of the Undertaking

The purpose of the 'undertaking' is to address current problems and opportunities in the Gardiner East EA study area. The following sections present the key problems and opportunities that were considered in the EA study. Key problems include a deteriorated Gardiner Expressway that needs major repairs and a disconnected waterfront. Key opportunities include revitalizing the waterfront through city building, creating new urban form and character and new public realm space.

2.1 Problems and Opportunities

2.1.1 Key Problems

The key problems can be broken into two main categories: the deteriorated structure and the disconnected waterfront.

Deteriorated Structure

The Gardiner Expressway East, from Lower Jarvis Street to east of the DVP is an elevated roadway, comprising simple spans supported on steel or concrete bents. The City (and former Metro Toronto) has been repairing the structure since the 1980s. Except for the two connecting ramps from the DVP to the Gardiner, structure rehabilitation was mainly restricted to local patching including the deck and the bridge barriers. This section of the elevated Gardiner Expressway east of Jarvis Street was one of the first few sections rehabilitated in the 1980s and a new round of repairs and structural rehabilitation are again required.

Bent repairs required.

In 2012 the City approved a rehabilitation program for the entire Gardiner Expressway, including the elevated section from Strachan Avenue to the Don Roadway, in order to keep the expressway in a safe and operable condition. This program included rehabilitation of the section of the Gardiner under study in this EA, from Jarvis Street to the Don Roadway. The rehabilitation program was revised in 2013 to allow the Gardiner East EA to be completed. While the EA is underway, interim repairs are being completed between Jarvis Street and the Don Roadway in order to keep the structure safe and operable.

A final decision on the Gardiner East EA is imperative. The elevated Gardiner structure was constructed in sections between 1955 and 1966. The deck and concrete barriers east of Jarvis Street are in poor condition and are considered to be at the end of their service life. The effects of weathering, winter salting, and the loads imposed daily by an estimated 110,000 vehicles, particularly on the steel-reinforced concrete elevated section, have taken their toll on the structure.

Recognizing that implementation of the preferred EA alternative design would not likely commence until 2020, Toronto City Council has authorized $14 million of interim repairs to make this eastern portion of the structure safe and extend its service life to 2020. These repairs consisted of: temporary timber bracing under the deck; localized concrete deck repairs; and repair and replacement of severely deteriorated parapet walls.

Even with City Council's endorsement of Hybrid 3 confirmed, lengthy timelines are required to: complete the Environmental Assessment process, including approval from the Ontario Minister of the Environment and Climate Change; undertake detailed design; prepare construction tender documents; and procure the necessary construction contractor(s).

After decades of uncertainty and numerous costly studies on the future of the Gardiner/Lake Shore corridor, agreement and decisive action are needed with respect to the eastern segment of the expressway, which has considerable potential for redevelopment and positive change.

Disconnected Waterfront

The elevated structure is a barrier.

The Gardiner Expressway and Lake Shore Boulevard in combination with the rail line viaduct create a barrier between the city and the waterfront/lake. While the rail line serves as a physical barrier (access is limited to a few narrow street openings), the Gardiner Expressway and Lake Shore Boulevard also act as a psychological barrier with “dead space” located underneath it. Lake Shore Boulevard can only be crossed at a few north-south streets (the same streets that provide access under the rail line) and is designed as a highway collector, not a city street. The Gardiner Expressway, with its ramps and elevated structure,

restricts views and creates a gap in the urban fabric between the city and the waterfront and between existing and planned communities. This project addresses this gap.

Along with the challenges associated with this project, the study team identified several opportunities which were synthesized into five main project goals as previously presented.

2.1.2 Opportunities

Revitalize the Waterfront

Reconfiguring the Gardiner Expressway and Lake Shore Boulevard presents opportunities to help re-shape the character of the urban environment, to create new connections between existing city neighbourhoods and new waterfront districts, and to make long-term quality infrastructure investments. What is now in need of repair and viewed as an obstacle between the city and its waterfront can become both a connector and place in its own right. This is an opportunity for city-building: the inherent strength of cities lies in their ability to create and facilitate connections. Connections are more than just high quality roadways and pedestrian routes between desired centres; they include visual corridors and markers, continuous active uses, vibrant civic and commercial destinations and spaces that foster communication and interactions.

Create a Sustainable Waterfront

Such large scale and long-term projects are an opportunity to apply sustainable practices at the social, economic and natural environment levels. The modified Gardiner Expressway/Lake Shore Boulevard, and the surrounding development it catalyzes, can be guided and evaluated by sustainable practices.

While environment conditions in the study area are degraded, there are a number of projects taking place within the waterfront area which will finally achieve the vision that the City of Toronto has for this area - green, healthy and energy efficient. Waterfront Toronto and TRCA have taken the lead in integrating many habitat improvement projects along the waterfront. Among these is the *Don Mouth Naturalization and Port Lands Flood Protection project*. This project provides a unique opportunity to support and build on these plans to create natural habitats around the study area.

Generate and Capture Economic Value

The project presents opportunities for positive net value creation in a local, regional, and global context. These may manifest through public and private investments that create value for the public sector and the community, in terms of streets, open space, and catalysts for private development, and can achieve regional competitiveness and global brand equity for Toronto. The combined value can globally position Toronto to attract investment capital, talent, and tourism.

Port Lands Acceleration Initiative, rendering of Don Roadway, view south

Rebalance Transportation Modes

This project also creates an opportunity through the reconfiguration of transportation infrastructure to allow for a rebalancing of transportation modes from an automotive focus to one that has high reliance on pedestrian, cycling, and transit (local and regional) modes. In the coming decades it is expected that there will be decreased dependence on the private automobile and an increase in the use of active public modes and transit. The proposed 'undertaking' can assist in achieving balanced transportation opportunities.

2.2 Study Areas

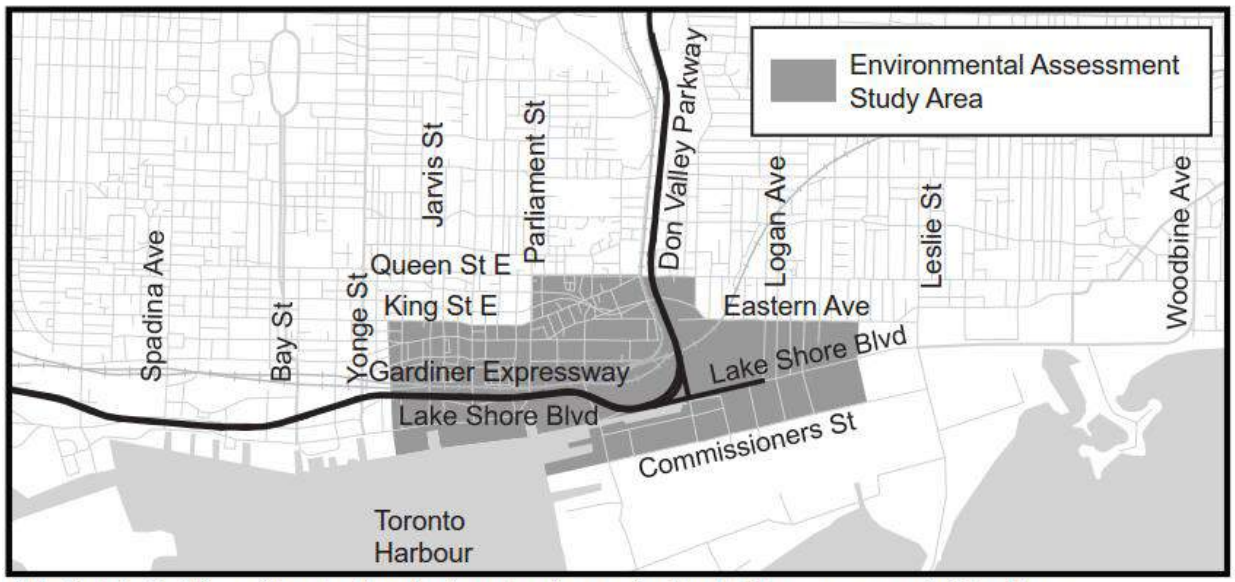
The section of the Gardiner Expressway and Lake Shore Boulevard that is being examined for reconfiguration extends 2.4 km from approximately Lower Jarvis Street to just east of the DVP at Logan Avenue. Two study areas have been initially developed:

1. **Urban Design and Environmental Effects Study Area** – includes the lands in the vicinity of the section of the Gardiner Expressway and Lake Shore Boulevard that is being considered for reconfiguration. These are the areas that could potentially experience disruption effects and be transformed through redevelopment opportunities. This is expected to include lands south of King Street to the waterfront, and from Lower Jarvis Street to approximately Leslie Street. This study area includes the precincts of East Bayfront, West Don Lands, and Keating Channel, as well as portions of the Port Lands and South of Eastern areas.
2. **Transportation System Study Area** – includes the area that could be affected by changes in traffic patterns and volumes. The lands that extend from Dundas Street to Lake Ontario and from Spadina Avenue to Woodbine Avenue will be subject to a detailed level transportation assessment. The study area includes the transportation network of transit (subway, streetcar, and GO Transit service), and vehicular traffic including goods movement and emergency vehicles, and the pedestrian and cycling networks. Further, transportation initiatives, traffic behaviours and modal splits at a city-wide or regional level will also be considered in the transportation assessment.

The study area includes five emerging waterfront neighbourhoods: Lower Yonge, East Bayfront, Keating Channel Precinct, Port Lands and South of Eastern. The former Unilever Soap complex is also proposed as a significant new neighbourhood. North of the rail viaduct the study area also includes West Don Lands, Distillery District, Cork Town, Riverside, Leslieville, and the St. Lawrence neighbourhoods. Regional investigation of transportation and economics requires a wider study area. The lands that extend from Dundas Street to Lake Ontario and from Spadina Avenue to Woodbine Avenue have been included in the transportation assessment for the EA.

Figure 2.1 illustrates the study area.

Figure 2.1: Study Area



Note: Certain disciplines will conduct investigations at a city or regional level. These areas are not defined here.

2.3 Temporal Boundaries

In completing the EA, both existing conditions (2013) and expected future conditions (2031) in the study area were considered. A 2031 full build-out date has been used for this study to assess the effects of the alternatives on the full development plans for the area, whether they are achieved by 2031 or at a later date. The potential construction impacts of the alternatives have been assessed on the basis of existing (2013) conditions although consideration was also given to developments expected in the short-term in the Study Area as per City approved precinct plans. For the purposes of the EA, it was assumed that project construction would occur over a six-year period commencing in 2020.

2.4 Coordination with Other Studies

There are many other EAs, plans and studies that have been completed or are in the process of being completed in the study area. These include initiatives by several different agencies and private landowners. To the extent possible, these studies were considered in the completion of the EA study. **Table 2.1** provides a summary of the most relevant current studies and describes how they were considered in the Gardiner East EA.

Table 2.1: Key Plans and Studies Considered in the EA

Plan/Study Name	Summary	Consideration for the EA
Lower Yonge Transportation Master Plan EA/Phase 3-4 Class EA	The Lower Yonge Precinct is bounded by Yonge Street to the west, Lower Jarvis Street to the east, Lake Shore Boulevard East to the north, and Queens Quay to the south. The TMP articulates a long-term vision and physical plans for the Precinct. The preferred alternative for the Lower Yonge TMP includes a more fine-grained local street network for the Precinct was created by extending the existing Harbour Street from Yonge Street to Lower Jarvis Street, adding a new local street east of Cooper Street, connecting Lake Shore Boulevard East to Queens Quay East, and providing a more permeable street grid for pedestrians, vehicles and cyclists. It also includes the relocation of the Jarvis west-bound off ramp. A Phase 3-4 Class EA has been initiated to confirm the preferred design for these road changes.	The new road network, including changes to the Gardiner ramps proposed in the Master Plan, was considered in the transportation modelling work for the Hybrid alternative.
Lower Don Lands Master Plan EA and Villiers Island Precinct Plan	The LDL MP EA, which was led by Waterfront Toronto in cooperation with TRCA and the City, refines the location of road alignments and includes all of the critical infrastructure elements identified in the City of Toronto's Central Waterfront Secondary Plan. Recognizing that the site is a critical link between city and harbour, the LDL MP EA provides multiple connections to the surrounding neighbourhoods, existing and proposed, and to the harbour on all sides. The road and transit network has been shaped to frame the new (proposed) Don River alignment based on the standards for all the bridges set out in the Don Mouth Naturalization and Flood Protection EA	Defines the revised local street network and established preliminary population and employment targets that were considered in the development of the alternatives and the transportation modelling.

Plan/Study Name	Summary	Consideration for the EA
	(DMNP EA). The LDL MP EA and the DMNP EA work in concert to transform the existing river mouth and western port area into the centrepiece of a series of new mixed-use waterfront communities, while delivering a healthier, more natural river outlet to the Toronto Inner Harbour and Lake Ontario. The LDL MP EA includes the realignment of Queen's Quay East, Lake Shore Boulevard East, and Cherry Street, and the location for bridges at the Keating Channel, Commissioners Street Bridge and Basin Street bridges over the Greenway. The first phase of detailed planning for development stemming from the LDL MP is the Villiers Island Precinct Plan. The objectives of this Precinct Plan were considered in this EA. Details of the plan were not known at the time of the Gardiner East EA documentation; however, consideration for the growth and development being studied in the area has been made.	
Don Mouth Naturalization and Flood Protection Project EA	TRCA, in cooperation with Waterfront Toronto and the City, completed an Individual EA for the naturalization of the mouth of the Don River and larger Port Lands flood protection referred to as the DMNP EA. The study addressed lands encompassing approximately 290 hectares of urban land east and south of the Don River that was subject to risk of flooding including lands within the Study Area for the TSMP EA. The DMNP EA will transform the existing mouth of the Don River including the Keating Channel, into a healthier, more naturalized river outlet to Lake Ontario, while also removing the risk	Influenced the design of the alternatives in regards to Don River crossing locations for both the elevated expressway and for Lake Shore Boulevard.

Plan/Study Name	Summary	Consideration for the EA
	of flooding to 240 hectares of urban land to the east and south of the existing river. This includes providing flood protection for lands within the Gardiner EA study area. This project is a key component of Waterfront Toronto and the City's plans to renew and revitalize Toronto's waterfront, without it the Port Lands cannot be redeveloped because it is located within the Don River floodplain. The DMNP EA was approved by the MOECC in January 2015. The conceptual design for the DMNP includes a new river valley system developed through a combination of cut and fill and an associated low-flow river channel that flows south and then west into the Inner Harbour, with an approximate location halfway between the Ship Channel and the Keating Channel. Waterfront Toronto, in coordination with TRCA and the City, is leading the next steps for implementation of this project in tandem with the Lower Don Lands and Villiers Island Precinct plans.	
Port Lands and South of Eastern Transportation and Servicing Master Plan (TSMP) EA	This TSMP EA has been undertaken as a coordinated infrastructure planning project that meets the requirements of both the Municipal Class EA, 2000 (amended 2007) (Class EA) process and the Planning Act, R.S.O. 1990 (Planning Act). The goal of the TSMP EA is to provide solutions in the Study Area with respect to the provision of sustainable transportation, employment, the environment, climate change and housing. The proponents of the EA include the City of Toronto, Waterfront Toronto and TRCA.	While this study is being undertaken in parallel with the Gardiner EA, the vision being proposed for Port Lands and South of Eastern has been reviewed as the project has unfolded. In particular, proposed changes to the road network and projections for population and employment have been considered including the planned Broadview extension realignment.

Plan/Study Name	Summary	Consideration for the EA
Metrolinx Expansion Plans/ Projects	Metrolinx has several projects underway that could have an effect on their use of land in the study area. Projects include the Regional Express Rail that will result in the need for a fourth track over the Don River rail bridge, possible train storage yard expansion and possible new GO Station west and/or east of the Don River.	Metrolinx was consulted on several occasions during the course of the EA. The alternatives were developed to avoid direct impact on Metrolinx rail property. It is expected that during detailed design some revisions to the preferred alternative may be required to accommodate rail facility expansion plans in the area.
First Gulf Development – Official Plan Amendment (OPA)	First Gulf is proposing a significant commercial/retail development on the former Unilever site located on the north-east corner of Lake Shore Boulevard and Don Roadway. This proposed project is of significant size (the developer has proposed up to 50,000 employees) and would serve as a major economic catalyst for the Port Lands, South of Eastern employment area and the larger City. In October 2015, First Gulf initiated an OPA application to commence a policy review and to begin comprehensive planning of the Unilever site and adjacent lands. The proposed OPA is a policy initiative, not a development proposal. No conceptual plans for development were submitted as part of the application. The application is currently under review by the City.	The Gardiner EA study team has met with the First Gulf team on several occasions throughout the course of the EA study. The development and evaluation of the alternatives considered the First Gulf development proposal.

3.0 Description of Potentially Affected Environment

This EA study followed a planning approach whereby environmental constraints and opportunities were considered within the context of the environment as broadly defined under the EA Act (i.e., the natural environment as well as the social, economic and cultural heritage and other "environments" relevant to the undertaking). The description of the potentially affected environment (otherwise known as the baseline conditions) was prepared based on this approach.

The methodology used to establish baseline conditions involved the establishment of study areas, baseline condition horizon years, and data collection. The study areas are described in **Section 2.2** and include 1) Urban Design and Environmental Effects Study Area, and 2) the Transportation Systems Study Area.

The baseline conditions document the natural, social, economic, urban design, infrastructure and transportation environments of the various precincts and neighbourhoods that exist in the study area. The core precincts and neighbourhoods that have the greatest potential to be affected by the undertaking due to proximity to the Gardiner Expressway and Lake Shore Boulevard East corridor include the St. Lawrence Neighbourhood, Distillery District, West Don Lands, Lower Yonge, East Bayfront, Keating Channel, Lower Don Lands and Villiers Island, Port Lands, and South Riverdale/Studio District. **Figure 3.1** illustrates the general location of these precincts.

Figure 3.1: Study Area Precincts and Neighbourhoods

To assess and evaluate the alternatives, two baseline condition horizon years were established: 1) 2013 representing existing or near term conditions and 2) 2031 representing the long term future operating condition. The 2013 condition was considered when assessing construction related effects (construction is expected to occur from about 2019-2025). By 2031, it was assumed that the undertaking would be fully operational and the surrounding vacant lands would be fully built out as per current City and Waterfront Toronto plans. The 2031 condition was assumed when considering operational effects. Where applicable, the existing 2013 and future 2031 baseline condition is described. Future 2031 conditions are subject to change and thus the analysis reflects the information for the study area that was known as of the date of this EA.

The observations described in this chapter were arrived at through a comprehensive data collection process. This process included developing an inventory of existing conditions based on secondary source information such as existing approved plans, studies, historic mapping, databases (municipal, provincial, or federal), and other data provided by the City and Waterfront Toronto. Primary source data was also collected through fieldwork, modelling, and consultation with landowners, the general public, other stakeholders and government agencies.

To describe the potentially affected environment in the study areas, this chapter is structured on the four study lenses: Environment, Infrastructure and Transportation, Urban Design and Economics. The Environment section summarizes the baseline conditions reports for cultural heritage and archaeological resources, natural environment, soils, groundwater, stormwater and air quality and noise. The Infrastructure and Transportation section examine roadways, railways, structures, servicing and utilities. Also addressed in this section is a description of the existing and future transportation demand. The Urban Design section describes urban design, land use, public realm, as well as population and employment (social environment) conditions. The final section of the chapter focuses on Economic baseline conditions which includes a description of business activity in the study area.

This chapter provides an overview of future and existing baseline conditions. The baseline conditions appendices provide much greater detail about the study area and act as a source of further information for those interested.

The information in this chapter informed the development of alternative solutions and alternative designs, was considered in the alternatives evaluation process, and was considered in the assessment of projects effects and development of mitigation.

3.1 Environment

This section provides a description of the environment that could be potentially affected by the undertaking including cultural heritage and archaeological resources, the natural environment (terrestrial and aquatic), soil and groundwater, stormwater management, and air quality and noise.

3.1.1 Cultural Heritage and Archaeological Resources

The Toronto waterfront is an area in which massive landscape changes have occurred as the city has developed. The Don River has played a critical role in the city's history beginning with First Nations in the 1600s, and expanded with Euro-Canadian industrial settlement that began along Toronto's waterfront in 1793. With growth and development of the civilian town, the waterfront grew as a commercial and industrial area. Approximately 60% of the study area is entirely comprised of made lands, formed between the mid-nineteenth and mid-twentieth centuries. Lake Shore Boulevard was created through successive waves of lakefill. When it was first built, it provided road access to waterfront areas during the first half of the twentieth century. This history is fundamental to the existing conditions in the study area which reflect the industrial era of development in Toronto.

Due to this long, dynamic history, the study area contains a number of archaeological and cultural heritage features. In terms of cultural heritage resources, 103 properties have been previously identified and/or designated as retaining cultural heritage value, within or in the immediate vicinity of the general study area. These features are shown in **Figure 3.2**.

To identify archaeological resources within the study area, a Stage 1 Archaeological Resource Assessment was undertaken. Through this process it was determined that eleven archaeological sites have been registered within the general study area. These sites are shown in **Figure 3.3**. Non-registered sites are also considered as part of the archaeological resource assessment but are not indicated on Figure 3.3 which identifies registered sites only. While distance from water is one of the most commonly used variables for predictive modelling of archaeological site location, historical development of the area has been such that there is no potential for the survival of associated archaeological resources in primary contexts.

In addition, the archaeological assessment considered the use and significance of land for Aboriginal communities. It should be noted that there is no apparent current use of the lands by Aboriginal communities for traditional purposes; however, the Gardiner East EA project team is aware that the Mississaugas of the New Credit First Nations (MNCFN) is currently contemplating a new claim related to water resources in the area. As of February 2016 this new

claim had not yet been submitted. The MNCFN do have an accepted Specific Claim which was approved and paid out in 2010 with the Federal Government. Consultation with the MNCFN by the Gardiner East EA project team is ongoing and considers the new claim under review.

Figure 3.2: Cultural Heritage Resources by Precinct and Neighbourhood

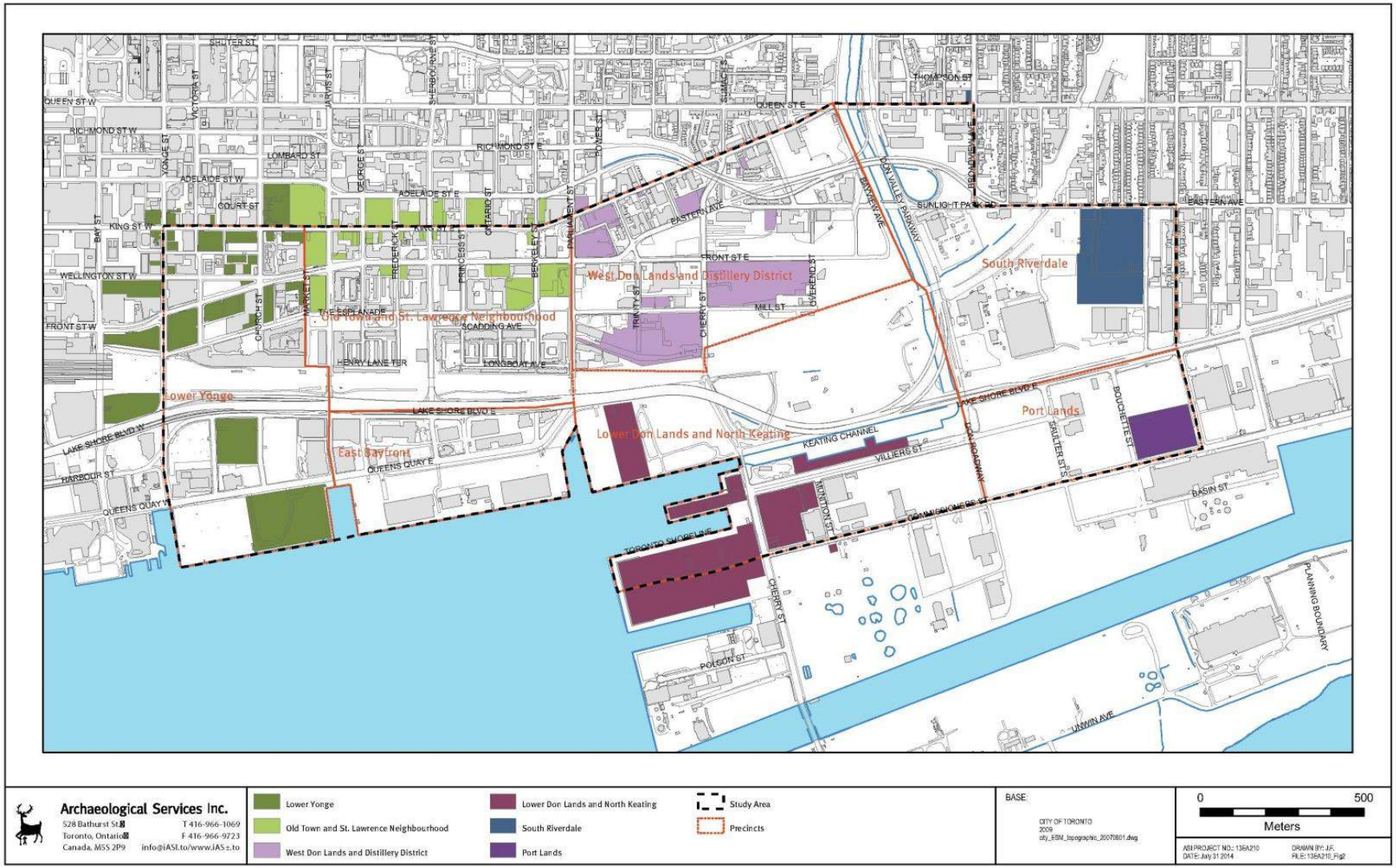
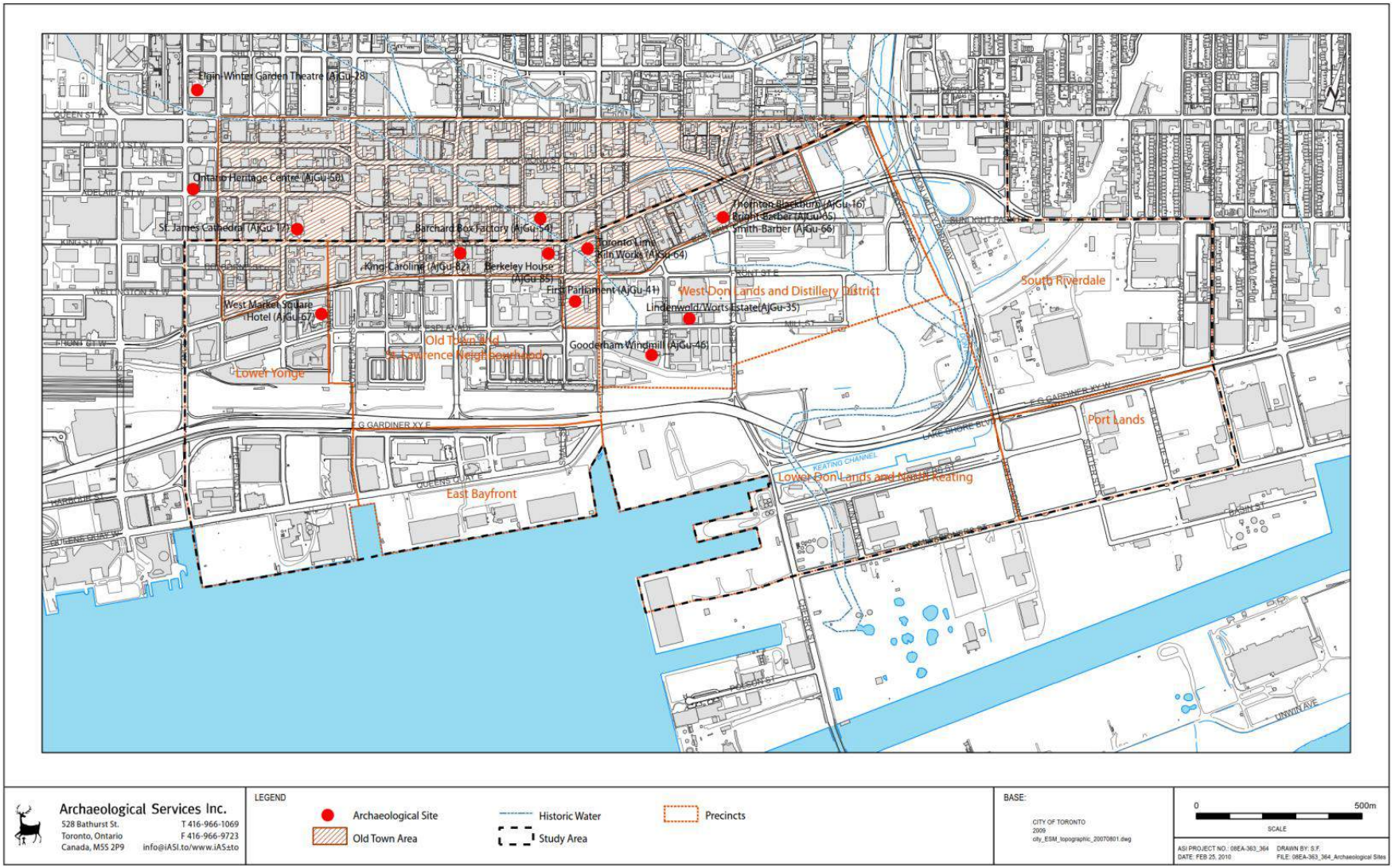


Figure 3.3: Registered Archaeological Sites



While the area is rich in history, the majority of the cultural heritage and archaeological resources do not overlap the Gardiner Expressway-Lake Shore Boulevard corridor that is under study in this EA. Of the resources identified, the three of note are Knapps' Roller Boat in East Bayfront, Polson's wharf (which served the Polson Iron Works) in East Bayfront, and the Victory Soya Mills Silos in the Keating Channel Precinct. Although these three resources are historical features in the study area, none of these resources are registered archaeological sites. Knapp's Roller Boat is a unique cylindrical ship that was launched in 1897. The ship was not a success and was substantially rebuilt on several occasions. Eventually the boat was abandoned to be buried by lakefill in the late 1920s. Research suggests that buried remains of Knapp's Roller Boat lie between Lake Shore Boulevard, the Gardiner Expressway, Richardson Street and Lower Sherbourne Street, north of the property currently known as 215 Lake Shore Boulevard East in East Bayfront. Recent redevelopment in East Bayfront has not identified these buried remains although the redevelopment to date has been south of Lake Shore Boulevard.

The City Corporation Yard Wharf (also known as Wharves 38 and 39) stood to the east of the Polson Iron Works with a principal purpose to carry street sweepings for dumping at the Toronto Islands. In 1906, the Polson's purchased this property to expand their shipbuilding facilities. The site was subsumed by lakefill between 1926 and 1928. The location of this resource was on the west side of Sherbourne Street and extends from Mill Street south through the Gardiner Expressway-Lake Shore Boulevard corridor into the northern edge of East Bayfront Precinct.

The Victory Soya Mills Silos are also a notable cultural heritage resource which sits on a historic commercial property located in the Lower Don Lands and Keating Channel Precinct (the property is identified in Figure 3.2 on the north side of Keating Channel, east of Parliament Street). The property has a northerly border of the Gardiner Expressway-Lake Shore Boulevard corridor and southerly border of the Keating Channel/Lake Ontario. This site is a notable feature identifying the history of industrial activity along Toronto's waterfront.

3.1.2 Natural Environment

This section provides an overview of the natural, terrestrial and aquatic environment in the study area.

The study area is within the larger ecoregion of the St. Lawrence Lowlands and Mixed Forest Plains of southern Ontario. **Figure 3.4** consists of Map 9 of the City of Toronto Official Plan that identifies the City's Natural Heritage System (City of Toronto, 2010). The study area is connected to the Don River Valley which is one of the city's most extensive natural features.

Within this regional context, the study area includes the mouth of the Don River at Lake Ontario.

Due to the heavy urbanization of the study area including industrial and port activities dating back to the 1800s, the natural environment has been severely degraded. There is little natural habitat and wildlife that is native to the study area. Naturalized environments in the study area primarily exist as regeneration on former industrial sites. Presently there are few terrestrial habitat opportunities in the area due to:

- the flat, open terrain of the area;
- lack of cover;
- lack of connecting corridors between habitat blocks; and,
- the impact of invasive species, chemical contamination and urban population.

The existing 2013 terrestrial natural environment baseline conditions are presented in **Figure 3.5**.

There are no Environmentally Significant Areas (ESA) in the study area.

Vegetation communities that do exist in the study area exist along colonized embankments (along the Don River and Lake Ontario waterfront), fill areas, rail corridors and newly regenerated industrial sites that include waterfront parks and open spaces. The existing diversity of plants and animals is low and there is limited hedgerow habitat that provides minor movement corridors for terrestrial species. Due to the lack of suitable wetland habitat in the study area, very few reptiles and amphibians are expected to exist within it.

Figure 3.4: City of Toronto Natural Heritage System

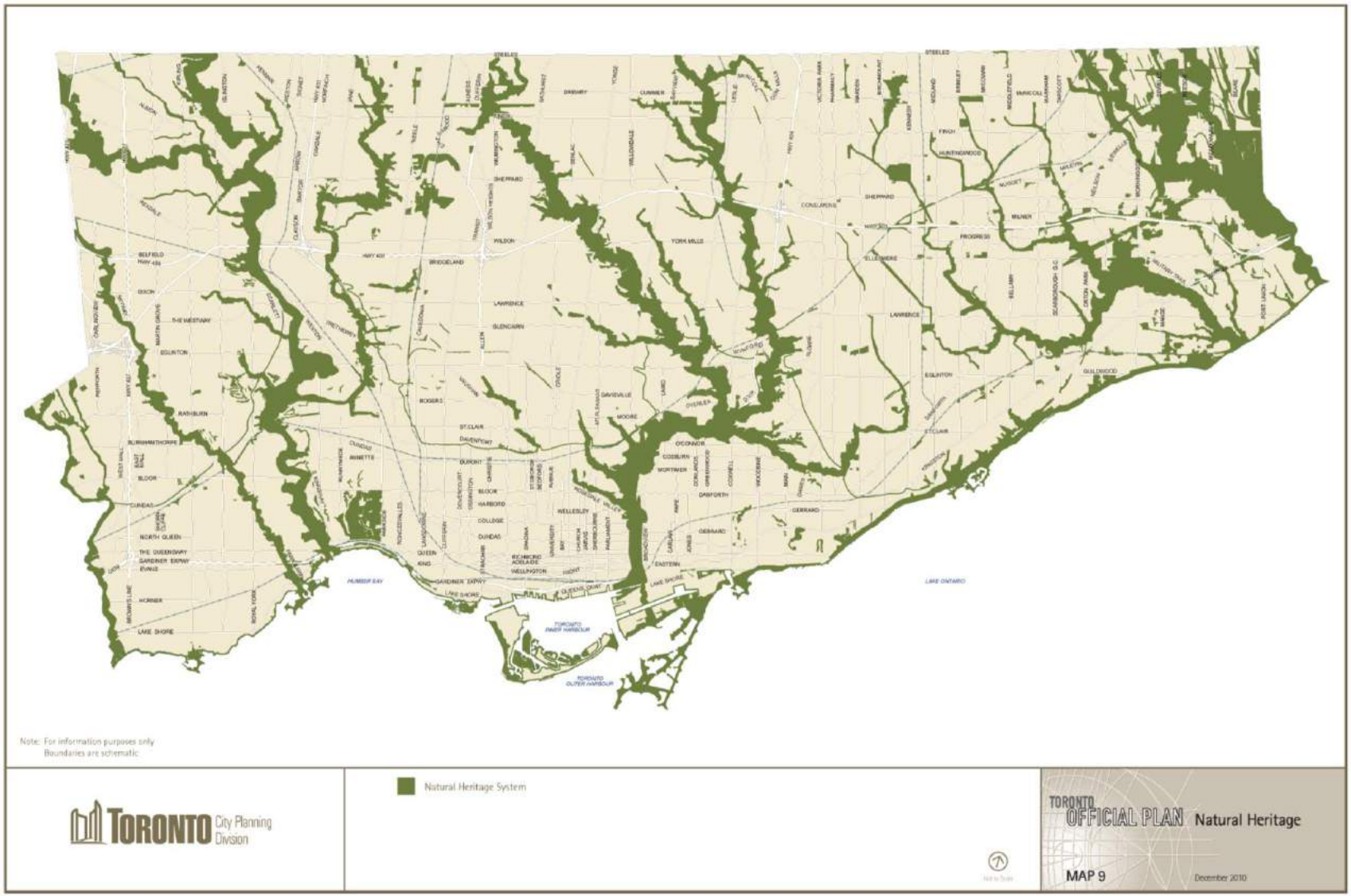
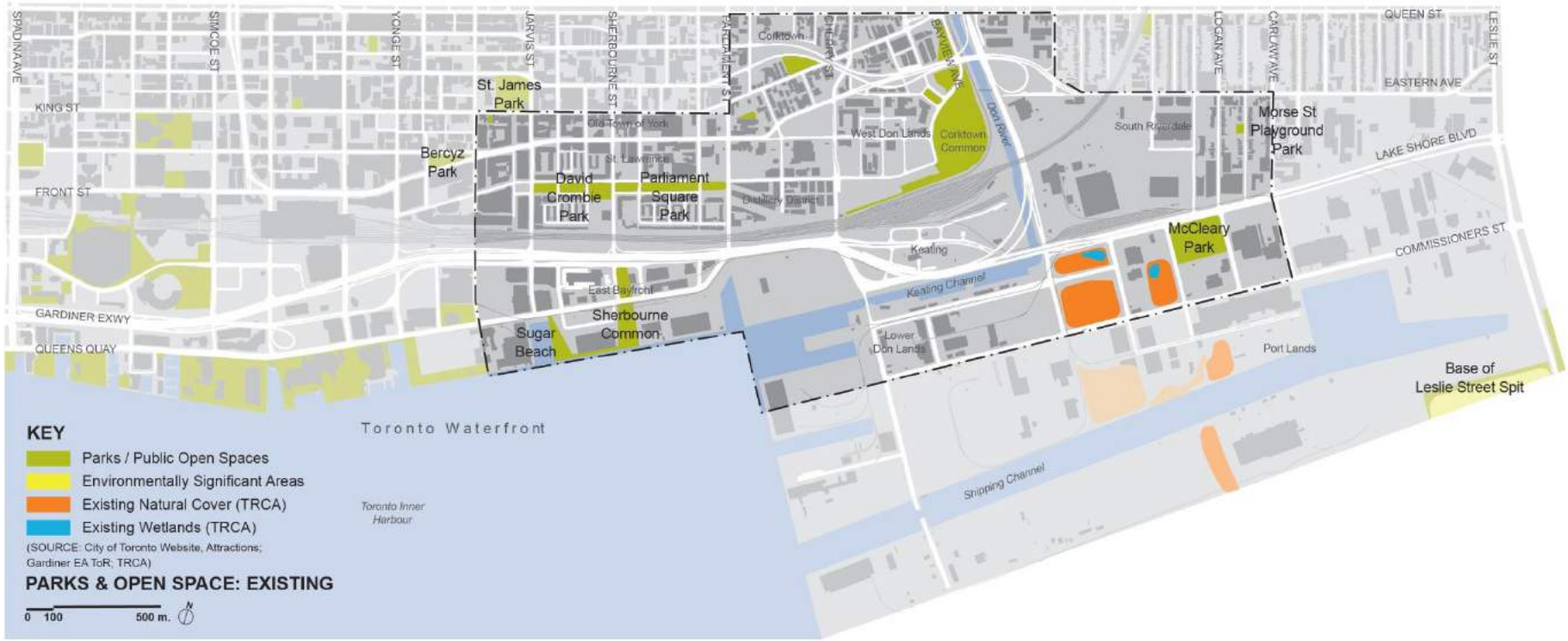


Figure 3.5: Natural Environment Existing Conditions (2013)



For the DMNP, the TRCA completed a biological inventory of the Lower Don Valley. The survey determined that most of the ecological communities suffer from severe disturbance or invasion by exotic species. Only one of the communities (open sand barren ecosite (SBO1)) is classified by TRCA as having any particular significance, and was located to the northeast of the Cherry Street and Lake Shore Boulevard. The area between the Keating Channel and the Ship Channel has a long history of industrial development; however some of the vacant parcels are being reclaimed by an array of non-native species. Cottonwood is common in this area; however, many of the trees are invasive alien species such as Manitoba Maple (*Acer negundo*), Black Locust (*Robinia pseudosacacia*) and Norway maple (*Acer platanoides*).

Terrestrial wildlife in the study area is primarily linked to the proximity of Tommy Thompson Park and the Leslie Street Spit as a significant feature supporting a high diversity of biological communities, including a significant population of migratory birds during the spring and fall migrations. Based on a review of TRCA reports, within the study area around the Keating Channel and Don River mouth, there were only four animal species observed as having significance in an urban context. **Table 3.1** lists the species observed.

Table 3.1: Regionally Significant Animal Species in the Study Area

Species	Common Name	Number of Locations	TRCA Rank
Stelgidopteryx ruficollis	Northern Rough-winged Swallow	1	L4-Urban Significance
Actitis macufaria	Spotted Sandpiper	1	L4-Urban Significance
Tyrannus tyrannus	Eastern Kingbird	1	L4-Urban Significance
Dumetella carolinensis	Grey Catbird	3	L4-Urban Significance

Source: TRCA, 2011

Aquatic features in the study area include the Lower Don River and the Keating Channel. Aquatic habitat in these water bodies are of low quality. Fish habitat features within the Lower Don River are generally characterized as degraded, highly disturbed conditions that are uniform in nature and lack habitat diversity and complexity. There is a general lack of in-stream cover in terms of bank structure, aquatic vegetation or suitable substrates such as gravel, cobble and boulders. The river is best characterized as lacustrine in nature with

hardened concrete channel banks and very little riparian cover. The productivity, water quality and overall health of an aquatic environment are generally depicted in the health of the benthic community. The most profound influence on the benthic community is suspended sediments and organic enrichment from storm sewer discharge and combined sewer outfalls (CSO). As such, the benthic community present within the Lower Don River exhibits a relatively low diversity. This condition has persisted since the late 1960s showing little change through to today.

Comprehensive fish sampling (electrofishing along three transects) conducted by TRCA from 1989 to 2012 revealed a total of 30 fish species inhabiting the Lower Don River and the Keating Channel between May and November. All of the fish captured were typically warmwater and coolwater species; however, Atlantic Salmon (*Salmo salar*), Chinook Salmon (*Oncorhynchus tshawytscha*), Rainbow Trout (*Oncorhynchus mykiss*) and Sea Lamprey (*Petromyzon marinus*), which are typically coldwater species, were also captured. The most common species captured during TRCA sampling of every year were White Sucker (*Catostomus commersoni*), Emerald Shiner (*Notropis atherinoides*) and Gizzard Shad (*Dorosoma cepedianum*). These three species accounted for 68 percent of the fish community in spring, summer and fall in 2012. Other high order piscivorous species such as Northern Pike (*Esox lucius*) and Walleye (*Sander vitreum*) were also captured during the survey period, albeit in low numbers, but indicate that trophic interactions between predator and prey within the degraded system may be occurring.

Through annual surveys, TRCA has found that the limiting aquatic habitat structure plays a key role in affecting the low numbers of fish and species diversity in the Lower Don River.

Dredging occurs frequently in the Keating Channel, which would have a negative impact on colonization of aquatic plants. The deep vertical concrete, wooden and steel sheet pile walls, the lack of riparian / instream vegetation or cover in the Keating Channel, and the regularity of dredging and the general uniform sandy substrates provide poor fish habitat conditions for most estuarine fish and wildlife species. Although there is little aquatic vegetation in the Keating Channel, there is adequate vegetation in the quays and slips of the Inner Harbour as well as the embayments of the Toronto Islands to provide habitat for the fish species found in both the Inner Harbour and Keating Channel.

Fish sampling conducted by TRCA from 1989 to 2012 revealed a total of 25 fish species inhabiting the Keating Channel between May and November. In any particular year, no more than 12 species were recovered with an average of only seven per year throughout the course of the sampling period. Many of the fish species captured were not considered typical warmwater species; rather they were generally cool and coldwater lake species such as alewife and emerald

shiner. The species assemblage and richness captured in the Keating Channel was lower in diversity than the Lower Don River. The most common species captured during TRCA sampling were alewife and emerald shiner in the spring / summer and gizzard shad in the fall. Similar to the Lower Don River, other high order piscivorous species such as Northern pike and Chinook salmon were also captured in the Keating Channel indicating that some trophic interactions between predator and prey within the degraded system may be occurring.

In recent years, there have been improvements to parks, public open space, waterfront and slips in the study area which contribute to improving terrestrial and aquatic habitat. These parks include Corktown Common in the West Don Lands which includes a flood protection landform along the western edge of the Don River, and the connected Sherbourne Common, Canada's Sugar Beach, and the Water's Edge Promenade within the East Bayfront precinct. These improvements have resulted in better connected natural features, improved tree cover, and improved aquatic habitat along the East Bayfront shoreline. These areas may develop into habitat for terrestrial and bird species especially considering the proximity to Tommy Thompson Park which is the largest existing natural habitat along the waterfront. The Lower Don River West Remedial Flood Protection Project was completed to provide flood protection for the West Don Lands and includes the flood protection landform on which Corktown Common sits. In addition, the DMNP EA has been approved and many of the aquatic habitat enhancement plans based on the EA will be in progress as the Gardiner East preferred design is completed. The timing of the DMNP habitat enhancement plans has not been confirmed, however, the planned improvements will greatly enrich the aquatic habitat in the Don River and Keating Channel from what exists currently.

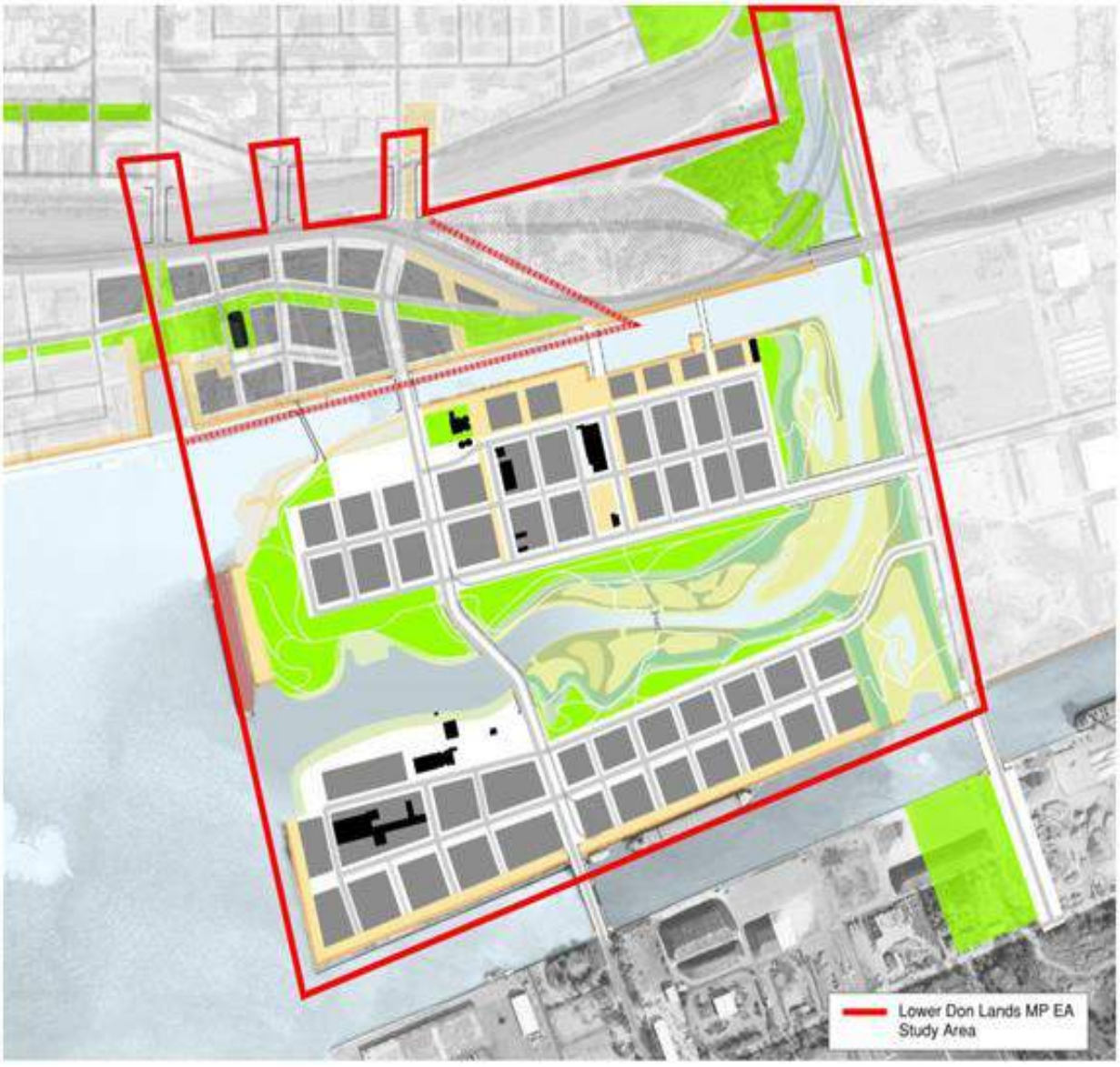
It is anticipated that by 2031 terrestrial and aquatic habitat conditions will be much improved. Plans and studies reviewed to establish future conditions include the precinct plans for the West Don Lands, East Bayfront, and Lower Don Lands and North Keating, the Don Mouth Naturalization Study, the Port Lands Flood Protection Project, Port Lands Transportation and Servicing Master Plan and the Toronto Waterfront Aquatic Habitat Strategy. The Toronto Waterfront Aquatic Habitat Strategy is an ecosystem management plan to maximize the potential ecological integrity of the Toronto waterfront as various plans evolve. The strategy applies to all future development along Toronto's waterfront and states that emphasis for future development should be placed on opportunities associated with shoreline management projects such as erosion control and harbour maintenance. It also focuses on incorporating major improvement to aquatic habitat where land development is taking place.

In addition, the goal of this strategy is to restore the interaction between lake, river, and land by designing around the dynamic forces of nature, such as changing lake levels, river flows and

climate, and thereby creating a healthy ecological setting to support sustainable habitat for wildlife and fisheries.

The future conditions reflect plans to capture opportunities for environmental regeneration. The most significant areas where natural environment improvements are expected include the Lower Don River and Keating Channel, particularly with the opportunities planned through the DMNP Project. The improvements anticipated through the implementation of the Lower Don Lands Plan and DMNP Plan are shown in **Figure 3.6**.

Figure 3.6: Lower Don Land Plan and DMNP Project



Beyond providing necessary flood management for much of the Port Lands, the DMNP Project is significant for the natural environment in that it will provide improved green linkages and natural terrestrial habitat areas immediately adjacent to the Don River and Keating Channel. Natural shorelands of watercourses provide important refuge for animals that require upland habitat for some part of their life history (e.g., egg laying areas for waterfowl). The naturalization and habitat restoration of the Don River will also encourage new aquatic habitat and support aquatic species in the area. The significant new green space to be added with the naturalization of the Don River will transform this area from an industrial centre into a natural green waterfront, supporting the continued improvement for terrestrial and aquatic life along Toronto's waterfront. **Figure 3.7** illustrates anticipated future environmental conditions in the study area. Further details regarding how the DMNP and Lower Don Lands Plan will transform this area of Toronto's waterfront are presented in Section 3.3 Urban Design.

The quality of the future natural environment is directly related to the habitat connectivity in the study area. As the future conditions are achieved through redevelopment of the central waterfront and the implementation of the DMNP, the natural environment will improve exponentially, supporting enriched habitat and species throughout the study area.

Figure 3.7: Natural Environment Future Conditions (2031)

3.1.3 Soil and Groundwater

This section contains a description of the soil and groundwater conditions in the study area including geologic and hydrogeological characteristics. The study area is located within the Iroquois Plain physiographic region. Native overburden deposits consist of clay till and sand from glacial Lake Iroquois. The underlying bedrock is pale grey to cream shale, fossiliferous limestone, dolostone and siltstone from the Upper Ordovician age Georgian Bay formation. The upper 2 metres (m) of the shale is generally heavily weathered.

Locally, the overburden soils consist of depths of fill up to 8 m to 10 m placed through historical lake filling during the late 19th and early 20th centuries. In 1912, the Toronto Harbour Commissioners initiated the conversion of approximately 1000 acres of marsh and shoreline into a waterfront industrial area, including channelling the Don River, constructing concrete dockwalls, and dredging millions of tons of sand to create the Port Lands. The shoreline was filled with dredged sediment from the Inner Harbour but the fill also reportedly included construction debris, excavated soil, sewage sludge, incinerator refuse, timber, concrete, and municipal garbage. Native soils consisting of former lake bottom sediments have been observed underlying the fill materials, and overlying bedrock.

A layer of fill material of varying thickness covers the entire study area. These fill materials are expected to be comprised of soft soils from dredging and excavation spoils from other areas of Toronto. Additionally, the fill materials are anticipated to contain rubble and previous shoreline structures. These fill materials are expected to present challenges to construction based on their limited geotechnical engineering suitability. The presence of rubble and subsurface structures could present difficulties for caisson or soldier pile installation and/or excavations. Not all excavated soils resulting from construction would be reusable from a geotechnical perspective and would need special handling, management, and potentially off-site disposal at licensed landfills. It has been noted that in some cases the fill layer is oil-impregnated likely from pipeline leakage in the area.

Lands within the study area have been historically used for fuel oil bulk storage (Gulf Oil Canada Limited), oil refinery (British-American Oil Company). The aerial photograph in **Figure 3.8** is from 1964 and shows the Keating Channel Precinct area industrial land uses during the construction of the east end of the Gardiner Expressway.

The contaminants detected in the soil include metals, polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons (PHCs), volatile organic compounds (VOCs) (including chlorinated solvents), and general chemistry parameters. These contaminants have been detected at concentrations above the MOECC Guidelines for Background and Generic Site Condition

Standards (2011). The contaminated soil depths north of the Keating Channel have been reported to extend to depths of 3 metres below ground surface east of Cherry Street.

Figure 3.8: 1964 Aerial Photograph of Keating Channel Precinct Area

The presence of contaminated soils and the need for specific remediation strategies have been noted as a requirement with any development strategy in the Keating Channel Precinct area. A detailed 2009 Subsurface Investigation was carried out for the area south of the Keating Channel for the Toronto Region Conservation Authority as part of the Don Mouth Naturalization and Port Lands Flood Protection Project. This assessment reports contaminants of concern within the soil and groundwater in the area including light and heavier fraction petroleum hydrocarbons (PHCs), chlorinated and non-chlorinated organic compounds, heavy metals, polychlorinated biphenyls (PCBs), and general chemistry parameters.

Soils in the Gardiner - Lake Shore Boulevard corridor are further compromised given the potential for migration of impacted groundwater into the study area from upgradient sources. In general, groundwater is expected to migrate regionally from upgradient inland areas downgradient towards water bodies within and adjacent to the study area, that being the Don River, the Keating Channel, and Lake Ontario.

Groundwater levels within the Keating Channel Precinct area were noted as shallow, approximately 0.7 to 3.9 m below ground surface, and generally observed within the fill materials. Groundwater readily infiltrated into test pit excavations. In addition, shallow water table conditions as well as proximity of some sections of the study area to water bodies will create conditions where significant water inflow to any excavations will be likely to occur. Shallow water table conditions will require groundwater control measures to be implemented. Dewatering for many construction activities is required.

Previous investigations indicate that bedrock is encountered at a depth of approximately 10 m and 12 m in the portion of the study area west of Cherry Street and at greater depths in the area between Cherry Street and the Don River. A deep bedrock valley has been identified some 300 m west of the Don Valley Parkway with a sudden drop of up to 25 m noted in the bedrock surface elevations along the Gardiner Expressway corridor. Having a width of about 200 m, this valley crosses the Gardiner and continues southward.

The soil and groundwater conditions are of importance when considering the costs and complexity of infrastructure construction in the study area.

3.1.4 Stormwater Management

Existing and future stormwater baseline conditions were established by reviewing available historical records, precinct plans and conceptual stormwater plans for developing neighbourhoods. Federal, provincial and municipal SWM policy and guidelines were also reviewed to establish applicable stormwater management (SWM) criteria. A number of EAs have been carried out within the study area. These documents were the primary references reviewed in establishing existing and future stormwater conditions. These include, but are not limited to the following key studies:

- Don Mouth Naturalization and Port Lands Flood Protection Project EA (DMNP EA, 2013);
- Lower Don Lands Class EA (LDL EAMP, 2010);
- East Bayfront Class EA Master Plan (EBF Class EAMP, 2006);
- West Don Lands Class EA Master Plan (WDL Class EAMP, 2005);
- Port Lands and South of Eastern Transportation and Servicing Master Plan EA.

Recent Addendums to the above EAs were also reviewed as part of this report. This information has been incorporated into this report and represented graphically where possible. In addition to the above studies, many other reports, policies and documents were reviewed from a SWM perspective to understand the baseline conditions and identify constraints/opportunities for the undertaking. These included the *Don River and Central Waterfront Project EA*, the *Lower Don River West Remedial Flood Protection Project Class EA*, the *Toronto Wet Weather Flow Management Policy*, the *Port Land Acceleration Initiative* (PLAI), *Toronto Design Criteria for Sewers and Watermains*, *Ministry of the Environment Stormwater Management Planning and Design Manual*, and TRCA requirements to name a few.

SWM policies have evolved significantly since the development of the Gardiner Expressway and Lake Shore Boulevard. Most storm sewers in older neighbourhoods, such as those in the study area, were designed for minor system conveyance only (e.g., 2-year storm event) and do not include inlet control devices or ways to prevent sewer surcharge. As well, most neighbourhoods do not have engineered overland flow routes (for major system conveyance) to control pooling surface water depths. Where new development has occurred or is planned, the future conditions will reflect current and future policies and standards.

The study area is located entirely within the Don River watershed. The entire watershed area of the Don River is 360 km^2 which stretches southward 38km from the river headwaters in the Oak Ridges Moraine to the river outlet into the Keating Channel. Flooding along the Don River has been recorded since the mid-1870s; however significant urbanization of the watershed has severely altered the hydrogeological functioning of the natural watershed. Most of the flooding over the past few decades has resulted in nuisance type flooding, however the watershed would be subject to extensive flooding under a tropical storm similar to Hurricane Hazel (the regulatory flood event).

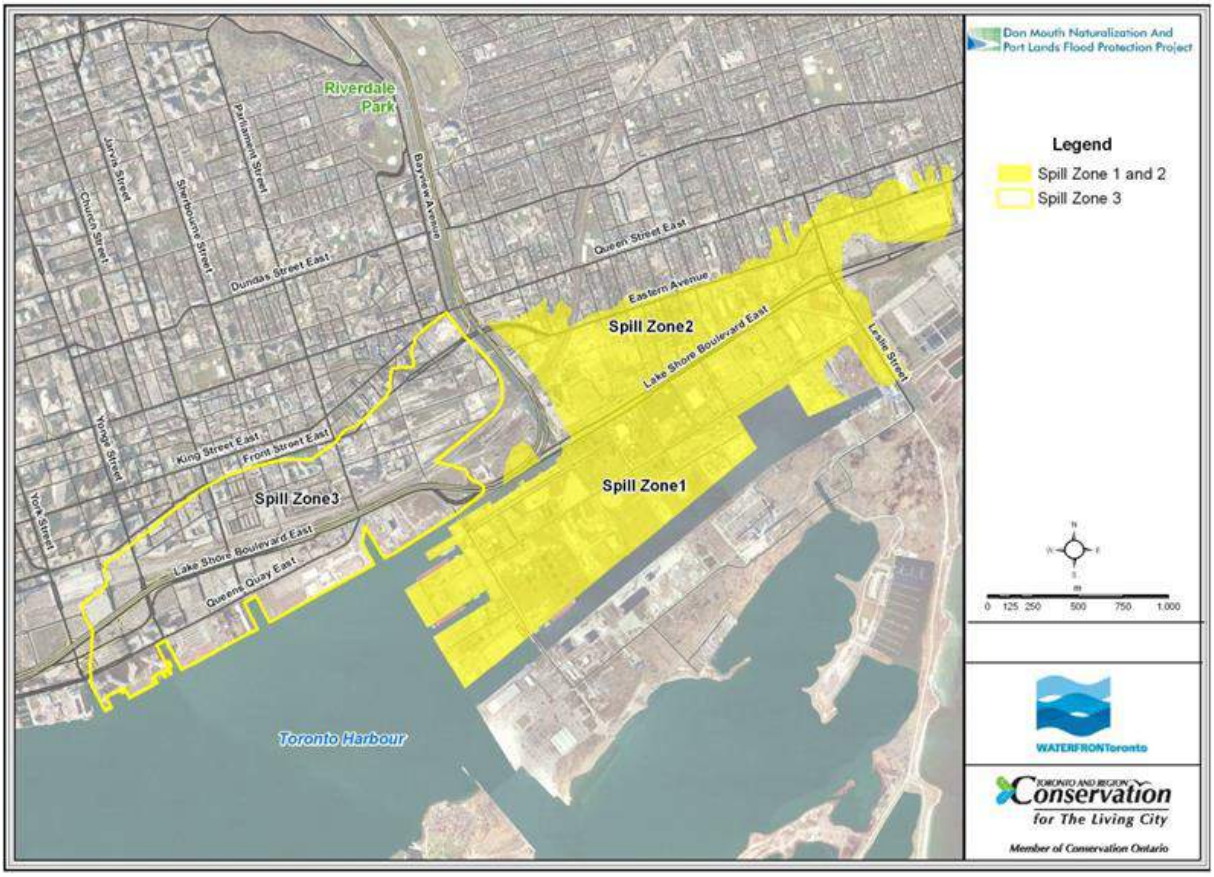
Under existing conditions the regulatory floodplain covers an area of 290 ha from the Don River to Woodbine Avenue in the east (refer to **Figure 3.9**). The floodplain can be divided into two areas: Spill Zone 1 (south of the Keating Channel and Lake Shore Boulevard), and Spill Zone 2 (east of the Don River). Prior to the construction of the Lower Don River West Flood Protection Landform (referred to as the West Don Lands FPL) there was a third Spill Zone which extended west of the Don River. The reduction in the floodplain area was achieved through the construction of the flood protection landform which allowed the development of the West Don Lands to proceed.

Spill Zone 1 and 2 still exist but will be eliminated with the implementation of the DMNP as the naturalization of the Don River Mouth, with a newly designed spillway, will accommodate stormwater from peak storm events. The implementation of the DMNP would therefore open up the land in Spill Zones 1 and 2 for redevelopment.

Stormwater drainage from the Gardiner Expressway does not outlet directly to the Don River. Deck drainage along the elevated Gardiner Expressway is collected in depressed basins (hoppers) on the roadway shoulders and discharged through pipes that convey drainage to the ground beneath the Expressway. Where this is not possible, drainage is discharged into the City's sewers along Lake Shore Boulevard. Along Lake Shore Boulevard, storm sewers are separated from sanitary sewers; however, many storm sewers discharge into combined sewer overflows (CSO trunks). Between Yonge Street and Logan Avenue, there are five storm/CSO trunks that cross Lake Shore Boulevard (at Lower Yonge, Lower Jarvis, Lower Sherbourne, Small and Cherry Streets); the latter three serve as outlets for storm sewers servicing Lake Shore Boulevard from Lower Jarvis Street to just east of Cherry Street. Some storm systems originate beyond the study area (e.g., west of Lower Yonge Street) and flow into the study area while others are confined to the boundaries.

East of Cherry Street there are several direct storm outfalls: five outfalls from Lake Shore Boulevard sewers to the Keating Channel, two outfalls from Don Valley Parkway ramp sewers to the Lower Don River and one further storm sewer outlets from the Gardiner Expressway to the Don River. Existing storm sewers discharge to outfalls or CSOs without any SWM quantity or quality controls. Under heavy rainfall, the Cherry Street underpass at the railway corridor experiences flooding due to the large catchment area draining to this point. The CSO on Cherry Street south of the underpass is also surcharged under current development under the City of Toronto 2-year design flow rate. Periods of high Lake Ontario water level conditions further exacerbate the situation as backwater extends into the CSO outlet in these conditions.

Figure 3.9: Regulatory Flood Spill Zones for the Lower Don



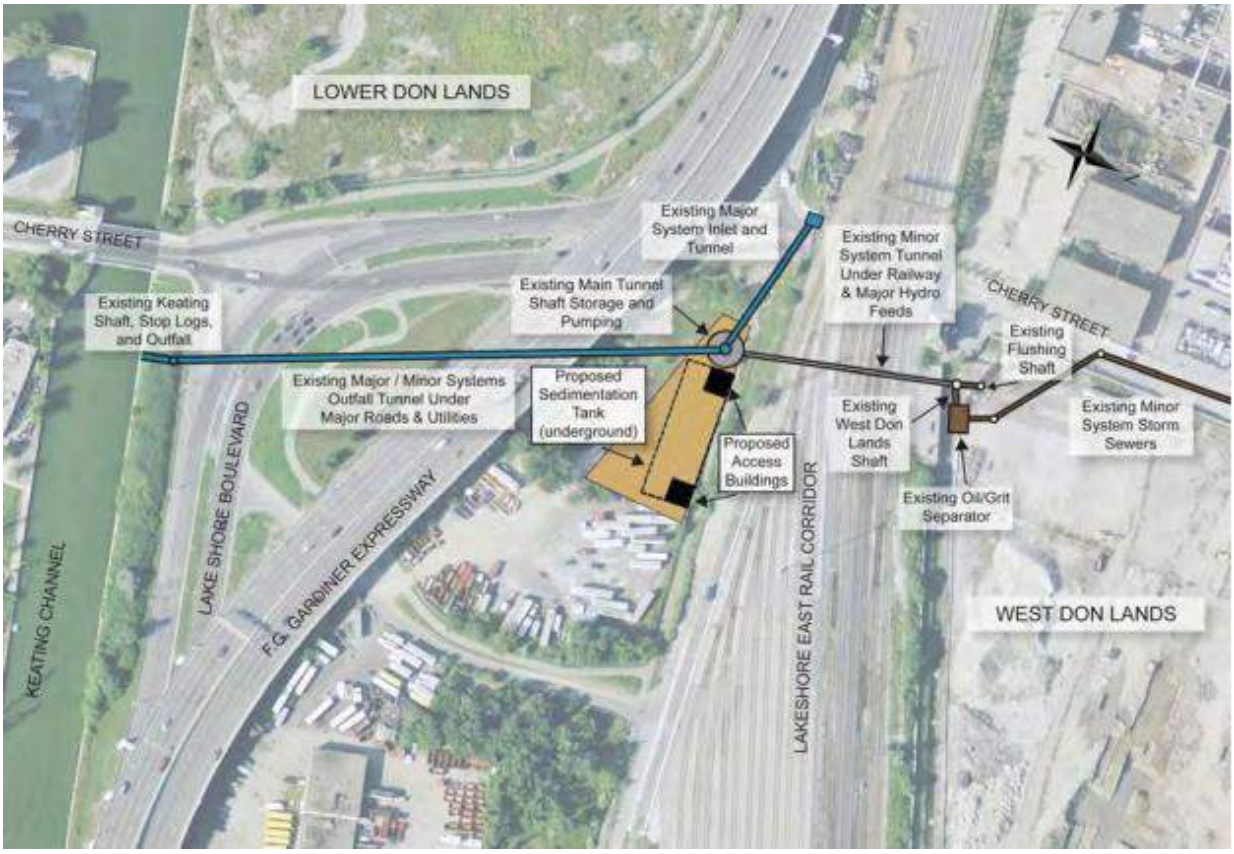
As part of the drainage plans for new development in the West Don Lands (WDL), the WDL EA recommended that stormwater be treated by an end-of-pipe facility located on the north side of the railway corridor, east of Cherry Street. This treatment facility consists of an oil-grit separator (OGS), filtration and ultra-violet disinfection. In late 2012 a new stormwater outfall associated with this facility was constructed to convey and treat stormwater for the WDL, primarily consisting of:

- Outfall tunnel to Keating Channel;
- Stormwater storage shaft and pumping at 480 Lake Shore Boulevard;
- Major system inlet (for overland flow) from the low point at Cherry Street; and,
- Minor system inlet (for local storms) from the WDL.

A 2013 addendum for the WDL EA revised the proposed end-of-pipe facility. As noted previously, some features of the proposed storm sewer quality concept had already been constructed in order to alleviate flooding at the Cherry Street underpass. The 2013

modifications expanded the treatment capacity of the stormwater quality facility at 480 Lake Shore Boulevard to include areas in East Bayfront (to the west) and Keating Channel Precinct. **Figure 3.10** shows the revised stormwater quality concept for the WDL which has been constructed.

Figure 3.10: West Don Lands Class EA Addendum for Stormwater Quality, New Facilities



The current storm sewers within the Keating Channel Precinct have not been assessed for their capacity to address the future development, however, it is expected that due to the proposed changes to the land use for the area, and the need to address both SWM quality and quantity issues, the existing storm sewer system will not be adequate to meet the future needs. Therefore, it is expected that all the existing storm sewers within the Keating Channel Precinct will be replaced.

The DMNP EA was carried out to address the risk of flooding to 290 ha of urban land (Spill Zone 1 and Spill Zone 2) and to naturalize the mouth of the Don River (Don Mouth). The conceptual design for the DMNP consists of:

- Flood protection features;
- Sediment, debris and ice management;
- Naturalization;
- Opportunities for recreation features associated with the new river valley system and parkland outside the floodplain; and,
- Integration with the Lower Don Lands Planning and servicing.

Figure 3.7, presented earlier under Natural Environment, illustrates the future condition of the study area including the DMNP and Lower Don Lands plans.

The 2010 *Lower Don Lands Class EA Master Plan* (LDL EAMP) was carried out in close coordination with the DMNP EA and integrates the results of the Port Lands Acceleration Initiative (PLAI). The study area for the DMNP EA is similar to that of the LDL EAMP. As such, the LDL EAMP also addresses the municipal infrastructure servicing requirements necessary to be relocated as a result of the DMNP EA and/or to support the land uses proposed as part of the revitalization of the LDL area.

The 2010 LDL EAMP recommended an integrated treatment train approach to SWM planning within the LDL area, comprising of source controls, conveyance controls and end of pipe controls. The preferred stormwater quality treatment alternative for the Keating Channel Precinct was a common stormwater quality facility (SWQF) optimized to meet water quality targets and sized based on available space. This alternative consisted of oil-grit separators, ultra-violet treatment; storage areas and seepage/riverine wetlands.

Regarding stormwater quantity control, the proposed re-development of the LDL area will require the removal of much of the existing storm drainage infrastructure as the site is re-graded to elevate the existing ground for flood protection; to create the new river channel; and to create the flood protection spillway. The existing stormwater drainage system will need to be replaced with a modern SWM system as outlined in the LDL EAMP Addendum 2014.

The SWM plans for the Port Lands and South of Eastern are being confirmed through the *Port Lands and South of Eastern Transportation and Servicing Master Plan EA* (TSMP EA) that is currently underway. The TSMP EA considers the recommendations of the completed Don River and Central Waterfront Project EA and is being coordinated with other EAs currently underway within and adjacent to the study area. Typical stormwater related issues exist within the Port Lands and South of Eastern TSMP EA study area. In the Port Lands, there is little infrastructure south of the Ship Channel and as a result, all stormwater runoff is ponded in low lying areas or conveyed via overland flow routes via the Ship Channel or directly to Lake Ontario. North of the

Ship Channel, drainage is directed from the north to the south. There is some infrastructure that has been designed and placed to meet the immediate needs of each development. Within the Port Lands little to no SWM measures exists to meet the requirements of the Toronto Wet Weather Flow Management Guidelines.

The South of Eastern area has been identified in the City's Basement Flooding Protection Program as part of Study Area 32 experiencing chronic basement flooding. The Class EA Study for Area 32 identified a number of sewer upgrade projects to mitigate current basement flooding risks. While the South of Eastern portion of the study area has no combined sewers, the planned sewer upgrades within Area 32 (along Eastern Avenue and to the north of Eastern Avenue) may cause a potential hydraulic impact.

Overall, water quality for the Lakefront is similar to the discharges from the Don River; there are concerns due to the existing combined sewers that have the potential to spill directly into the lake untreated. The Don River and Central Waterfront Project EA, includes plans to capture and treat polluted stormwater and raw sewage from combined sewer overflows before they enter the lakefront. As a result, the investigations call for the upgrades to the City's critical sanitary trunk sewer infrastructure to improve operations and service future growth. It is the City's objective to reduce Combined Sewer Overflows (CSO) and mitigate the amount of pollution entering local water bodies, such as the Don River and Toronto Inner Harbour. Plans for SWM improvements to address the City's objectives for the Central Waterfront through the Port Lands and South of Eastern TSMP EA are still being confirmed. The future conditions of the Gardiner East design will recognize these improvements as they are designed and implemented.

3.1.5 Air Quality & Noise

3.1.5.1 Air Quality

The existing conditions of the air and noise environment of the study area are typical of a highly urbanized environment. Air pollutants in the City of Toronto originate from a variety of sources including industry, transportation, fuel combustion, and miscellaneous activities (primarily dry cleaning, painting, solvent use, and fuel marketing). In addition, soil and groundwater conditions also impact air quality. Due to Toronto's dense population, large number of vehicles, industry, light winds, and summer temperatures, the city also provides good conditions for the formation of ground-level ozone and thus air-quality issues arise periodically.

The compounds of concern (COCs) considered in the background characterization are listed below and were identified in consultation with the MOECC. The Ministry of Transportation's

Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects (the Guide) also identifies that the most important air quality indicator compounds to be considered for transportation projects are those listed below:

- Criteria Air Contaminants (CACs), including: carbon monoxide (CO), nitrogen oxides (NOX (focus on NO and NO2)), total suspended particulate (TSP), particulate matter with aerodynamic diameter <10µm (PM10), and particulate matter with aerodynamic diameter <2.5µm (PM2.5).
- Volatile Organic Compounds (VOCs), including: benzene, 1,3-Butadiene, formaldehyde, acetaldehyde, and acrolein.

For the greenhouse gas emissions assessment, the principal transportation related GHG is carbon dioxide (CO2). Other important GHGs include methane (CH4) and nitrous oxide (N2O). The relative impacts of various GHGs are often expressed in terms of their global warming potential (GWP) relative to CO2. GWP represents a basis for combining the emissions of individual greenhouse gases by normalizing individual mass emission rates, based on the ability of each greenhouse gas to trap heat in the atmosphere relative to CO2 over a specified time horizon.

As per the Guide, the 70th percentile of the most recently measured and complete concentration data from the nearest MOECC or Environment Canada air quality monitoring station are representative as the background concentration levels to be used in the comprehensive air quality analysis.

Background concentrations for TSP, PM2.5, NO2 and CO, were reviewed based on the data collected from the MOE ambient air quality monitoring stations located in the downtown area. The Volatile Organic Compounds (VOCs) and BaP background concentrations were reviewed based on the ambient air quality data collected from Environment Canada's (EC) National Air Pollution Surveillance (NAPS) stations. Data were collected for the most recent available consecutive 3 years (2012 and prior). Analysis of three consecutive years of ambient air quality data was done based on this approach being aligned with the methodologies for assessing achievement of the Canada-Wide Standards (CWSs).

The Gardiner Expressway is a contributor to air quality conditions within Toronto, particularly along the Waterfront, however it is one of the many contributors. Air quality near to the Gardiner Expressway would be expected to have higher concentrations of indicator compounds

than areas further setback from the Expressway. However this phenomenon is expected to be fairly localized.

A review of air quality measurements from across Toronto show strong similarities in data from geographically diverse stations. While there is no publicly available long term monitoring close to or adjacent to the Gardiner, the MOECC station at Resources Road (near Highway 401) can be turned to as an indicator of impact of a major traffic corridor on air quality. The Resource Road station monitors similar ranges of indicator compounds as stations located elsewhere in the City and away from a major transportation route.

Representative background air quality levels for contaminants of concern for the Gardiner corridor are presented in **Table 3.2** (using the Resources Rd. Monitoring Station). Note that ambient air quality monitoring data for PM10 was not available. PM10 was estimated assuming that PM2.5 accounts for ~60% of PM10, which is based on a research conducted by the MOECC in Ontario ("A Compendium of Current Knowledge on Fine Particulate Matter in Ontario", dated March 1999).

Table 3.2: Representative Background Air Quality Concentrations

Pollutant	Averaging Period	Data Period	70th Percentile (µg/m³)	90th Percentile (µg/m³)	Criteria (µg/m³)	
PM2.5	24-hour	2010-2012	8.17	13	30	Canada-Wide Standard; Ontario AAQC
PM10	24-hour	2010-2012	13.6	22.7	50	Ontario AAQC
NO2	24-hour	2010-2012	41.28	51.47	200	Ontario AAQC
NO2	1-hour	2010-2012	43.24	62.04	400	Ontario AAQC
CO	8-hour	2008-2010	286.25	373.56	15700	Ontario AAQC
CO	1-hour	2008-2010	286.25	400.75	36200	Ontario AAQC

3.1.5.2 Noise

The existing acoustic environment in the study area is influenced by noise generated by road, rail, and marine traffic, loading and unloading of vehicles, heating, ventilation and air conditioning (HVAC) units and rooftop noise, industrial and construction sources, and intermittent aircraft noise. The study area can be classified as a Class 1 Area as defined by the MOECC, that is "an area with an acoustical environment typical of a major population centre, where the background noise is dominated by the urban hum."

Characterizing baseline or existing conditions is a necessary step in understanding the overall noise impacts from the undertaking. The assumed future baseline year was 2031. Baseline conditions were established on a noise sensitive receptor (or 'node') basis within the study area. The study area was divided into segments based on change in traffic related parameters, including: traffic volumes, posted speed limit and percentage of medium and heavy trucks. Based on the review of the traffic related parameters, each segment consisted of a stretch of road between two consecutive intersections. It was conservatively assumed that a node exists in all the segments within the study area. For at grade road segments, the receptor heights were determined based on the review of the potential receptor locations. This included receptor heights of 1.5m and 4.5m above grade, for receptors at ground level and second storey, respectively. The height of 4.5m represents receptors at the plain of second storey window. For elevated roadways (e.g., Gardiner Expressway), a receptor height resulting in maximum noise impact was selected for the modelling.

Future potential receptors were also included in the analysis. The locations, heights and setback distances of those receptors were estimated from the proposed development plans, including the ones for Keating Channel Precinct, West Don Lands and East Bayfront. For some of the nodes, more than one segment of road contributed to the overall noise levels. This was mainly the case for receptors in close vicinity of the Gardiner Expressway, where up to four (4) segments were included: Gardiner eastbound lanes, Gardiner westbound lanes, Lake Shore Boulevard eastbound lanes and Lake Shore Boulevard westbound lanes.

Predicted (2031) sound levels with the Gardiner Expressway in place were developed for hourly sound level equivalent values (1-hour Leq, dBA) at over 160 receptor locations and are available in **Appendix X – Noise Baseline Conditions Report**. Forecasted noise levels for receptors in the Gardiner Expressway-Lake Shore Boulevard corridor ranged from 68 to 78 dBA which were generally higher than sound levels forecasted for other receptor locations in the larger study area. This additional noise level is associated with traffic in the Gardiner-Lake Shore Boulevard corridor.

3.2 Infrastructure & Transportation

The study area for the potentially affected infrastructure extends along the immediate Gardiner Expressway – Lake Shore Boulevard corridor from approximately Lower Jarvis Street to Logan. Avenue where the Gardiner Expressway touches down approximately 150 m west of Logan Avenue, just west of Booth Street. The corridor broadens between Cherry Street and the Don River where it extends from the Keating Channel northerly to the Metrolinx Lake Shore East rail corridor. The Don Valley Parkway is also potentially affected by the project as far north as the Richmond/ Adelaide/Eastern interchange and was therefore included in the description of baseline conditions.

The infrastructure and transportation baseline conditions consider the physical infrastructure as well as the modes and users of the infrastructure which include pedestrians, cyclists, automobiles and truck traffic (i.e. goods movement).

In considering existing and future traffic demand and volume, a larger study area was considered that included lands that extend from Dundas Street to Lake Ontario and from Spadina Avenue to Woodbine Avenue.

Infrastructure and transportation data was collected from numerous available sources (Waterfront Toronto, City of Toronto, utility companies etc.), previously completed studies including environmental assessments, available historical records, and field reviews. Traffic data was based on the City's regional EMME model, available traffic count data, Transportation Tomorrow Survey (TTS) data, and bluetooth survey data.

The existing and future conditions in the study area considered the following:

- Road infrastructure, including expressways, collectors, arterials, and local streets;
- Rail infrastructure, including rail lines and yards;
- Public transit infrastructure;
- Pedestrian and cycling infrastructure;
- Utilities; and,
- River and harbour infrastructure.

It is noted the SWM infrastructure is previously described in **Section 3.1.4** under the Environment lens.

Also described in this report section are the existing and forecasted travel volumes for the Gardiner Expressway and Lake Shore Boulevard.

3.2.1 Roadway Infrastructure

Figure 3.11 illustrates major transportation facilities in the City of Toronto (major roadways and rapid transit facilities), and shows the location of the Gardiner Expressway and Don Valley Parkway in a city wide transportation context.

3.2.1.1 Gardiner Expressway

The Gardiner Expressway extends east from the Queen Elizabeth Way / Highway 427 interchange through the downtown area, ending at the Don Valley Parkway. Construction began on the at-grade segments of the Gardiner Expressway west of the City in 1955. In 1958, construction began on the elevated segments from Dufferin Street through the central downtown area, reaching York Street by 1962, the Don Valley Parkway by 1964, and finally Leslie Street by 1966. In the study area the elevated Gardiner Expressway runs generally above or to the north of some sections of the ground-level Lake Shore Boulevard from Jarvis Street easterly.

It has a posted speed limit of 90 km/h. The Expressway is elevated for a 6 km section between Dufferin Street and the Don Valley Parkway, with numerous on- and off-ramps parallel and adjacent to the mainline structure between Spadina Avenue and Parliament Street (the on- and off-ramps within the study area are illustrated schematically in **Figure 3.12**). The Expressway has a six-lane basic cross-section for the majority of its length. There are some exceptions where six lanes are not present. Eastbound between the York/Bay/Yonge off-ramp and the Rees on-ramp there are only two eastbound lanes Westbound between the Yonge/Bay/York off-ramp and the Jarvis on-ramp there are only two westbound lanes. The section between the Don Valley Parkway and the Jarvis/Sherbourne ramps consists of four lanes per direction (total of eight lanes).

The elevated Gardiner Expressway in the study area is made up of a series of concrete bridge deck slabs on girders held up by wide pier caps supported by rows of piers. The piers are either 2-legged or 3-legged in this section. This arrangement generally consists of reinforced concrete cap beams which support steel and concrete girders with rectangular vertical columns. The cap beam and supporting columns are generally referred to as a “bent”. The bridge deck and piers are over 40 years old and past the end of their normal service life. Comprehensive deck and pier rehabilitation is required on an annual basis to keep the expressway safe for use.

Figure 3.11: Major Roadways and Rapid Transit Facilities, City of Toronto

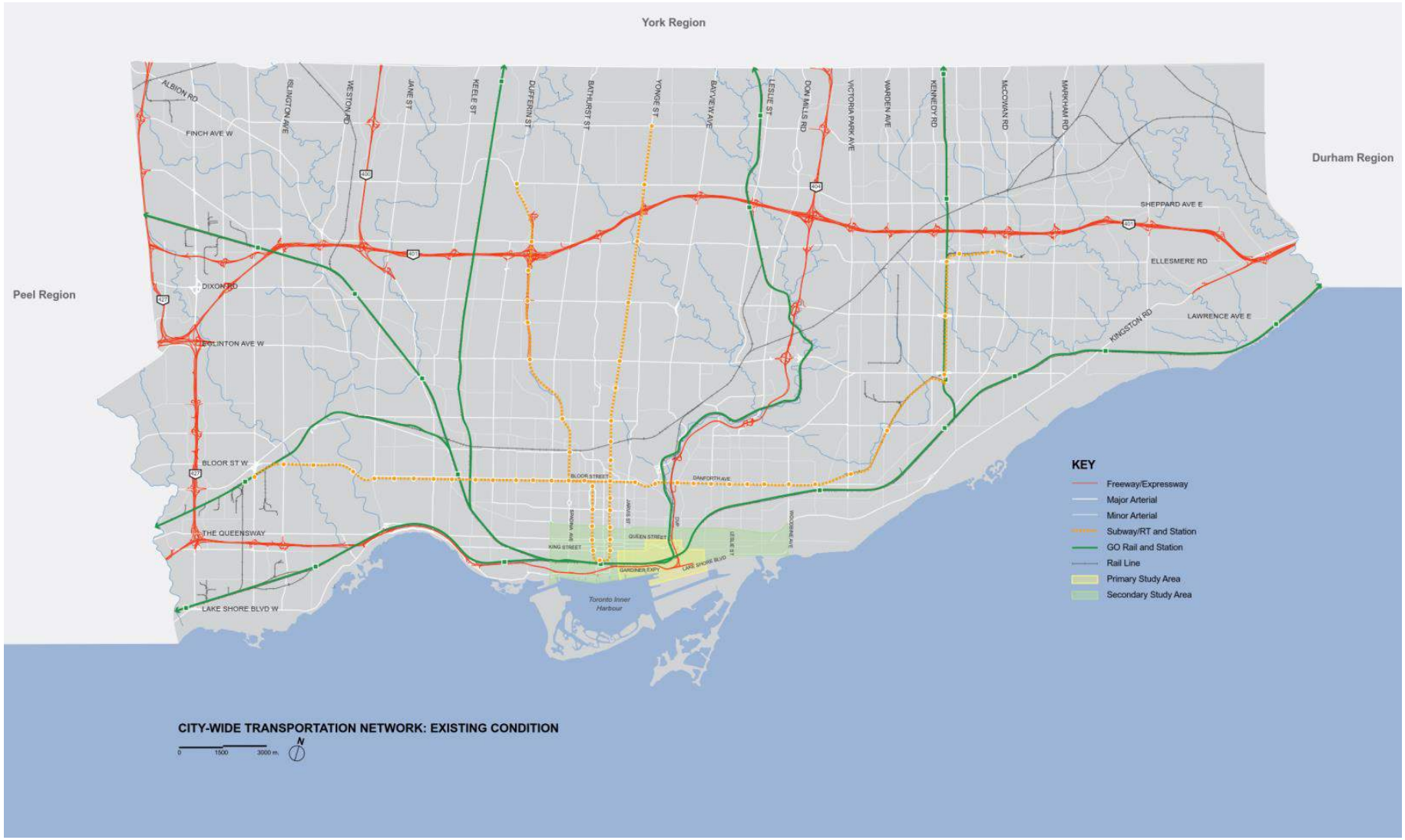
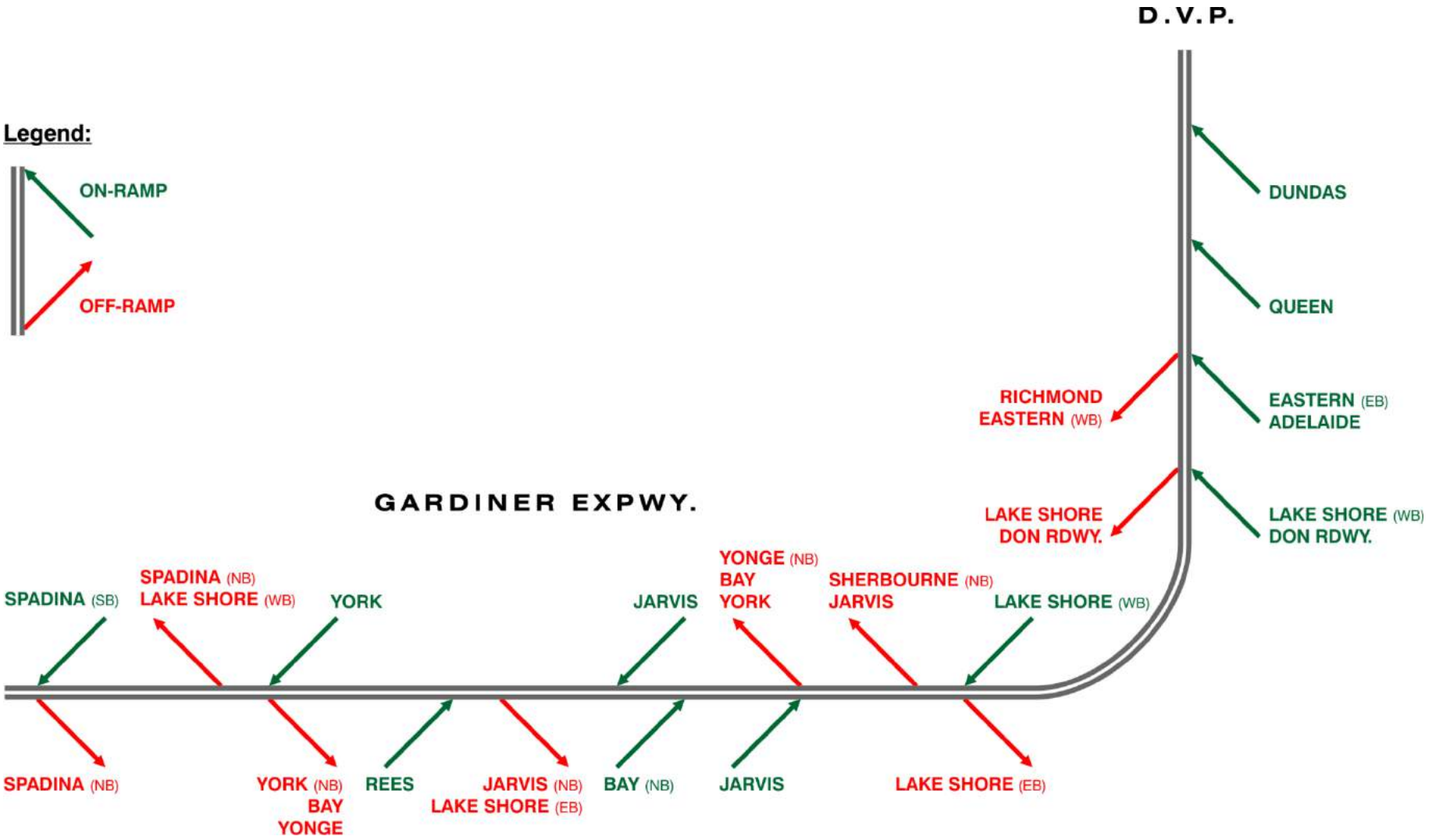


Figure 3.12: Gardiner Expressway On- and Off-Ramps



Starting from 1990, after 30 years of usage, the elevated structure has experienced serious deterioration. Programmed repair contracts issued by the City of Toronto have been carried out ever since. Those general repairs included:

- Local deck repairs;
- Total deck replacement;
- Expansion joint replacement and link slab to eliminate expansion joints;
- Deck stitching of joints to eliminate longitudinal expansion joint;
- Bearing replacements;
- Bent repairs and the steel girder coating;
- New deck drainage system; and,
- Signage works.

3.2.1.2 Don Valley Parkway

The Don Valley Parkway (DVP) is a six-lane expressway, posted at 90 km/h, that connects the two major east-west highways in Toronto, the Gardiner Expressway and Highway 401. The DVP serves downtown Toronto access to/from the eastern part of the city via the Richmond / Adelaide ramps, functions as a central area bypass route (in combination with the Gardiner Expressway), feeds traffic to/from downtown from the south via the Gardiner, and connects with the waterfront via the Don Roadway. The southbound exit from the DVP to Richmond Street utilizes a single lane exit ramp to Eastern Avenue and continues only to the west on Eastern or Richmond Street. About half of the south bound volume in the AM period exits at this ramp.

To the south, the DVP terminates and transitions to the Gardiner via two-lane on-off ramps to the Don Roadway. While the two expressways are separate facilities they are commonly perceived as serving a continuous through function. The DVP/Gardiner ramps have a design speed of approximately 70 km/h. The posted speed on these ramps is 60 km/h. The DVP connecting ramps have grades of 3.85% for the N-W ramp (i.e. from the north to the west) and 6.0% on the W-N ramp. These ramps have curvature radii of 290 m (N-W ramp) and 250 m (W-N ramp). The LSB connecting ramps have grades that vary from 3.7 % to 5.6% for the eastbound off-ramp and 1.5% to 5.6% for the westbound off-ramp. The connecting ramps all have minimal inside and outside shoulders.

The transition to the Don Roadway is via sub-standard (notably in the southbound direction) single lane entry-exit roadways. The horizontal and vertical alignments of each direction of the

Don Roadway where it is adjacent to the DVP ramps are constrained by the piers and retaining walls of the DVP ramps, thus creating the substandard geometry.

North of the local study area, there are northbound on-ramps from Queen Street and Dundas Street. The Bloor Street / Bayview Avenue interchange also provides downtown access, predominantly to the north end of downtown.

3.2.1.3 Lake Shore Boulevard & Other Arterials

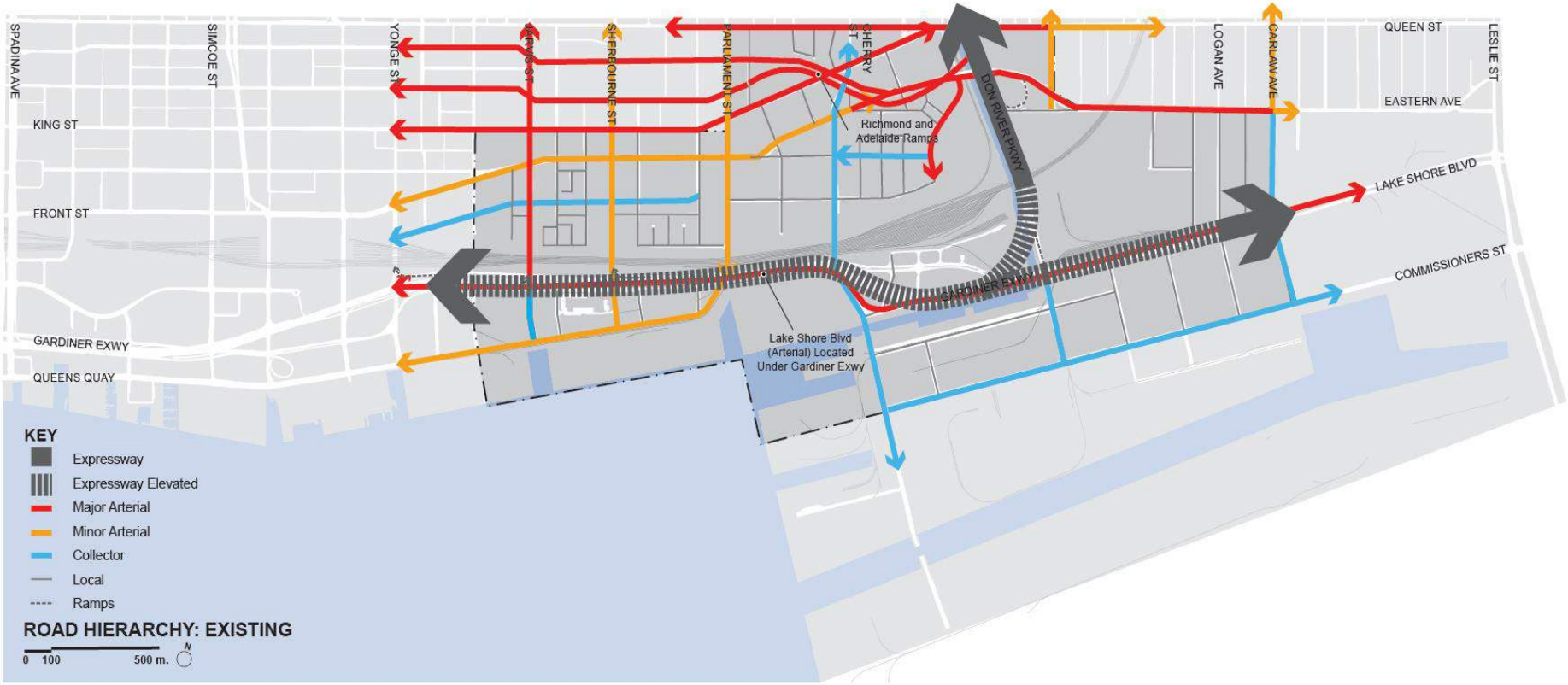
Lake Shore Boulevard in the study area is a 6-lane divided roadway classified as a major arterial with a posted speed of generally 60 km/h with some sections posted at 50 km/h (eastbound from west of Yonge Street to Richardson Street; westbound from Sherbourne Street westerly). A portion of Lake Shore Boulevard in the Cherry Street area is positioned completely south of the Gardiner and the eastbound lanes between Lower Yonge Street to just east of Bonnycastle Street are positioned south of the Gardiner. Elsewhere Lake Shore Boulevard is situated directly under the Gardiner Expressway deck.

Lake Shore Boulevard operates as separate one-way roadways. Because of the Gardiner Expressway, Lake Shore Boulevard, and the Expressway ramps are typically parallel to each other in a confined right-of-way, Lake Shore Boulevard also serves as a connection between the on- and off-ramps and the north-south roadways entering downtown. East of the Don Valley Parkway, Lake Shore Boulevard continues to the east as a six-lane major arterial, and ultimately ending at Woodbine Avenue.

The majority of the study area is characterized by an interconnected grid network of arterials with short block spacing. In some cases this grid system is broken by geographic, transportation, or land use constraints (predominantly the rail corridor, Gardiner Expressway and Lake Shore Boulevard, but also the Don River / Don Valley Parkway and the south of Eastern Avenue employment corridor to the east).

Within the study area, Lake Shore Boulevard intersects with several major arterial roadways with full traffic signalization provided at Lower Jarvis Street, Lower Sherbourne Street, Parliament Street, Cherry Street (north and south), the Don Roadway and Carlaw Avenue. Unsignalized T-intersections exist at Richardson Street, Bonnycastle Street, Small Street, Saulter Street, Bouchette Street, Booth Avenue and Logan Avenue (both sides). See **Figure 3.13**.

Figure 3.13: Study Area Road Hierarchy



There are also ten movements currently prohibited at six intersections along Lake Shore Boulevard, as shown in **Table 3.3**. Under future baseline conditions, there will be eight movements prohibited at eight intersections. Lake Shore Boulevard has a limited number of private driveway connections to adjacent land uses, mostly to industrial properties. Just east of Cherry Street is the entrance to GO Transit's Sorting Yard and layover site. Just east of Jarvis Street there is a service (truck) entrance to the Loblaws site for eastbound traffic. East of the Don River, Lake Shore Boulevard is essentially access-restricted except for one gas station on the south side at Carlaw Avenue. Several Lake Shore Boulevard "median slip-offs" exist throughout the study area for access across the opposing lanes.

Table 3.3: Prohibited Turning Movements at Lake Shore Boulevard Intersections

Intersecting Street	Prohibited Turning Movements	
	Existing Conditions	Future Baseline Conditions
Yonge Street	1. SB left turn	1. SB left turn
Jarvis Street	2. EB right turn from EB Gardiner off-ramp 3. EB left turn from Lake Shore 4. WB left turn from Lake Shore	2. EB right turn from EB Gardiner off-ramp 3. EB left turn from Lake Shore 4. WB left turn from Lake Shore
Sherbourne Street Construction completed 2015	5. WB right turn from Lake Shore (WB Gardiner off-ramp feeds into Lake Shore immediately east of intersection)	5. WB right turn from Lake Shore (WB Gardiner off-ramp feeds into Lake Shore immediately east of intersection)
Parliament Street	6. EB right turn	none
Trinity Street	[n/a]	6. WB left turn
Cherry Street West intersection East intersection	7. EB left turn 8. WB left turn	none
Munition Street	[n/a]	none
Don Roadway	9. WB left turn 10. EB left turn	7. WB left turn 8. EB left turn

3.2.1.4 Future Roadways

In 2031 the Gardiner Expressway east of Jarvis Street would largely exist as it is today with the planned deck rehabilitation works being fully completed. West of Jarvis Street there are significant changes planned for the Gardiner ramp connections. Firstly, the York/Bay eastbound off-ramp will be removed and a new off-ramp landing just west of Simcoe Street will be constructed. The detailed design for this work is completed and construction is expected to be finished in 2017. The Bay Street eastbound on-ramp to the Gardiner has EA approval to be removed, but this project is unfunded. *The Lower Yonge Precinct Transportation and Serving Master Plan EA* (which covers the area of Yonge Street to Jarvis Street and Lake Shore Boulevard to Queens Quay Boulevard) includes a task item to prepare a 10% design for the Bay Street ramp removal. This is required in order to determine the feasibility of, and make a recommendation on the shortening of the eastbound Jarvis off-ramp so that it would land on the west side of Yonge Street. Phases 3 and 4 of the *Lower Yonge Precinct Transportation and Servicing Master Plan EA* are currently underway and completion is anticipated in early 2017. In regards to Lake Shore Boulevard, from Cherry Street to the Don River, the roadway is proposed to be realigned to a more northern location as per the *Keating Channel Precinct Plan* and the *Lower Don Lands and North Keating Precinct EA* (note that this plan proposes lane reductions from three to two lanes per direction on Lake Shore Boulevard. in the Keating Channel Precinct section). Other planned changes to the area's roadways include:

- The relocation of Cherry Street to the west from north of Polson Street to just south of the rail corridor;
- The extension of Queens Quay easterly, across to a relocated Cherry Street (east of Cherry Street, Queens Quay is proposed to be extended as a local, one-way road); and,
- A new local road network is proposed for Lower Don Lands and North Keating area from just west of the Don Roadway to west of the relocated Cherry Street.

In addition, the *Port Lands and South of Eastern Transportation and Servicing Master Plan Environmental Assessment* is assessing future roadway requirements in the area east of the Don River, south of Eastern Avenue. This Master plan is proposing, among other infrastructure improvements, the extension of Broadview Avenue from its current terminus at Eastern Avenue south with a new crossing of Lake Shore Boulevard east of Saulter Street.

3.2.2 Pedestrian and Cycling Facilities

3.2.2.1 Pedestrians

The condition and experience of pedestrian facilities varies dramatically between the pedestrian environment north of the rail corridor and the pedestrian environment south of the rail corridor, particularly along and across Lake Shore Boulevard. The waterfront revitalization has included significant improvements to the pedestrian environment along Queens Quay Boulevard and connecting to the water's edge. However, pedestrian connections along and across Lake Shore Boulevard remain a reflection of the industrial past and signify the barrier that Lake Shore Boulevard currently poses for pedestrians.

The majority of the downtown area north of the rail corridor was developed prior to the auto era, and while there have been significant changes in development in the subsequent decades, the street network maintains many of the qualities that are conducive to pedestrian activity. These include the configuration of the network (generally a fine-grained block pattern with short block spacing), right-of-way cross-sections including building setbacks, and urban design in general (e.g., promoting active uses adjacent to the sidewalk). Other traffic engineering principles have been implemented that can be considered pedestrian-friendly, including short traffic signal cycle lengths, vehicle turn restrictions at intersections with significant pedestrian demand, controlled crossing locations at frequent intervals (traffic signals and pedestrian crossovers), and pedestrian countdown signals.

South of the rail corridor, pedestrian facilities along and across Lake Shore Boulevard are generally poor. Sidewalks exist along the south side of the roadway from Jarvis Street to Bonnycastle Street. From Bonnycastle to Parliament Street, no formal sidewalks exist although a route for pedestrians is possible. Then from Parliament Street, east, the off-road Martin Goodman trail exists on the south side. Many of the intersections require two stage crossings and lack wayfinding markings on the roadway. Furthermore, the overhead expressway columns create blind spots making it difficult for drivers to see pedestrians while waiting to cross the roadway at some of the intersections. The short local streets extending from Lake Shore Boulevard to Queens Quay (Richardson Street; Bonnycastle Street; Small Street) do not have sidewalks. Jarvis Street, Sherbourne Street and Parliament Street have sidewalks that meet the general standards for minimum sidewalk width, but have obstructions (street light / traffic signal poles; fire hydrants; bus shelters) that do not meet the minimum clear width guidelines.

Figure 3.14 illustrates pedestrian features within the Lake Shore Boulevard / Queens Quay corridor between Yonge Street and Carlaw Avenue, including features accommodating pedestrian travel and other constraints that limit, restrict or discourage pedestrian travel.

Figure 3.14: Existing Pedestrian Facilities and Barriers, Lake Shore Boulevard and Queens Quay Corridors

As shown in **Table 3.4**, there are four intersections along Lake Shore Boulevard within the study area where north-south pedestrian crossings are prohibited on one or both sides of the intersection, and two intersections where north-south crossings extend through multiple medians due to parallel ramp movements. Under future background conditions, as part of the North Keating Channel Precinct Plan, the Cherry Street and Don Roadway intersections are expected to be reconfigured to accommodate pedestrian crossings on both sides, and additional controlled crossings are proposed at Trinity Street and Munition Street. Also, as part of the East Bayfront Precinct Plan and in conjunction with the extension of Queens Quay east of Parliament Street, the Lake Shore Boulevard / Parliament intersection will be reconfigured.

Table 3.4: Lake Shore Boulevard Pedestrian Crossings

Cross-Street	Pedestrian Crossing			
	Existing Conditions		Future Baseline Conditions	
	West Leg	East Leg	West Leg	East Leg
Yonge Street North intersection South intersection	 Permitted Permitted	 Permitted Permitted	 Permitted Permitted	 Permitted Permitted
Jarvis Street	Permitted; ramp crossing	Permitted	Permitted; ramp crossing	Permitted
Sherbourne Street	Permitted	Permitted;	Permitted	Permitted;
Parliament Street	Permitted	Not permitted	Permitted	Not permitted
Trinity Street	n/a	n/a	Permitted	Permitted
Cherry Street West intersection East intersection	Not permitted Not permitted	Not permitted Permitted	Permitted	Permitted
Munition Street	n/a	n/a	Permitted	Permitted
Don Roadway	Not permitted	Permitted	Permitted	Permitted
Carlaw Avenue	Permitted	Permitted	Permitted	Permitted

Table 3.5 lists the lengths of the crossings of Lake Shore Boulevard within the study area. Two lengths are listed: a curb-to-curb crossing distance, and that portion of the crossing distance that is "exposed to traffic" (i.e., after discounting the width of any medians long enough to be used as refuge islands during two-stage crossings). Future baseline changes between

Parliament Street and the Don Roadway (including new crossings at Trinity Street and Munition Street) are based on conceptual designs prepared for the *Keating Channel Precinct Plan*.

Table 3.5: Lake Shore Boulevard. North-South Crossing Distance

Crossing Location	Curb to curb crossing length *(m)*				Crossing Length Exposed To Traffic *(m)*			
	Existing		Future Baseline		Existing		Future Baseline	
	West Side	East Side	West Side	East Side	West Side	East Side	West Side	East Side
Jarvis Street	42.4	49.4	42.4	49.4	33.5	36.6	33.5	36.6
Sherbourne Street	48.0	49.5	48.0	49.5	33.5	35.9	33.5	35.9
Parliament Street	38.1	—	38.1	—	31.5	—	31.5	—
Trinity Street	—	—	30.3	30.3	—	—	24.3	24.3
Cherry Street	—	35.9	34.4	30.8	—	27.0	26.3	25.9
Munition Street	—	—	26.2	26.2	—	—	26.2	26.2
Don Roadway	—	26.4	—	26.4	—	17.9	—	17.9
Carlaw Avenue	29.7	31.1	29.7	31.1	26.4	24.3	26.4	24.3

Table 3.6 lists the number of lanes that pedestrians will need to cross at each intersection, including "mainline" lanes on Lake Shore Boulevard itself as well as right turn channelizations and any additional lanes related to on- or off-ramps. Future baseline conditions reflect the current concept plans developed for the Keating Channel Precinct.

Table 3.6: Number of Lanes Crossed by North-South Pedestrians

Intersecting Street	Number of Lanes On Lake Shore Boulevard Crossed By North-South Pedestrians*			
	Existing Conditions		Future Background Conditions	
	West Leg	East Leg	West Leg	East Leg
Jarvis Street	9	8	9	8
Sherbourne Street	8	8	8	8
Parliament Street	6	6	6	6
Trinity Street	N/A	N/A	6	6
Cherry Street	N/A	7	7	7
Munition Street	N/A	n/a	7	7
Don Roadway	N/A	6	4	6

**Includes right turn channelizations and parallel on- and off-ramp lanes.*

There are five locations within the Primary Study Area, listed in **Table 3.7**, where pedestrians cross uncontrolled channelized right turn movements along Lake Shore Boulevard. Three of these are at the west and east Cherry Street intersections; under future background conditions, these intersections are proposed to be replaced with a single consolidated intersection with no right turn channelizations.

Table 3.7: Pedestrian Crossings of Uncontrolled Right Turn Channelizations

Lake Shore Boulevard at:	Uncontrolled Right Turn Channelizations:	
	Existing Conditions:	Future Baseline Conditions:
Yonge Street	none	none
Jarvis Street	none	none
Sherbourne Street	** none	** none
Parliament Street	none	none
Trinity Street	[n/a]	none
Cherry Street West intersection East intersection	 WB right turn EB right turn; NB right turn*	 none
Munition Street	[n/a]	none
Don Roadway	NB right turn*	none
Carlaw Avenue	None	None
**uncontrolled 90-degree right turn*		

3.2.2.2 Cycling Facilities

Existing dedicated cycling facilities are illustrated in **Figure 3.15**. In addition to those dedicated facilities, cycling is also permitted and can be accommodated (with varying degrees of comfort) on all streets in the study area, with the exception of the Gardiner Expressway and Don Valley Parkway, on which cyclists and pedestrians are prohibited.

The following bicycle facilities currently provide connections beyond the study area:

- Martin Goodman Trail / Waterfront Trail (west of Yonge Street) – separated multi-use trail along Queens Quay;
- Yonge Street (bicycle lanes from Queens Quay to Front Street);
- Sherbourne Street (bicycle lanes from Queens Quay to Lake Shore Boulevard; cycle tracks north of Lake Shore Boulevard);

- Cherry Street: signed on-street bicycle north of the rail corridor; planned bicycle lanes to extend south of the rail corridor;
- Lower Don Trail – off-street multi-use trail along Don River;
- Logan Avenue – signed on-street bicycle route; contra-flow bicycle lane from north of Lake Shore Boulevard to Eastern Avenue;
- Martin Goodman Trail / Waterfront Trail – multi-use trail south of Queen Quay and through the Port Lands; and,
- Lake Shore Boulevard – multi-use trail on the north side connecting to the Waterfront Trail / Martin Goodman Trail at Leslie Street and the Lower Don Trail west of the Don Roadway.

The Martin Goodman Trail multi-use trail (which is identified as Toronto Bikeway Network Route 2 on City cycling maps) runs east-west along Queens Quay to west of the study area. Between Cherry Street and Parliament Street the Lake Shore Trail parallels Lake Shore Boulevard on its north side (a distance of approximately 0.60 km). The Martin Goodman Trail extends along the west side of Cherry Street, crossing over to the east side south of Commissioners Street where it continues to the outer harbour.

To the north of the Gardiner Expressway, between the rail corridor and Lake Shore Boulevard, there is a multi-use trail running from Cherry Street east to the Don River and splitting in two directions: one connecting north to a trail (Route 45) paralleling the Don River, the other continuing east of the Don River (Route 4) along the north side of Lake Shore Boulevard. Just east of the study area Eastern Avenue narrows to two lanes and has on-street bicycle lanes between Logan Avenue and Leslie Street. North-south cycling routes serving the study area include bike lanes/separated bikeway on Sherbourne Street and bicycle lanes on Cherry Street. Immediately east of Don Roadway, running north-south from Commissioners Street to Lake Shore Boulevard, an off-road trail is provided.

Future cycle/pedestrian facilities in the study area included:

- A bicycle route on an extension of Trinity Street south through the rail corridor, across Lake Shore Boulevard, and on a pedestrian / cycling bridge across the west end of the Keating Channel;
- New bicycle lanes along Cherry Street extending south from the recently built bicycle lanes in the West Don Lands, across the Keating Channel; and
- A new pedestrian / cycling bridge across the east end of the Keating Channel.

Figure 3.15: Existing Cycling Facilities

Figure 3.16: Existing Rail Facilities

3.2.3 Transit

Transit service in the study areas (primary and secondary) is provided by the Toronto Transit Commission (TTC) and GO Transit. Longer-distance trips to and from the primary study area are predominantly served by GO rail and bus services (focused on Union Station) and by the TTC subway network. While these facilities generally do not directly serve the primary study area, they serve a critical role in providing high-capacity transit access to and from the downtown area. In this way, they are analogous to the primary role of the Gardiner Expressway, which is to provide a major access to the downtown area.

Numerous rapid transit and regional transit projects have been identified by the TTC, GO Transit and Metrolinx as part of their respective long-term service plans. While many of these projects would not specifically travel through the study area, they will influence travel patterns at a regional level and may encourage an increase in transit ridership for trips bound to and from the downtown area. Specific to the study area, planned changes include:

- A new Light Rail Transit (LRT) line to run along the east side of Cherry Street from King Street south to the Ship Channel;
- The potential new GO Stations on the Lake Shore line in the area of the Don River;
- A new east-west Light Rail Transit (LRT) route along Queens Quay easterly to Cherry Street and extending into the Port Lands; and,
- A new LRT on the proposed Broadview Avenue Extension from south of Eastern to the Port Lands.

Other transit projects planned in the City that could influence travel demand in the corridor and have been accounted for in the regional demand forecasts:

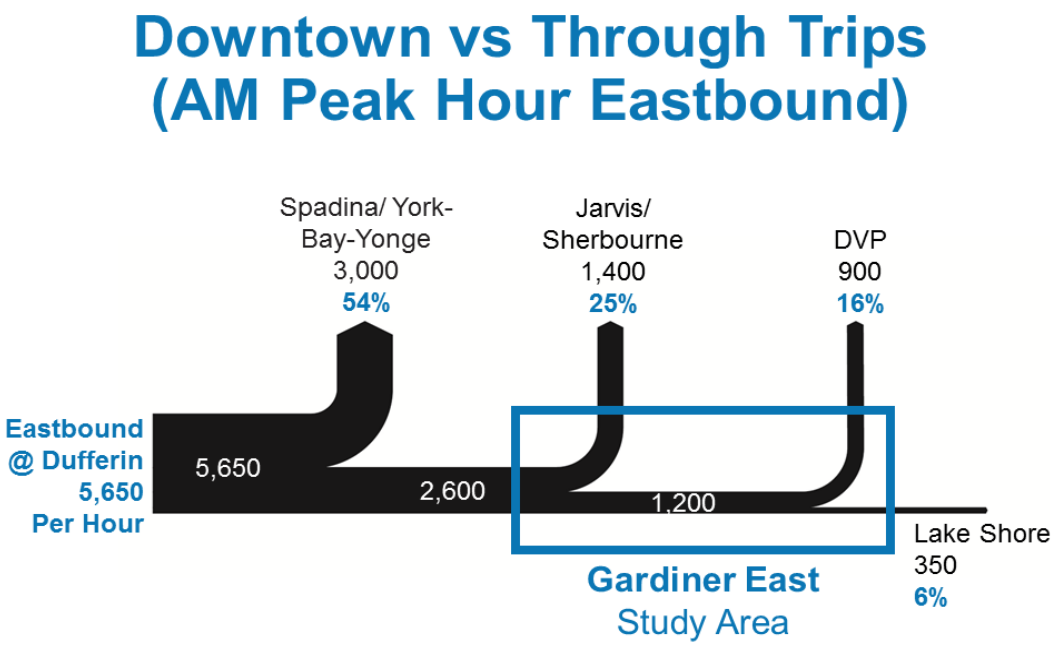
- Eglinton LRT (Mount Dennis to Kennedy Avenue);
- Yonge-University-Spadina Subway Extension to Vaughan Corporate Centre;
- Downtown Relief Line;
- GO Transit Regional Express Rail; and,
- Union Station Capacity Improvements.

3.2.4 Existing Travel Demand

The existing pattern of transportation demand for automobile infrastructure to, from, and within the study area places significant pressure on the surrounding infrastructure. The existing travel demands were quantified via the application of Bluetooth data capture methods that provided a consistent sampling of the amount and (local) origin/destination of vehicles travelling along the Gardiner Expressway, Don Valley Parkway, and Lake Shore Boulevard.

Figure 3.17 and **Figure 3.18** present the eastbound and westbound traffic volumes in the study area under the existing condition. **Figure 3.19** presents the breakdown of travel by mode approaching the study area. It can be seen that essentially 70% of all trips into the downtown are via transit, with only 28% via auto modes, and the remaining 4% via walking and cycling.

Figure 3.17: Existing Eastbound Traffic Volumes



Source: AM Peak Hour Survey Results (2010 Origin/ Destination Survey)

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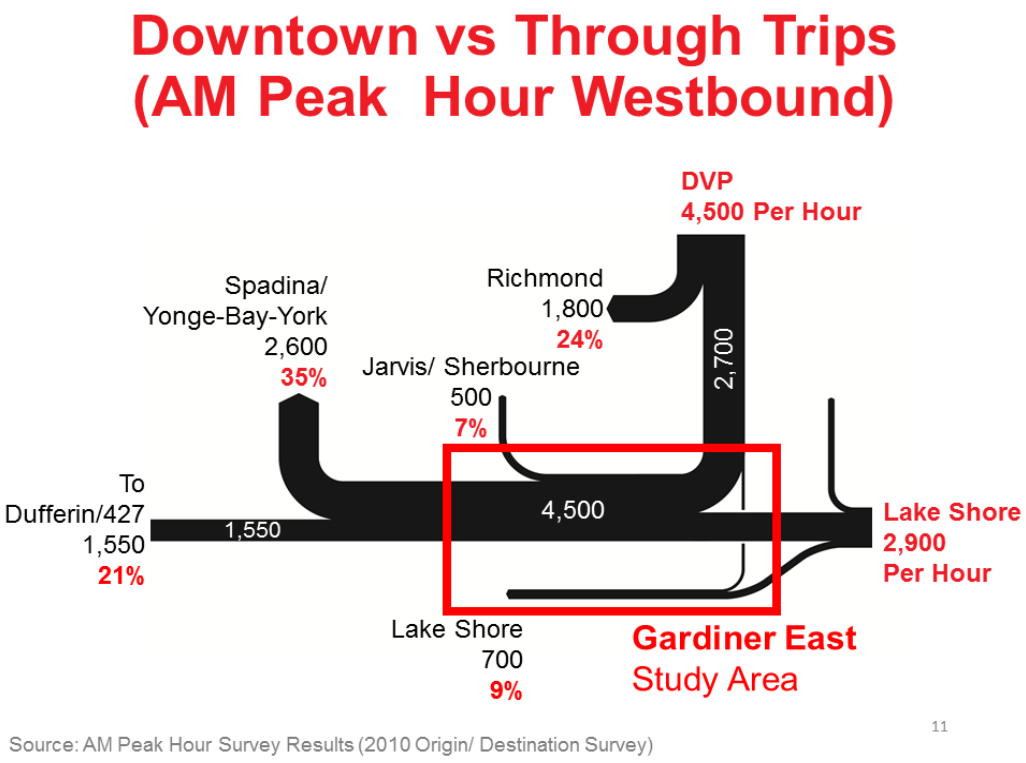
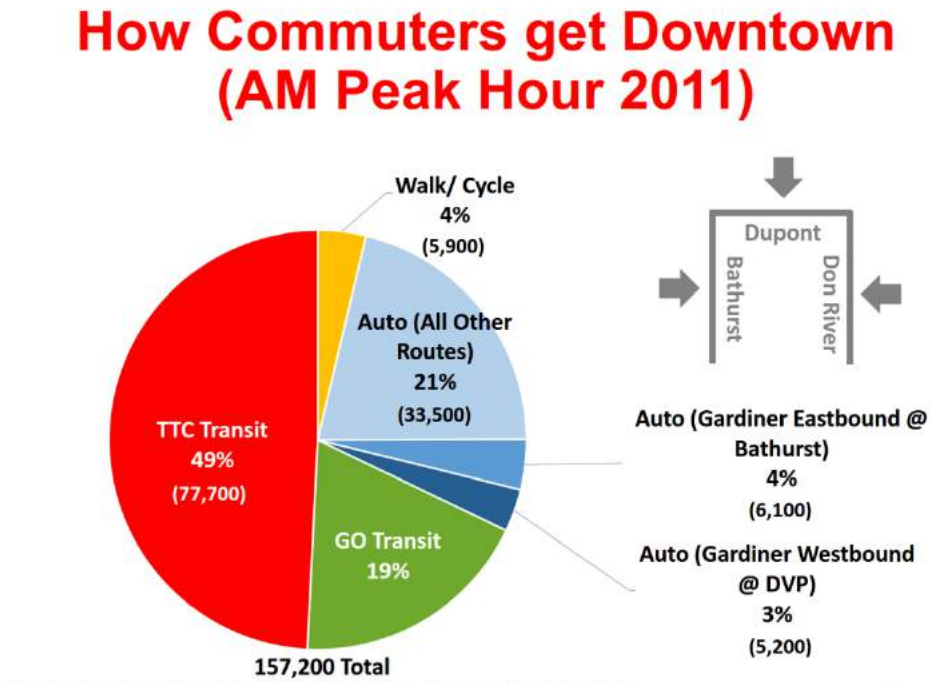
Figure 3.18: Existing Westbound Traffic Volumes



Source: AM Peak Hour Survey Results (2010 Origin/ Destination Survey)

Figure 3.19: Travel by Mode Approaching Study Area



Source: AM Peak Hour Inbound to Downtown: Transportation City Cordon Count (2011)
Downtown: Defined as Bathurst to Don River and Waterfront to the rail corridor north of Bloor

The following summarize a number of key observations made from the review of the available data on the use of transportation infrastructure in the study area.

1) The primary function of the Gardiner Expressway and Lake Shore Boulevard is to serve as an access route to and from downtown Toronto.

Origin-destination surveys undertaken in November 2009 found that, of all traffic approaching the central area from the west, northeast and east on the Gardiner Expressway, Don Valley Parkway and Lake Shore Boulevard during the AM peak period, 75% or more has a downtown destination. Less than 25% of traffic travels all the way past the downtown off-ramps.

2) Travel to downtown has been continuously increasing.

Growth in travel to downtown destinations increased by approximately 38% from 1986 to 2011, corresponding to a period of continued employment and residential growth. Most of the increase in inbound trips originated in the city itself (internal trips nearly doubling between 1986 and 2011) and in the growing suburban municipalities surrounding Toronto (more than doubling over that same period).

3) Peak hour, peak direction auto volumes have not increased substantially in 30 years.

While the total number of AM peak period trips to downtown destinations increased between 1986 and 2011, the number made by auto remained at approximately the same level. This reflects long-standing capacity limitations within the road network in and approaching downtown; with the main downtown approach routes operating at capacity through much of the peak period, there is limited potential to accommodate increased traffic to downtown. As a result, the proportion of downtown-destined trips made by auto has declined from a peak of 39% in 1996 to 27% in 2011 as travellers have found alternate methods of completing the trip via improved transit, cycling, and walking facilities.

4) Peak hour, peak direction travel growth has been accommodated primarily by other travel modes.

The majority of growth in travel to downtown has been on GO Transit (growth in travel from the suburban municipalities surrounding Toronto), on foot and by bike (growth in short-distance travel resulting from increased downtown residential development).

5) The number of people choosing to live and work downtown is increasing.

The past 10 to 15 years have seen a substantial increase in residential population in the downtown area. The population within the study area increased by 40% between 2001 and 2011; areas immediately outside the study area have also experienced substantial residential growth over this time.

The majority of residents living and working downtown travel to work on foot (47%), with a further 29% who commute via TTC. This has resulted in increased pressure on the downtown pedestrian and transit infrastructure, but has also helped to reduce the pressure of increased downtown employment on regional infrastructure into the downtown (the road and expressway network; the TTC; GO Transit).

6) The peak hour traffic volumes in the off-peak direction (i.e., outbound in the morning) continues to increase.

While the majority of downtown residents also work in the downtown, there is also a sizeable minority of downtown residents that travel to destinations in the rest of Toronto (32%), and in the municipalities outside Toronto (9%). These trips are not as well served by the transit network, and more than half of them are made by automobile. This has led to increased traffic and growing congestion in what has traditionally been the off-peak direction on the Gardiner Expressway and Don Valley Parkway. It also places increased pressure on the arterial network to serve travel in two directions, rather than simply optimizing traffic signals to accommodate the peak commuting direction.

7) The east section of the Gardiner Expressway is an important link from a vehicle traffic perspective, although it is less important from an overall travel demand perspective.

The east section of the Gardiner Expressway carries approximately 12% to 15% of all vehicles crossing the downtown cordon in the peak direction. When accounting for trips on all travel modes, it only serves 5% or less of all traffic entering downtown. This percentage would decrease further if also considering short-distance commuting trips by residents living and working downtown.

3.2.5 Future Travel Demand

Future travel demand/volume was determined through forecasts generated by the City of Toronto's regional transportation model. **Table 3.8** summarizes the number of automobile trips, transit (TTC and GO) trips, and "other" trips (predominantly walking and cycling) destined to, from, and within the study area for the 2001 and 2031 horizon years during the three-hour AM peak period. (For the purpose of this assessment, the study area boundary includes the larger downtown area previously described and used in the traffic microsimulation undertaken in the EA). For the 2031 horizon year, traffic demand forecasts assumed full build out of lands in the waterfront, including the Port Lands.

Overall, travel through and within the study area is expected to increase by 59% during the AM peak period in 2031. Automobile travel is expected to grow at a lower rate (31%) than transit travel (76%) and walking / cycling trips (87%).

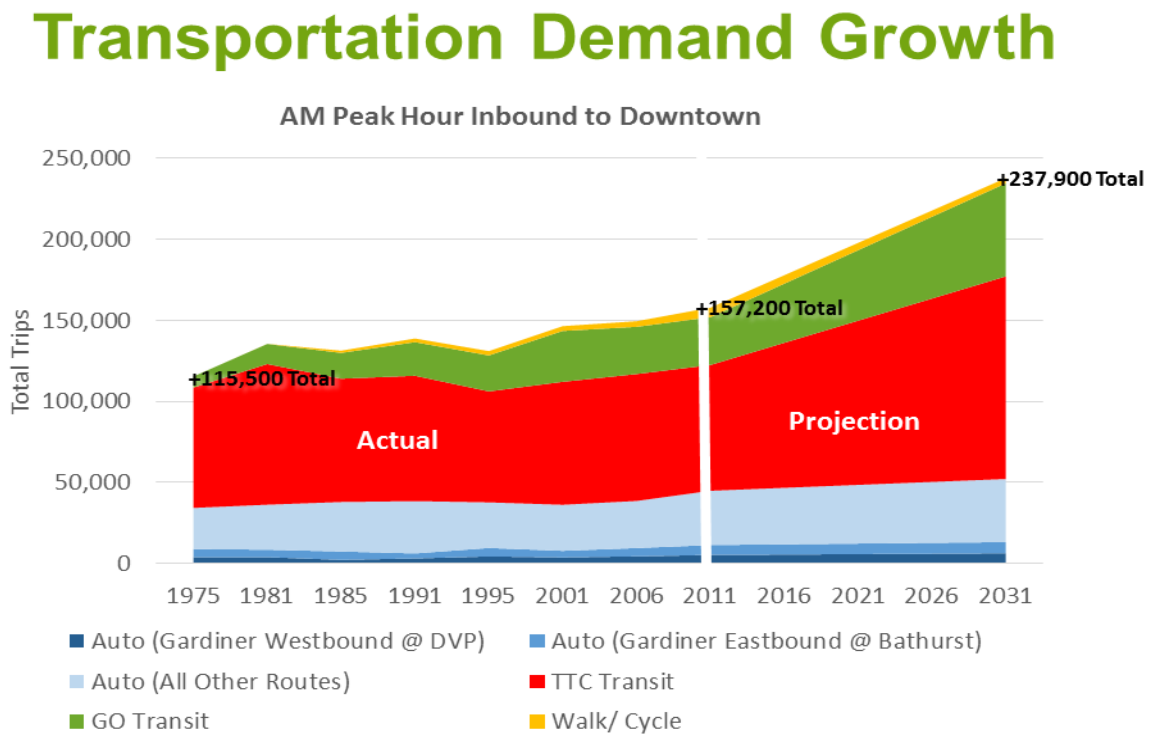
Table 3.8: Modeled Growth in Travel To / From Study Area, AM Peak Period

Primary Travel Mode	Modeled Values		30-Year Growth		Modeled Modal Split	
	2001	2031	Volume	%	2001	2031
From external to study area:						
Auto	66,100	72,200	6,100	9%	38%	29%
Transit	103,900	172,100	68,200	66%	59%	68%
Other	5,800	7,500	1,700	29%	3%	3%
Total	**175,800**	**251,800**	**76,000**	**43%**	**100%**	**100%**
Internal within study area:						
Auto	2,600	4,800	2,200	85%	33%	26%
Transit	2,600	6,200	3,600	138%	33%	34%
Other	2,800	7,400	4,600	164%	35%	40%
Total	**8,000**	**18,400**	**10,400**	**130%**	**100%**	**100%**
All trips destined to study area:						
Auto	68,700	77,100	8,400	12%	37%	29%
Transit	106,500	178,300	71,800	67%	58%	66%
Other	8,500	14,900	6,400	75%	5%	6%
Total	**183,700**	**270,300**	**86,600**	**47%**	**100%**	**100%**
From study area to external:						
Auto	14,800	32,600	17,800	120%	57%	52%
Transit	8,600	24,500	15,900	185%	33%	39%
Other	2,600	5,800	3,200	123%	10%	9%
Total	**26,000**	**62,900**	**36,900**	**142%**	**100%**	**100%**
All travel to, from and within study area:						
Auto	83,500	109,700	26,200	31%	40%	33%
Transit	115,100	202,800	87,700	76%	55%	61%
Other	11,100	20,800	9,700	87%	5%	6%
Total	**209,700**	**333,300**	**123,600**	**59%**	**100%**	**100%**

Source: City of Toronto, Regional Travel Demand Model Output

Figure 3.20 illustrates the changes in overall demand and by mode over time based on Transportation Tomorrow Survey data from 1975 to 2001, plus model forecasts to 2031.

Figure 3.20: Travel Demand Growth By Mode, 1975-2031



Source: AM Peak Hour Inbound to Downtown: 1) Transportation City Cordon Count (1975-2011); 2) Transportation Model EMME2 Forecast (2011-2031); 3) 2006 Transportation Tomorrow Survey (TTS) for Walk/Cycle Mode and Other Data; 13
Downtown: Defined as Bathurst to Don River and Waterfront to the rail corridor north of Bloor

Table 3.9 lists the modeled travel time to Union Station (Bay Street at Front Street) from selected external origins under existing and future baseline conditions assuming the Gardiner is in place as it is today. Travel time estimates were prepared for AM peak hour conditions, corresponding to the period assessed in the City's EMME model and used combined outputs from the City's EMME model and the Paramics model developed for this EA study. Is noted that the 2031 base case travel times are up to 6 minutes higher than current travel times due to growth in background traffic volumes.

Table 3.9: AM Peak Hour Travel Time to Downtown – Existing and Future

Origin	Destination	Travel Time *(minutes)*	
		Existing	2031
Existing Conditions:			
Victoria Park / Finch	Union Station	44	52
Don Mills / Eglinton	Union Station	24	30
Victoria Park / Kingston	Union Station	20	23
Kipling / Lake Shore	Union Station	27	27

Regarding future projected transit travel time, auto travel times were used as a proxy. While streetcar travel times would be longer, in part due to dwell time at stops and the inability to bypass left turn queues, it is assumed that alternatives that result in increase in auto travel times would result in a corresponding (or greater) impact on streetcar travel times.

Table 3.10 lists the average travel time for automobiles along Dundas Street, Queen Street and King Street through the extent of the study area, under 2031 baseline ("do nothing") conditions.

Table 3.10: Automobile Travel Times Along Key Streetcar Corridors, Future (2031) Baseline Conditions

Street	Extent	AM peak		PM peak	
		WB	EB	WB	EB
Queen Street	Spadina Avenue – Woodbine Avenue	15:44	15:13	16:24	16:40
Dundas Street	Spadina Avenue – Kingston Road	12:59	13:55	14:24	17:45
King Street	Spadina Avenue – Queen Street	8:57	7:46	9:47	10:08

3.2.6 Utilities

The study area contains numerous above and below ground utilities including hydro electric transmission lines and gas, water, storm sewer, and communications facilities. Key underground utilities buried under the Gardiner – Lake Shore Boulevard include the following:

- 500 mm Gas Main;
- Toronto Hydro Conduits;
- 300 mm Water Mains;
- Storm Sewers (various sizes);
- Sanitary Sewers (various sizes);
- 175 mm Cable Conduits; and
- Bell Conduits.

The City of Toronto has recently constructed the West Don Lands Stormwater Quality Facility which includes an underground sedimentation tank, deep shaft and pumping station with deep outfall tunnel located north of the Gardiner immediately east of Cherry Street. The outfall discharges into the Keating Channel. Future components associated with this facility include further treatment (clarifier, UV) and support building.

3.2.7 River and Harbour Infrastructure

TRCA, in cooperation with Waterfront Toronto and the City, completed an Individual EA for the mouth of the Don River and larger Port Lands referred to as the DMNP EA. The study addressed lands encompassing approximately 290 hectares of urban land east and south of the Don River that is subject to risk of flooding. Recommendations from the DMNP EA will transform the existing mouth of the Don River including the Keating Channel, into a more naturalized river outlet to Lake Ontario. The DMNP EA was approved by the MOECC in January 2015. The conceptual design for the DMNP includes a new river valley system that flows south and then west into the Inner Harbour, with an approximate location halfway between the Ship Channel and the Keating Channel.

Based on the results of the DMNP EA, a new Don River width will be required at Lake Shore Boulevard involving a multi-span bridge (3 new spans in addition to the existing 2 spans) and associated, integral weir configuration. North of Lake Shore Boulevard the future Don River will be considerably wider than it is today with the introduction of river sedimentation control and debris management facilities, including an operations and maintenance yard.

3.3 Urban Design

The Urban Design study lens is used to describe the planning framework, urban design and public realm, and socioeconomic conditions of the potentially affected environment. This description of baseline conditions considered a slightly larger study area, extending all the way to Yonge Street in the west and Leslie Street in the east, to provide context for planning and urban design.

3.3.1 Planning Context

At a high level, the planning context for the study area is set by the Province through the *Planning Act*, the *Provincial Policy Statement*, and the *Growth Plan for the Greater Golden Horseshoe*. Based on land use policies from both the *City of Toronto Official Plan* (2006) and the *Former City of Toronto Official Plan*, the existing urban structure of the Study Area is shown in **Figure 3.21**. The study area includes lands designated for neighbourhood uses, as well as for Employment Areas, Regeneration Areas, natural areas, and parks.

With changes to commercial activity in the city, the majority of historic industrial development along the waterfront no longer serves its original purpose and many sites in the study area are underutilized brownfields. Toronto is focusing on revitalizing its waterfront to include a mix of commercial and residential development, cultural and institutional amenities, and signature public spaces. There are some industrial uses that will continue in the study area related to the port, including Redpath Sugar and LaFarge. The compatible operation of productive industrial uses associated with the port will continue to be supported as important employment uses.

The study area is also subject to the *Central Waterfront Secondary Plan* (CWSP) (2003) which guides land use and urban design within the study area. The CWSP was prepared under the former City of Toronto Official Plan and is a guiding policy document for waterfront revitalization. The full extents of the CWSP are shown in **Figure 3.22**.

Figure 3.21: Official Plan Urban Structure Designations

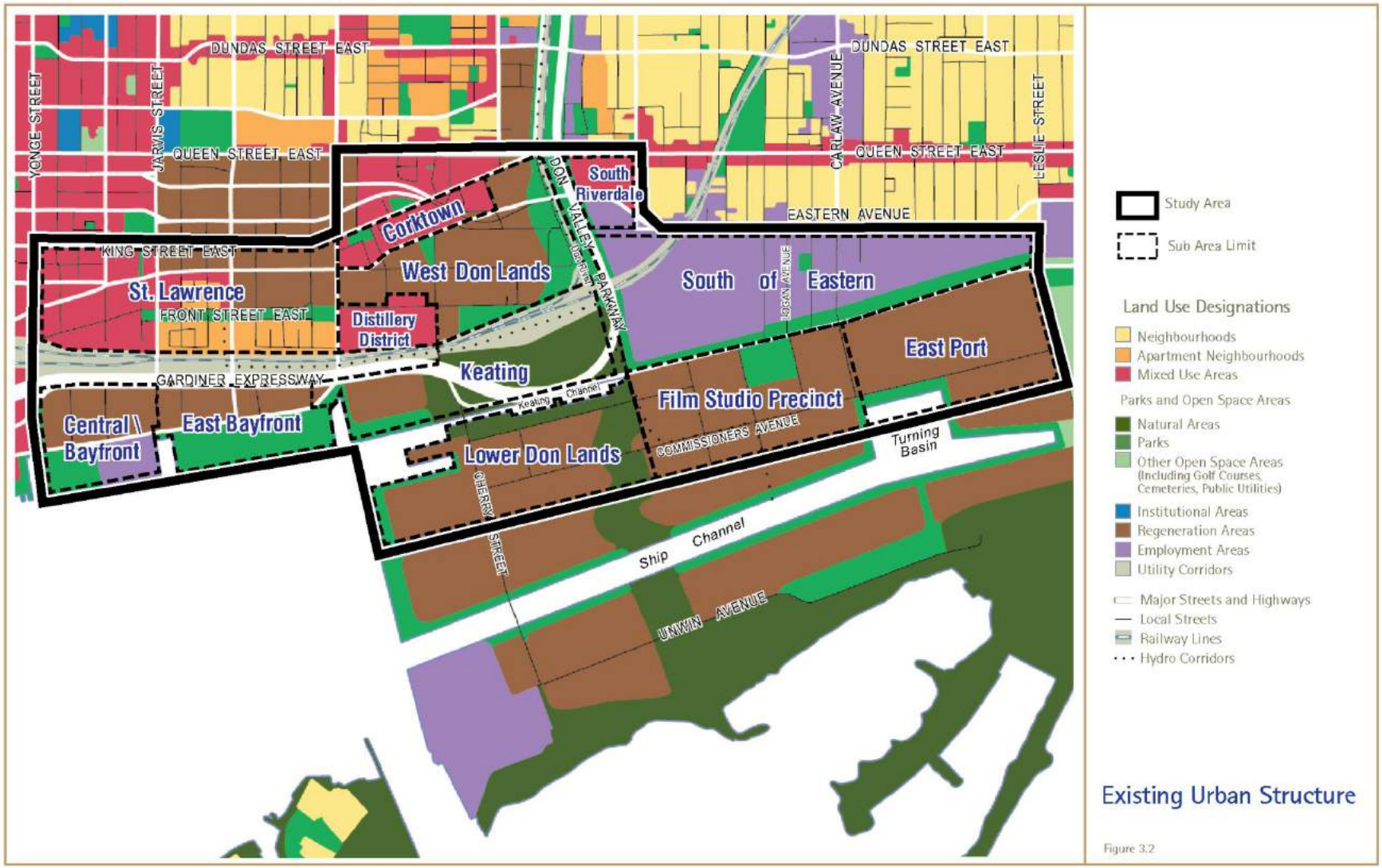
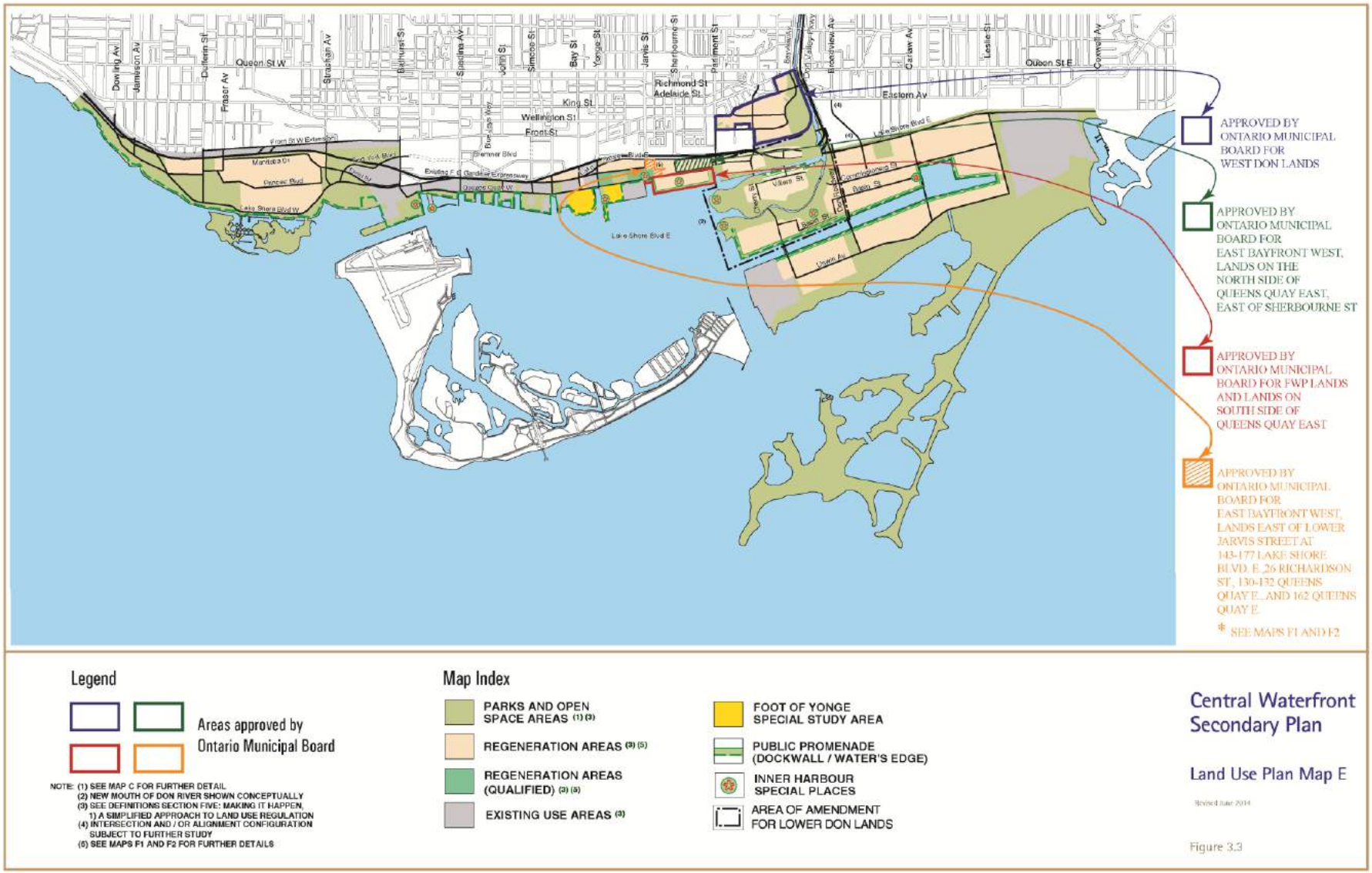


Figure 3.22: Central Waterfront Secondary Plan – Land Use



The CWSP is a strategy for waterfront renewal is built on four core principles:

A. Removing Barriers/Making Connections
B. Building a Network of Spectacular Waterfront Parks and Open Spaces
C. Promoting a Clean and Green Environment
D. Creating Dynamic and Diverse New Communities

The CWSP designates the central waterfront lands as Regeneration Areas. A broad mix of commercial, residential, industrial, parks and open space, and institutional uses are permitted in Regeneration Areas. The CWSP requires high quality design on development sites adjacent to the water's edge promenade, that views of the water be protected, and that buildings be of low to moderate scale. The CWSP anticipates over 40,000 new dwelling units, approximately 68,000 people, and over 900,000 square metres of commercial uses to be developed in the area.

As part of the planning framework the study area is also subject to Urban Design Guidelines developed by the City. The study area is subject to District or Area-based Guidelines as well as City-wide and Building Specific Guidelines. There are City-wide guidelines for: infill townhouses; mid-rise buildings; tall buildings; streetscape; 'greening' of surface parking lots; drive-through facilities; bicycle parking facilities; universal accessibility; green roofs; and bird-friendly development. The tall building and mid-rise design guidelines, in particular, apply to the study area. All of the mentioned City guidelines have informed the EA and some will be become more prevalent as the undertaking progresses beyond the EA and into detailed design and implementation.

To guide the EA study, a review of the City of Toronto Official Plan (OP) was completed and the results provided seven themes that were considered in the development, design and evaluation of alternatives in order to achieve alignment with the OP:

1. Impacts of the alternatives locally and in a regional context;
2. How the alternatives function as part of an integrated system of land use patterns and transportation networks that together support growth in Toronto;
3. Impacts of alternatives on the natural environment and the potential contributions of the alternatives to sustainability;
4. The potential of alternatives to unlock and implement opportunities to expand and improve the public realm;
5. Impacts on employment and economic competitiveness for the city as a whole and for the study area;
6. The contribution that alternatives can make to the success of the downtown; and
7. Alignment of alternatives with Toronto's waterfront revitalization.

3.3.2 Urban Design & Public Realm

Urban design and public realm conditions in the study area have been identified based on existing community conditions, and precinct and area planning studies that exist, or are in progress, for specific sub-areas. Within the study area there are three endorsed Precinct Plans and two emerging Precinct Plans that informed the EA study. These include:

- Precinct Plans that are approved and are in the process of detailed design, implementation and, in some cases, are constructed, include:
  - West Don Lands Precinct Plan;
  - East Bayfront Precinct Plan; and,
  - Keating Channel Precinct Plan (the implementation of this Precinct Plan is on hold pending the results of this EA).

- Precinct Plans that are in progress include:
  - Lower Yonge Precinct Plan; and,
  - Villiers Island Precinct Plan (which is the first detailed precinct plan to be undertaken to further the Lower Don Lands plans).

Precinct plans articulate the planned public realm and form of development for an area. In addition to the precinct plans noted, the City and Waterfront Toronto are also completing land use and public realm studies for the redevelopment of the Port Lands and South of Eastern sub-areas located east of the Don Roadway.

Figure 3.23 indicates the areas included in these precinct plans and planning studies.

Figure 3.23: Precinct Plan and Planning Study Areas

The long and storied past of the study area introduced in **Section 3.1.1** (Cultural Heritage and Archaeological Resources) also contributed to an extensive history and evolution of the existing public realm. The existing large-grained street and block pattern, shown in **Figure 3.24**, within the study area reveals the industrial past.

The existing urban design and public realm conditions vary between those communities north of the rail corridor and those to the south. North of the rail corridor are some of the city's historic neighbourhoods that have a fine grain road network, public amenity space, and good pedestrian connections. These include the communities of St. Lawrence, the Distillery District and Corktown. North of the rail corridor also includes the West Don Lands Precinct which has been redeveloped as per the Precinct Plan into a complete community that is walkable and abundant with public space, including Corktown Common park.

South of the rail corridor the existing public realm and urban design conditions reflect more of the industrial history of the waterfront. These areas are primarily auto-oriented with large block patterns, limited public space and minimal pedestrian connections. However, this is evolving and in some cases, such as for the East Bayfront and along the water's edge, the existing condition is transforming into a more pedestrian oriented environment. A significant portion of the public realm improvements identified in the East Bayfront Precinct Plan have been implemented. Improvements include new public amenity space, more fine grain street network, improved view corridors to the waterfront, a publicly accessible water's edge promenade, and streetscaping which are all incorporated into the existing condition.

Connectivity is a key element of urban design and public realm design. As described above, existing connections are limited by the existing block patterns and infrastructure in the study area. Again, south of the rail corridor there are more limited connections than to the north. Existing east-west connectivity is shown in **Figure 3.25**, and north-south connectivity is shown in **Figure 3.26**.

Figure 3.24: Existing Block Structure for Study Area

Figure 3.25: East-West Connectivity

Figure 3.26: North-South Connectivity

Although the overall existing conditions are not favourable for urban design and public realm, the future conditions are a different case entirely. The waterfront communities in the study area are undergoing transformation based on the precinct plans and ongoing planning studies identified earlier. As such, the existing large block structures are going to be redesigned, new connections are going to emerge and additional public space is going to take shape. This is particularly true for the Lower Yonge Precinct, Keating Channel Precinct, Lower Don Lands and Villiers Island Precinct, Port Lands and South of Eastern areas. At this time the exact block plans and fine grained road network for these areas is still being confirmed and refined. However, an understanding of general improvements and how the urban design and public realm in the study area will evolve can be provided to inform the future (2031) conditions.

The demonstrated future (2031) block structure for the study area is shown in **Figure 3.27.** The future conditions in the study area will reflect new smaller blocks to support mixed-use redevelopment and walkable communities. There will also be significant improvements to public space for parks, plazas, pedestrian promenades and market space. Improvements planned throughout the study area will also transform connections for all modes of transportation and provide more connected communities. For Villiers Island, the Port Lands and South of Eastern area, and the Lower Yonge Precinct, additional improvements and changes to the block structure and public realm are anticipated far beyond what is illustrated in Figure 3.27. However, these plans are all in progress. Due to the confluence of planning projects underway in the study area that are occurring simultaneously, it is acknowledged that the Gardiner East design will need to consider the directions of these other studies and make efforts to compliment the urban design and public realm directions throughout the study area as plans are confirmed. Further information regarding future precinct development, block patterns and land use is provided in the following Section 3.3.2 Land Use and Social Environment.

Figure 3.27: Future Block Structure for Study Area (2031)

The urban design and public realm analysis illustrates that existing planning efforts have identified initiatives to improve the public realm in the study area. The Gardiner East EA may advance planning for improvements to public realm elements in the study area, including:

- Improvements to north-south connections at Lower Jarvis, Lower Sherbourne, Parliament, Cherry and Trinity Streets to improve pedestrian conditions and create stronger connections from the city to the waterfront;
- Improvements in the Keating Channel Precinct where there is the greatest potential for changes to Gardiner Expressway infrastructure to transform the precinct;
- Identification of opportunities to extend Broadview Avenue south from Eastern Avenue to Lake Shore Boulevard East;
- Defining opportunities for improved crossings across the Don River and the Keating Channel;
- Providing pedestrian and cycling connections east-west and north-south throughout the study area; and,
- The overall creation of context to further articulate implementation of CWSP policies.

The reconfiguration of the Gardiner Expressway and Lake Shore Boulevard East will play an important role in connecting and enhancing the communities in the study area and providing new opportunities for public realm and urban design improvements.

3.3.3 Land Use & Social Environment

This section focuses on the existing (what is currently on the ground) and future (what is approved for future development) land uses in the study area, particularly those adjacent to the Gardiner Expressway and Lake Shore Boulevard corridor. In addition to land use, a discussion of the social environment including community infrastructure and facilities is provided. Economic conditions are described in this report under **Section 3.4 Economics.**

The 2013 baseline conditions reflect a 2011 Census population of approximately 12,000 people in the study area. Considering how close the study area is to the downtown core, this reflects how sparsely developed/populated the corridor is. The majority of this population is located north of the Union Rail Corridor and north of Lake Shore Boulevard. Much of the lands immediately adjacent to the Gardiner Expressway corridor are either vacant, underutilized, or in transition.

Figures 3.28, 3.29, 3.30, 3.31, 3.32 illustrate existing and planned land uses and infrastructure facilities immediately along the Gardiner – Lake Shore Boulevard corridor (area outlined in white) as of 2013. The exact extents of the planned facilities (such as the Don Mouth Sediment Management Facility) may vary from what is indicated on these figures as the plans for these features evolve with detailed design and implementation.

Further description of existing and future land use within the study area surrounding the Gardiner – Lake Shore Boulevard corridor is provided below.

Figure 3.28: Existing Land Uses Along Corridor

Figure 3.29: Existing Land Uses Along Corridor

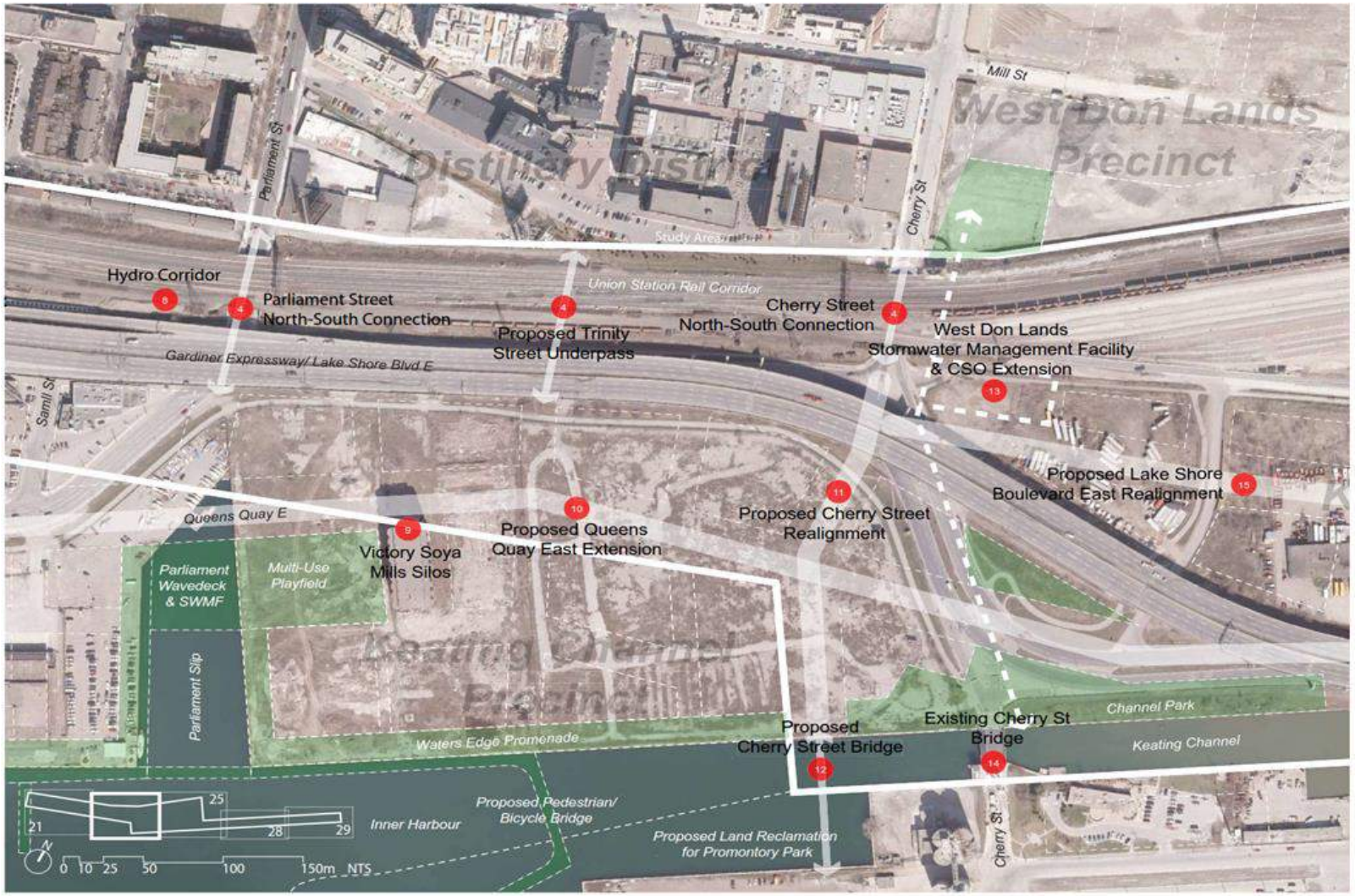


Figure 3.30: Existing Land Uses Along Corridor

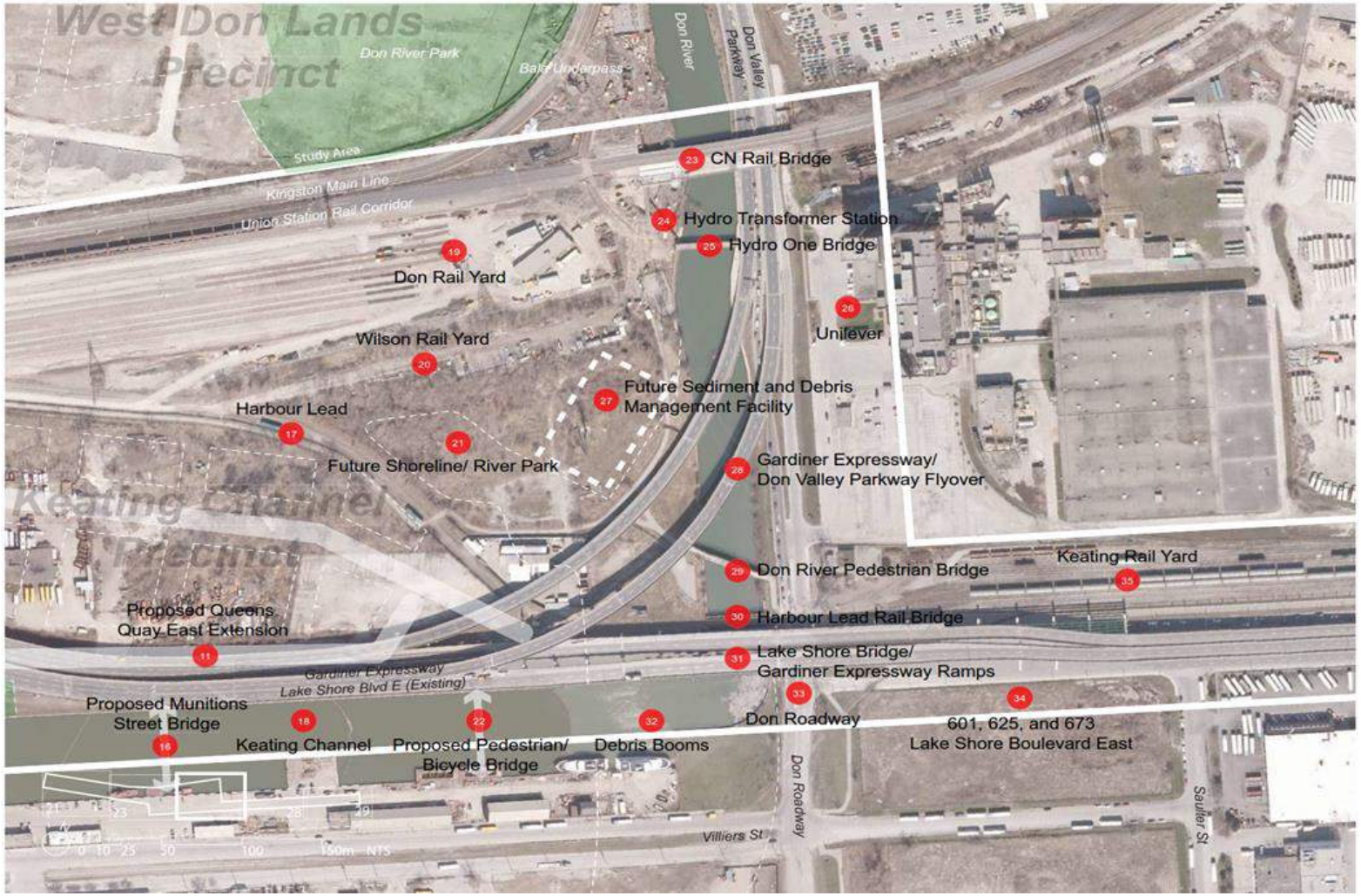


Figure 3.31: Existing Land Uses Along Corridor

Figure 3.32: Existing Land Uses Along Corridor

For the portion of the study area west of the Don Roadway / DVP, the north side of the Gardiner Expressway is adjacent to the Union Station Rail corridor which limits existing uses on the north side of the Expressway and Lake Shore Boulevard. North of the rail corridor there are a mixed of well-established uses that have evolved with the growth of the downtown. These include residential, commercial/retail, recreational and office space. Previous industrial uses in the Distillery District and West Don Lands have been converted to mixed use communities with residential, recreational, commercial/retail and office uses. These communities north of the rail corridor also include established social infrastructure, including schools, social housing, daycares, and community recreation and gathering spaces.

On the south side of the Gardiner Expressway and Lake Shore Boulevard the existing land uses primarily consist of underutilized low density employment, industrial and commercial uses. There are also a number of large surface parking lots that are considered underutilized. Of the communities within the study area south of Lake Shore Boulevard, East Bayfront is the most rapidly changing precinct. The East Bayfront Precinct transition has been ongoing during the time of this EA. As such, some of the growth and change in East Bayfront is described as an existing condition and some is described in the future (2031) conditions. Related to existing conditions, there are a number of new tourism and recreation areas that have been established in East Bayfront and that are increasing in popularity. These include Canada's Sugar Beach, Sherbourne Common, the Water's Edge Promenade and associated commercial uses in new office and institutional buildings. New office and institutional uses that exist now include the George Brown College campus and Corus Quay buildings. There are also newly built residential buildings that have been occupied as the EA evolved. All of the development that has been completed in East Bayfront supports recent population and employment growth in the study area.

The Lower Yonge Precinct currently consists of employment and industrial and commercial uses. This area is currently faced with pressure for new development and is being planned to transform with significant population and employment growth. This is further described in future conditions below.

The Keating Channel Precinct is currently underutilized and contains no active land uses that support population or employment. The historic Victoria Soy Mills are located here but they are not in use. The existing uses in the Lower Don Lands and the Port Lands are industrial, commercial and office uses, many of which are in transition. Many of the existing uses relate to the port and rely on connections to transportation and goods movement infrastructure. Most of the properties are large scale with uses that include surface parking and/or outdoor storage areas. Due to the current conditions in the Lower Don Lands, Keating Channel Precinct and the

Port Lands, these areas do not include significant recreation, tourism or social infrastructure. Further south of the study area, along the edge of Lake Ontario there are more established recreational and natural areas.

East of the DVP and north of Lake Shore Boulevard is the South of Eastern area. Existing uses in this area reflect the large scale industrial and commercial uses, many of which are also in transition. The South of Eastern area has a long history as the former film studios neighbourhood in the city. As the major film studio uses relocate, some into the Port Lands, this area is being planned for redevelopment. In addition, the former Unilever manufacturing site, which is located on the north-east corner of Lake Shore Boulevard and Don Roadway, is currently in the planning process for redevelopment into a major employment area by First Gulf. The South of Eastern area also contains some small pockets of residential uses as well as some big box retail. Together, the existing uses in the South of Eastern area are varied and inconsistent. The planning studies underway to transform this area will provide a more cohesive community character and are further discussed in future conditions below.

For the future (2031) land use and social environment conditions in the study area, data and analysis was taken from approved and proposed precinct plans, and development plans in the area. The study area land use and social conditions will change significantly by 2031. This is primarily due to waterfront redevelopment with the completion of West Don Lands and East Bayfront and the commencement and complete redevelopment of Lower Yonge Precinct, Keating Channel Precinct, Lower Don Lands, Port Lands and South of Eastern area. By 2031, the West Don Lands, East Bayfront and Keating Channel precincts are expected to be redeveloped and revitalized to accommodate nearly 50,000 new residents. Some of these residents are now in place in the West Don Lands and East Bayfront. The residential uses proposed include medium and high density development ranging from townhouses to mid-rise and some high-rise condominium units. The redevelopment of these areas will also include new employment uses which are further discussed in **Section 3.4 Economics.**

To support the future mixed-use communities along the waterfront, there will be additional commercial/retail, recreational and community uses developed. The social infrastructure patterns in the study area will alter to reflect the changes in the precincts as they evolve. As the population grows to 2031 and beyond, there will be additional social infrastructure facilities developed, including schools, libraries, daycares, community recreation and gathering spaces.

Critical to the success of the future communities in the study area is the improvement of public realm including recreational spaces and natural environment enhancements. As the study area lacks a consistent public realm and contains a degraded natural environment today, the future

conditions will implement great improvements to these uses and spaces. Planned public realm and recreational improvements expected to be in place by 2031 include:

- Naturalization of the mouth of the Don River, which will provide new green space and flood protection for the Lower Don Lands, Port Lands and South of Eastern area;
- The development of the waterfront promenade and park space at the Yonge, Jarvis and Parliament Street Slips;
- The development of a continuous waterfront promenade;
- A community facility at Sherbourne Common;
- The reconfiguration of Queens Quay;
- Cycling route along Cherry Street;
- Further improvements to the Martin Goodman trail through the area and eastward along Commissioners Street for multi-use bicycle and pedestrian activity; and,
- Spaces and corridors that will connect the Lower Don Lands (including Villiers Island), Port Lands, and the Keating Channel Precinct with the broader city.

The following paragraphs provide specific information on each precinct in the study area related to the anticipated 2031 condition as it was known at the time of this EA.

Figure 3.33 illustrates the long term plan for East Bayfront. The long term development of the East Bayfront Precinct includes 6,300 new residential units, including 1,200 affordable residences, 5.5 hectares of parks and public spaces and 1 kilometre of continuous water's edge promenade. As mentioned, much of this has already been built and will entirely be in place before 2031.

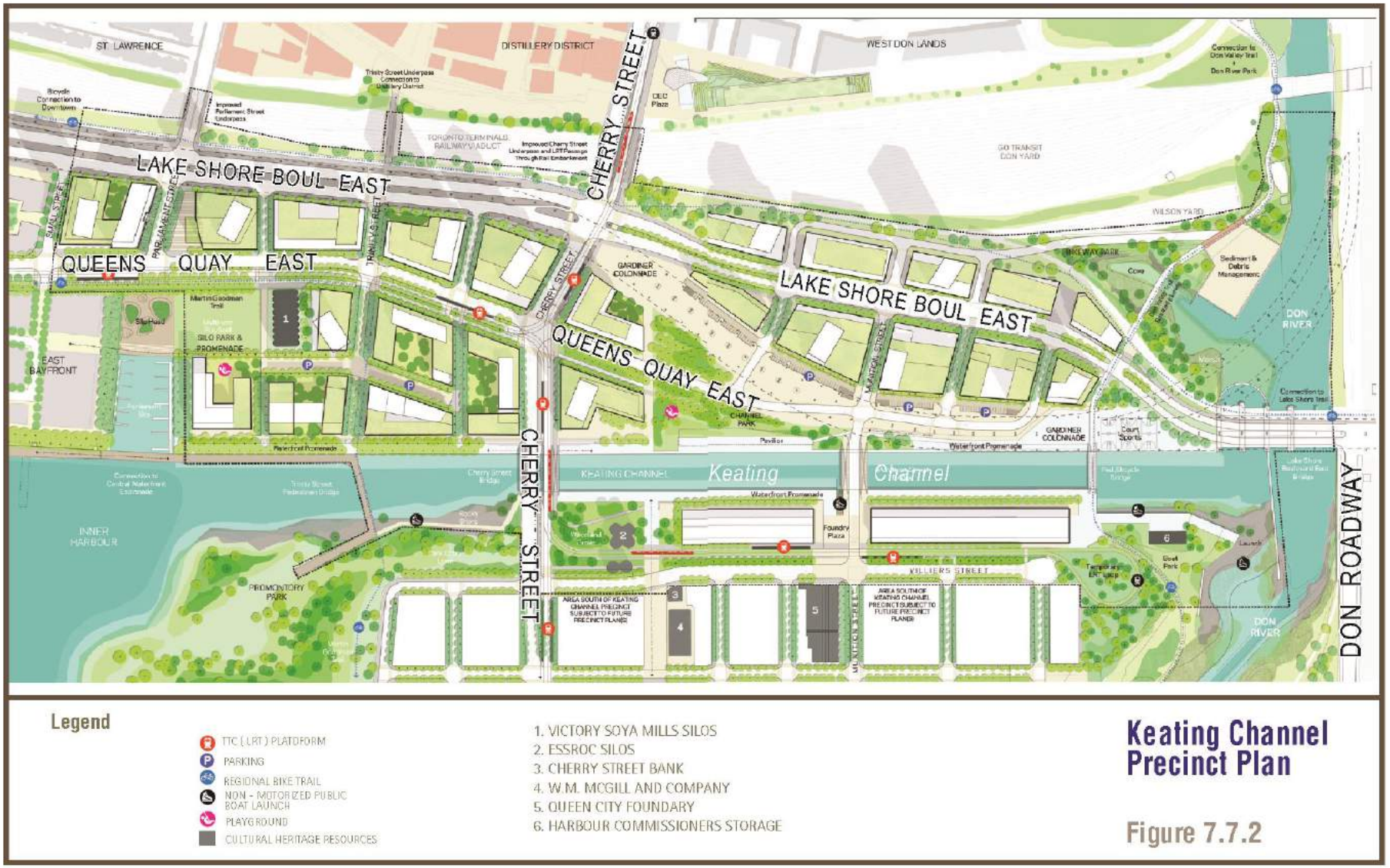
Figure 3.33: East Bayfront Precinct Plan

The Keating Channel Precinct is expected to undergo significant redevelopment in combination with the Lower Don Lands. The Keating Channel Precinct Plan is based on the assumption that the elevated Gardiner Expressway structure that traverses the precinct will remain in place, but also allows for the plan to be modified with potential reconfigurations to the Gardiner Expressway and Lake Shore Boulevard East. The Plan anticipates the retention of Victory Soya Mills silos and the ESSROC silos, and their integration into future developments. **Figure 3.34** illustrates the Keating Channel Precinct Plan done in 2010 which is to be updated to reflect the preferred undertaking identified through this EA process.

There are approximately 4,000 new residential units anticipated in Keating and the creation of approximately 2 kilometres of new waterfront open space. This will include enhanced connections to the waterfront with integrated streets and blocks, with barriers removed wherever possible. The plans include the realignment of Lake Shore Boulevard East further north through the precinct so as to free up new public realm space along the north edge of the Keating Channel.

Such improvements will activate the areas both north and south of the Keating Channel with a mix of recreational, commercial and residential uses, which may require further social infrastructure once the area is built out. The future 2031 conditions include at-grade retail along Queens Quay East, Lake Shore Boulevard East and Cherry Street to bring life and vibrancy to the local streets.

Figure 3.34: Keating Channel Precinct Plan



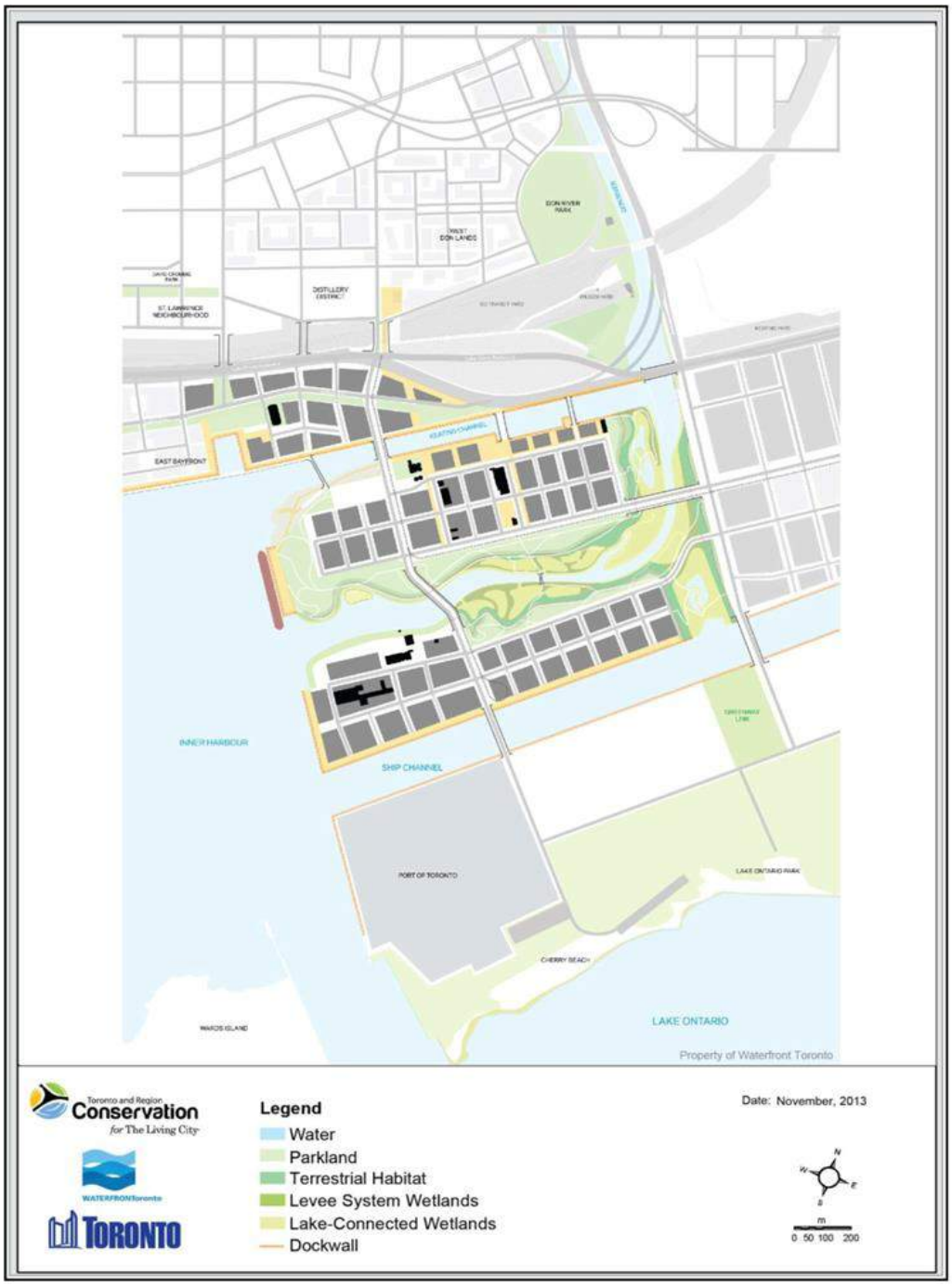
On the south side of the Keating Channel is the Lower Don Lands Precinct. This area has been approved for significant redevelopment based on the DMNP EA and the Lower Don Lands EA (plans illustrated in **Figure 3.35**). These EAs provide the foundations for the revitalization of the Lower Don Lands. The DMNP EA will provide the flood protection needed to make development of the Lower Don Lands, Port Lands and South of Eastern areas possible. Further information regarding the DMNP EA is provided in Section 3.1.4 Stormwater Management.

The Lower Don Lands future development plan includes an area that covers125 hectares (308 acres). The future conditions will include over 12,000 new residential units and approximately 3,000,000 sq. ft. of commercial and retail space. With the realignment of the mouth of the Don River, there will also 30 hectares of naturalized area as well as over 12 hectares of parkland above top of bank outside of the new river valley system. This parkland is intended to accommodate passive and active recreational uses such as sports fields, event spaces, lawns, playgrounds, public gardens and other park program components as may be appropriate. Details regarding the development of the Lower Don Lands will evolve through precinct plans of specific areas within the Lower Don Lands. The first area to have a precinct plan completed for it is Villiers Island (also known as Cousins Quay). This is the area located on the south side of the Keating Channel, west of the Don Roadway. The Villiers Island Precinct Plan commenced during the time of this EA and is ongoing. The Precinct Plan will identify:

- Streets and block structure;
- Height and massing of buildings;
- Provision of parking;
- Strategies to balance residential and employment-based development;
- Affordable housing targets;
- Location of local and regional parks and community facilities;
- Sustainable development measures;
- Provisions to retain heritage building;
- Public art and urban design guidelines; and,
- Active, vehicular and transit routes.

The Gardiner East EA takes into consideration the dramatic changes being proposed for Villiers Island and the remainder of the Lower Don Lands. Recognizing that these plans are still evolving, consideration of changes to the Gardiner – Lake Shore Boulevard corridor will coordinate with land use and development changes proposed in the surrounding precincts.

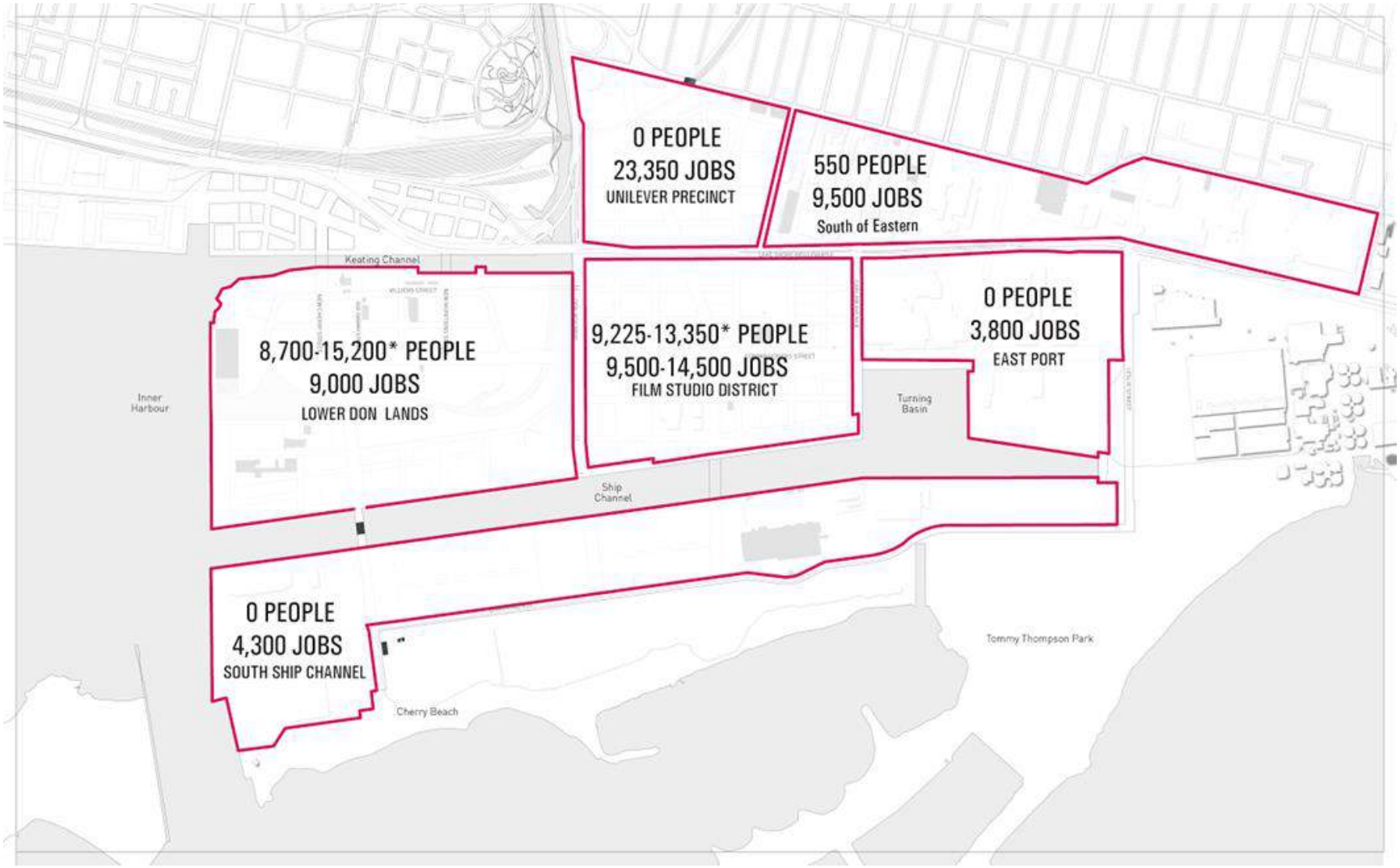
Figure 3.35: Preferred Concept for Don Mouth Naturalization and Lower Don Lands Plan



In addition to the Lower Don Lands, areas that also will be changing dramatically include the Port Lands and South of Eastern. The Port Lands are an important urban design, public realm, and socio-economic consideration for the study area and are currently under study in the Port Lands and South of Eastern TSMP and the Port Lands Planning Framework. The City's OP and the CWSP designate the majority of the Port Lands as Regeneration Areas. The CWSP envisions that the Port Lands will transform into a series of new urban districts and neighbourhoods amid the "hustle and bustle" of ongoing port activities. Revitalization of the Port Lands requires significant investment for soil remediation, new streets, transit and servicing.

With the flood protection planning in place as planned through the DMNP EA, the Port Lands and South of Eastern TSMP and the Port Lands Planning Framework build on the plans for the DMNP and Lower Don Lands. The future conditions of this area include a dramatic increase in population and employment. **Figure 3.36** illustrates the long term planned population and employment for these areas. With the increased population and employment, revitalization of these areas will include improvements for new and reconstructed public streets that will be designed to serve pedestrians, cyclists, transit and vehicles. Future plans will also provide space for public utilities and services, trees and landscaping, building access, and identify new public gathering places. Social community amenities will include new community facilities and school(s). Further information regarding the ongoing planning and design effort for the Port Lands and South of Eastern area can be found at http://www.portlandsconsultation.ca/.

Figure 3.36: Future Population and Employment in the Port Lands and South of Eastern



Finally, an area in which dramatic differences will be experienced in future land use and population includes the Lower Yonge Precinct. At the time of this EA study a Precinct Plan was commenced. Details of the final recommendations for future land use of social environment conditions are still in development. It is known that significant residential development is being considered that will transform this area from primarily employment uses to increased residential. Potential changes to the Gardiner – Lake Shore Boulevard corridor will consider the future conditions in the Lower Yonge Precinct as those conditions are confirmed and as the Gardiner East Project evolves from the EA through to more detailed design. Alternatives considered in the EA have been sensitive to the need to be adaptable given future study area conditions that are still in the planning stages.

Relevant to all precincts and future conditions understanding, a discussion of the future (2031) conditions and improvements to the connections for all modes of transportation throughout the study area is provided in **Section 3.2 Infrastructure and Transportation**.

With all of this waterfront revitalization, from Lower Yonge through the Port Lands and South of Eastern area, the future conditions will experience a great increase in local, regional, national and international tourism activity. As the waterfront is built out with quality urban design, public realm, and recreational areas, visitors will increase. Cultural events, festivals, markets and meetings may occur in the public open spaces and event spaces, supporting additional tourism activity. A discussion of the economic impacts of the waterfront redevelopment and tourism that may result is provided in **Section 3.4 Economics**.

The future baseline conditions in the study area in terms of urban design, public realm, land use and the social environment are vastly different than the existing baseline conditions due to the nature of the study area and the planning efforts underway to transform the central waterfront. Plans for Lower Yonge, East Bayfront, Keating Channel, Don River mouth, Lower Don Lands (including Villiers Island) and the Port Lands and South of Eastern reflect a major transition for the area which has the potential to be complemented through reconfiguration of the Gardiner Expressway and Lake Shore Boulevard East.

3.4 Economics

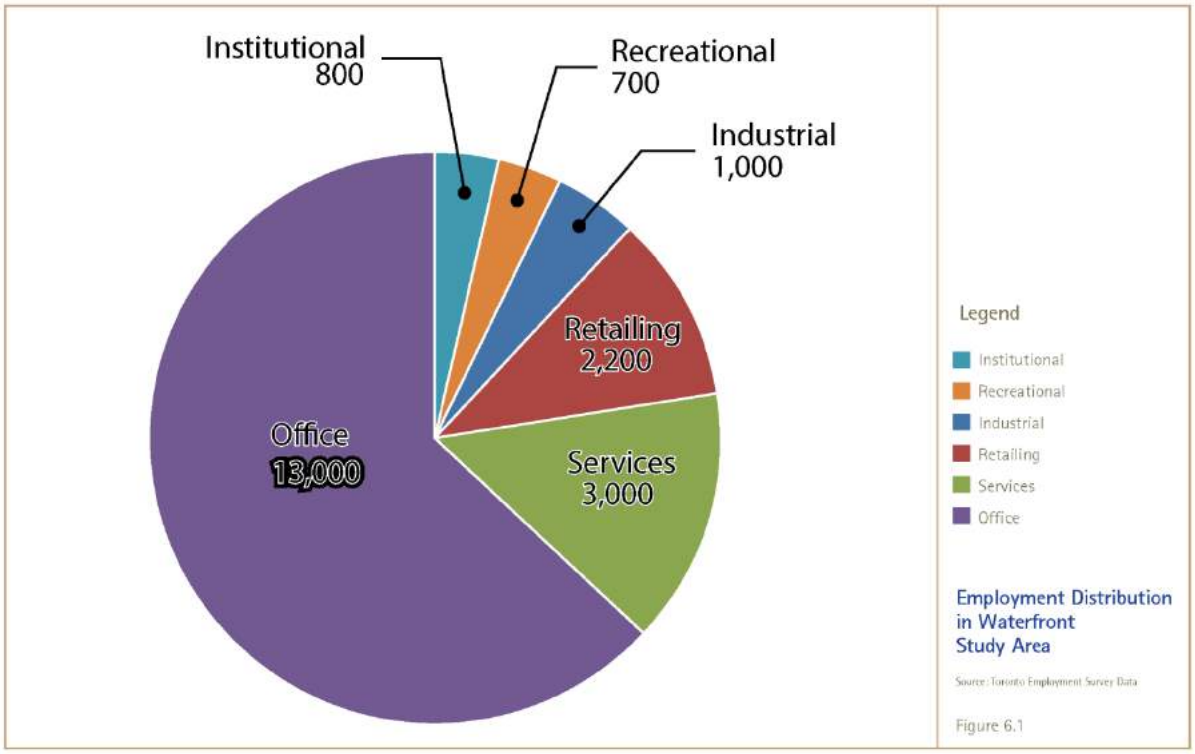
This section provides a description of the economic activity in the City of Toronto, central waterfront, and in the neighbourhoods directly adjacent to the Gardiner Expressway and Lake Shore Boulevard East being considered for reconfiguration.

The City of Toronto has a diverse, creative economy and is a globally competitive centre of commerce and innovation. Toronto serves as the economic and cultural capital of Canada. It has an annual gross city product of $151 billion, and is the fourth largest city in North America by population. In addition to being one of the larger financial centres in North America, the City benefits from strong employment in "creative" industries, including media, communication, and cultural industries. These economic sectors have created a vibrant city that attracts individuals from all over the world. Like all cities with this character of economic activity, Toronto is dependent on a complex set of drivers for its future growth, many of which could be impacted by future reconfiguration of the Gardiner Expressway and Lake Shore Boulevard East as a transportation artery and of the lands surrounding it as a development precinct. These drivers include the presence and accessibility of cultural and educational institutions, a high quality of life, attractive and centrally located housing and job centres, the efficiency of the regional transportation infrastructure, and Toronto's branding as a destination city.

Toronto's Waterfront area is home to a small, but growing population of businesses. The existing economic conditions in the study area include 20,600 jobs in 2012, which is about the same number as in 1993. Moving forward from 2013 on, this is changing every year with the redevelopment of the central waterfront.

Some of the most significant existing employment sites in the study area include properties operated by PortsToronto (formerly known as the Toronto Port Authority). PortsToronto was established for the purpose of operating the port and has legislated responsibility for all port activities related to shipping, navigation, transportation of passengers and goods, and the handling and storage of cargo. The port handles over 2 million tons of goods annually. In 1999, an economic impact study indicated that the port employed (both as direct employees and contractors) the equivalent of 1,500 full time jobs in cargo, tourism and recreation. In addition to the port, there are other employment sectors on the waterfront, many of which are complementary to the port activities. **Figure 3.37** illustrates the distribution of waterfront employment by sector.

Figure 3.37: Existing Employment Distribution in Waterfront Study Area



Along the Gardiner Expressway and Lake Shore Boulevard East corridor, there are a number of existing business operations that use the corridor as an important transportation artery. **Figures 3.28-3.32 - Existing Land Uses Along Corridor** in **Section 3.3.3** indicates the businesses along the corridor. These include:

- Between Jarvis Street and Parliament Street (East Bayfront area):
    - The Liquor Control Board of Ontario (LCBO), a provincial government enterprise, located south of Lake Shore Boulevard just west of Jarvis Street, and includes the LCBO head office, warehouse and a retail store;
    - Loblaws grocery store and parking garage is located on the northwest corner of Jarvis Street and Queens Quay;
    - FedEx Shipping Centre located between Jarvis and Sherbourne on the south side of Lake Shore Boulevard;
    - The remainder of East Bayfront adjacent to Lake Shore Boulevard is currently under redevelopment as part of the East Bayfront Precinct revitalization.

- Between Parliament Street and Don Roadway (Keating Channel Precinct area):
    - Lands are primarily vacant with one existing business, the PMR Auto Service Centre, located east of Cherry Street and north of Lake Shore Boulevard.
- Between the Don Roadway and Leslie Street (Port Lands and South of Eastern area):
    - Former Unilever manufacturing facility now owned by First Gulf, located on the northeast corner of Don Roadway and Lake Shore Boulevard. The manufacturing facility has been closed for many years and First Gulf currently has a development application in progress for redevelopment of the site as an employment area;
    - Cinespace Studios is located just east of the Unilever site at Booth Avenue and Lake Shore Boulevard. This is one of the remaining film studio employment uses in the South of Eastern area;
    - Greyhound Courier Express is located on the south side of Lake Shore Boulevard, between Saulter Street and Bouchette Street. It includes large surface parking for Greyhound buses;
    - Urbacon Construction Company and a Purolator distribution centre are located on the north side of Lake Shore Boulevard between Logan Avenue and Carlaw Avenue;
    - Mayfair Lake Shore Racquet Club (fitness and health facility), and an Esso gas station and Tim Hortons store are located on the south side of Lake Shore Boulevard between Logan Avenue and Carlaw Avenue;
    - Showline Studios is located south of Lake Shore Boulevard east of Carlaw Avenue;
    - Canroof Corporation is located on the east side of Showline Studios;
    - A TTC facility including Wheel-Trans is located east of Canroof;
    - Canadian Tire and associated big box development is located on the southwest corner of Leslie Street and Lake Shore Boulevard;
    - On the north side of Lake Shore Boulevard between Carlaw Avenue and Leslie Street there are a number of light manufacturing and warehouse facilities that do not front on to Lake Shore Boulevard.

The majority of existing businesses are low density and take up large sites for both building requirements and parking needs associated with the businesses. These sites reflect the history of primarily industrial uses along the waterfront.

Redeveloping the waterfront from predominantly industrial to other uses supports the continued evolution of the city's economy to a diversified range of uses, while preserving industrial jobs as appropriate. The future economic conditions (2031) in the waterfront precincts within the study area, including West Don Lands, East Bayfront, Lower Don Lands and Keating, consist of 2.3 million square feet of planned commercial space to be developed on public and private lands through catalytic public infrastructure investment over the next 30+ years. Full-time employment in the study area is estimated at over 28,000 jobs. It is estimated that the total value of waterfront development is at $11.3 billion or a net present value of $6.1 billion. These projections could be impacted through the reconfiguration of the Gardiner Expressway and Lake Shore Boulevard East as they relate to:

- the total amount of developable land parcels in the study area;
- the value per square foot of new development; and,
- the absorption rate, and timing of revenue flows to the public sector, of planned development.

The value of all existing and future proposed land and development in the EA study area and near it (including the Financial District) could be impacted by changes to the accessibility of these lands to the rest of the region.

With the anticipated growth in employment and commercial activities, the waterfront is developing in a manner that will also support growth as a tourist attraction. Surveys of tourists to Toronto indicate that the waterfront is a popular attraction. It is expected to become even more of a destination through the development of dynamic public spaces, cultural destinations, and recreation facilities, as well as construction of commercial and residential spaces. The redevelopment of waterfront public and community space is discussed further in **Section 3.3 Urban Design**.

4.0 Description and Evaluation of Alternative Solutions

This chapter describes and evaluates the alternatives to the undertaking (herein referred to as alternative solutions) for the project to determine a preferred solution. As it is common for alternative solutions to evolve during the EA process based on new information and feedback from stakeholders, the evaluation of alternative solutions was undertaken in two stages – the first stage further developed and evaluated the four alternatives of Maintain, Improve, Replace and Remove (Boulevard) that were presented in the EA ToR. Of the four alternatives assessed, the Stage 1 evaluation identified Remove as the technically preferred alternative solution. Although Remove was identified as technically preferred overall, there were some evaluation criteria for which Remove was not preferred (e.g., changes in commuter travel times). **Section 4.3** provides details regarding the Stage 1 evaluation. Following the completion of this evaluation, further direction was received by the City of Toronto's Public Works and Infrastructure Committee (PWIC) and a new alternative solution (the Hybrid) was proposed for further study. PWIC also directed the project team to review opportunities to minimize impacts on commuter travel times for the Remove alternative (referred to as the Remove optimization). This commenced Stage 2 of the alternative solutions evaluation. The new Hybrid alternative solution was then developed and compared to the optimized Remove alternative (the technically preferred alternative identified in the Stage 1 work). This chapter is organized on the basis of this two-stage alternative solutions evaluation process. Stage 1 is documented in **Sections 4.2** and **4.3** and Stage 2 is documented in **Sections 4.4** and **4.5**.

4.1 Alternatives Development Influences

To develop alternative solutions for the four alternatives of Maintain, Improve, Replace and Remove (Boulevard) that were presented in the EA ToR, the project team undertook a review of case studies of cities facing similar issues regarding what to do with aging elevated expressways in their downtowns. The project team also facilitated input on design ideas that were sought from international consultants. The following documents these two activities.

4.1.1 Case Study Review

To support the development of the alternative solutions, the project team reviewed a number of case studies to explore how other cities in the world have addressed the problem of aging highway infrastructure. The case studies included the following cities:

- Seattle, Washington, USA

- New York, New York, USA
- Montreal, Quebec, Canada
- Chattanooga, Tennessee, USA
- San Francisco, California, USA
- Seoul, South Korea
- Bronx, New York, USA
- Zaanstadt, The Netherlands
- Paris, France
- Buffalo, New York, USA
- Washington, DC, USA

Case studies were used to highlight potential alternatives and gain insight into different urban design strategies. The case studies provided a unique perspective and were aligned with the project team's goal of considering the undertaking from a perspective other than just transportation. The case studies also provided lessons regarding public and stakeholder input, costs and benefits, and implementation.

Key lessons identified from the case studies include:

- Solutions come in several shapes and sizes;
- Transportation solutions should focus on opportunities for city-building and improving quality of life;
- Transportation uses are continually evolving - changes in demographics, economics and lifestyle affect travel demand;
- Traffic demand can be managed;
- Transportation infrastructure offers extraordinary opportunities for design, creating new public realm;
- Infrastructure does not have to be single-purpose or boring;
- The public sector must be strategic in order to capture the value of investments in infrastructure to serve community and development goals; and

- City building projects of this magnitude require vision and active commitment at the highest levels of leadership – mayors, governors and city councils. Moreover, the full range of stakeholder input, from support to opposition must be understood to respond substantively.

Additional details about each case study are included in **Appendix C**, **Case Study Report**. The lessons learned through the case study review have helped to inform the development and evaluation of alternative solutions.

4.1.2 Design Ideas

To inspire the development of the alternative solutions, Waterfront Toronto and the City gathered design ideas from internationally renowned architects, planners and engineers in 2010. Six teams were selected to participate in the Design Ideas exhibition which focused on three of the alternatives: Improve, Replace and Remove. Two teams were assigned to each alternative to prepare design ideas. In June, 2013, the design ideas from the international teams were presented to the stakeholders and the public. Some of the key ideas that were identified included:

- A new iconic entrance into the city from the east;
- Adding new public open space and enhancing the public realm throughout the corridor;
- Balancing modes of transportation;
- Enhancing waterfront connectivity;
- Providing new transportation infrastructure;
- Reducing the infrastructure footprint; and,
- Freeing up land for redevelopment.

Appendix B, Record of Consultation, includes a summary of the inputs that were received through this Design Ideas process. Full copies of the design submissions were made available to the public on the consultation website.

In addition to the formal Design Ideas submissions, members of the public also submitted ideas for reconfiguring the expressway to Waterfront Toronto and the City. These public ideas, along with the international Design Ideas, were reviewed by the project team and considered in the preparation of the alternative solutions. The purpose of collecting Design Ideas and other public input was to assist the project team in identifying:

- A new vision for the study area;
- Critical opportunities and constraints for the design;
- Prioritizing key issues to be managed through reconfiguration; and,
- Inspiring urban design and infrastructure elements to be considered for each alternative solution.

The following presents a summary of the ideas collected through the public and international Design Ideas.

4.1.2.1 Improve

Improve focused on the public realm, creating new spaces and reimaging underutilized space for new parks, pathways, communities and market space. The focus was on improving connections and creating vibrant areas throughout the corridor that people want to be in. Some of the elements included adding new structures over or around the existing elevated Gardiner for park space and commercial/retail space. A common theme was to develop innovative solutions for greening the corridor. The existing condition is dominated by concrete road infrastructure with little vegetation.

KPMB Architects and BIG – Improve Submission "The GAR"

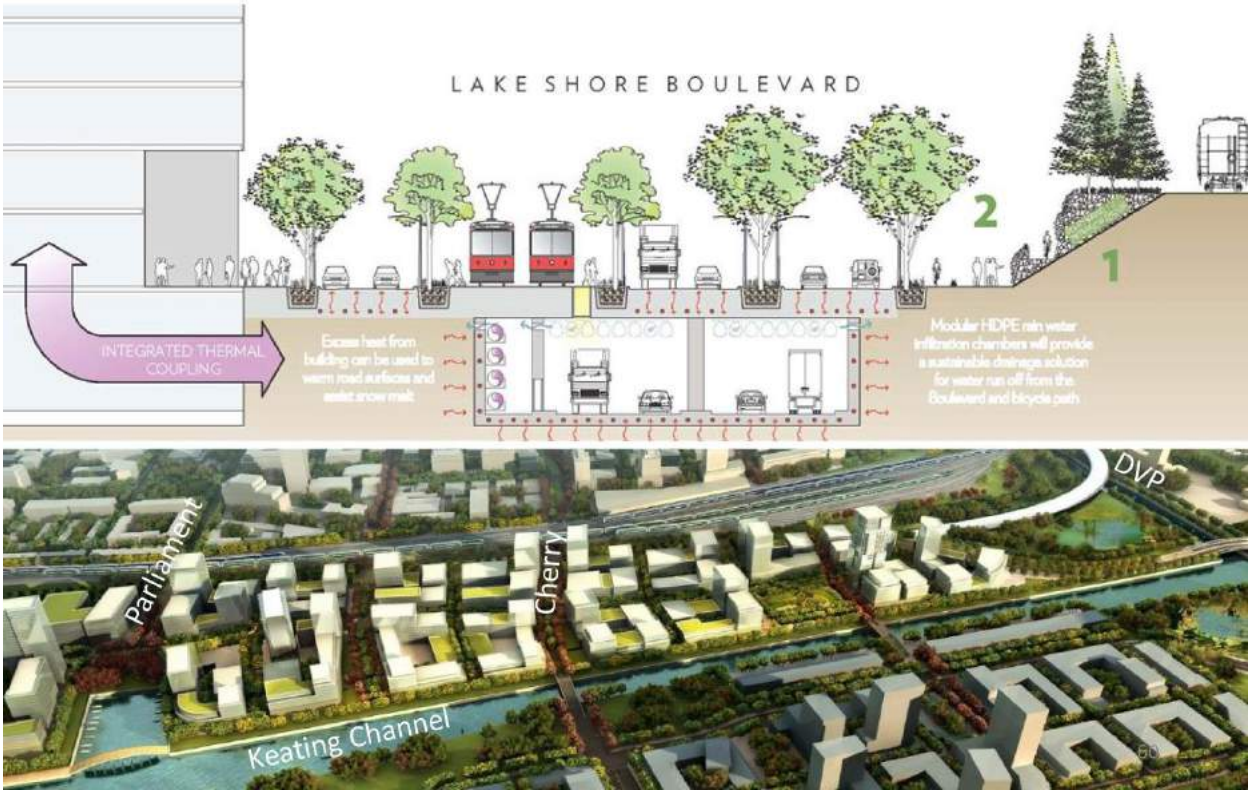
Diller Scofidio + Renfro and architechtsAlliance – Improve Submission "Gardiner City"

Les Klein – Improve public idea "Green Ribbon"

4.1.2.2 Replace

Replace focused on the opportunity to rebuild the expressway with new infrastructure, either above grade (elevated) or below grade (tunnel), to provide the highway traffic function. Replacing the existing structure opens up opportunities to explore new development blocks, connections, and public realm. Ideas for Replace brought focus to the challenge of consolidating infrastructure with the rail corridor and opening up Lake Shore Boulevard to light and air by removing the expressway overhead. Again, a common theme was the effort to green the area and allow for a more pedestrian scale environment. The designs presented innovative solutions for a tunnel and for consolidating the elevated expressway with the adjacent rail corridor. Both options open up the Lake Shore Boulevard corridor to be reimagined as a great street.

West 8, DTAH, Cecil Balmond and AGU – Replace (rail embankment) Submission "Stitching the City to its Lakefront"



Adrian Smith and Gordon Gill Architecture – Replace (tunnel) Submission "Four Flows"

4.1.2.3 Remove (Boulevard)

Remove focused on the opportunity to build a new boulevard and redefine the eastern downtown waterfront with an active and vibrant street. Removing the existing structure opens up opportunities to explore the alignment of a new eight-lane boulevard with new development blocks, connections, and public realm. Ideas for Remove brought focus to the challenge of balancing modes of transportation and creating a pedestrian friendly boulevard that would be a signature feature of the community. Again, a common theme was the effort to green the area and allow for a more pedestrian scale environment. The designs presented innovative solutions for a boulevard and new communities as a result. Both submissions from the design teams open up the new Lake Shore Boulevard to be reimagined as a great street.

Rem Koolhaus and Office for Metropolitan Architecture – Remove Submission "Toronto 2036"

James Corner Field Operations – Remove Submission "Toronto's Great Street"

4.2 Alternative Solutions Development & Evaluation: Stage 1

This section describes the development and evaluation of alternative solutions that were originally identified in the ToR for this EA.

4.2.1 Consideration of Public Input - Alternatives Development

Alternative solutions are intended to be conceptual in nature. They present the possibilities and limitations for each alternative. Once a preferred alternative solution is selected and supported by City Council, more detailed alternative designs are generated for the preferred alternative solution to explore the opportunities of the solution.

Input from agencies, stakeholders and the public has been an important component of the alternative solution development. The ToR provided the basis for developing the alternative solutions and identified four to be considered:

- Maintain the elevated expressway;
- Improve the urban fabric while maintaining the existing expressway;
- Replace with a new above or below grade expressway; and,
- Remove the elevated expressway and build a new boulevard.

On June 13, 2013, the Design Ideas from the international teams (see Section 4.1.2) were presented to the stakeholders and the public who were asked to provide both feedback on which ideas they did or did not like and offer ideas of their own. Between May and June, over 1,000 people provided their thoughts on the alternative solutions. Some of the key ideas that the public identified as important were:

- Balancing modes of transportation;
- Enhancing waterfront connectivity;
- Providing new transportation infrastructure; and
- Enhancing the public realm.

At the June 2013 public meeting people were also asked what information they needed to have in order to provide input on the alternative solutions. The most prevalent responses were:

- The financial implications and lifecycle costs of the alternatives;
- Traffic conditions for each alternative; and
- How the alternative solutions relate to the rail corridor.

Between June and October 2013, the alternative solutions were further developed and consulted on through agency and stakeholder meetings. Conceptual representations of the alternative solutions were then presented to the public for input at a second public meeting on October 16, 2013.

Input received from stakeholders, technical advisors, and the public, assisted in the development and refinement of the alternative solutions. At the October 2013 public meeting, more than 1,500 people provided input to the alternative solutions. Comments received regarding all four alternatives can be summarized as follows:

- For Maintain, people thought this was the least disruptive to traffic as it keeps the existing road capacity, but it is not a long-term solution and misses the opportunity to revitalize the area;
- For Improve, the added bicycle and pedestrian features were good but the cost of moving the columns of the elevated expressway in order to fit Lake Shore Boulevard entirely under the expressway was too expensive for the limited benefits it achieved;
- For Replace, the improved environment along Lake Shore Boulevard and the opportunities for development do not appear to be worth the costs, especially in reference to the extraordinary costs of the tunnel alternative; and
- For Remove, the revitalization and redevelopment of the area is good but there are concerns regarding traffic impact and whether an at-grade 8-lane boulevard would still be a barrier between the city and the waterfront.

As a result of the public input received at the October 2013 public meeting, revisions were made to the Improve and Remove alternatives. Improve revisions involved rethinking the alignment of Lake Shore Boulevard to be entirely under the Gardiner Expressway as the cost of moving columns to achieve this was a concern. Improve revisions also included new considerations to reduce the impacts of the existing ramps to and from the expressway along Lake Shore Boulevard and to improve intersections for safety, legibility and pedestrian experience. For the Remove alternative, revisions were made to improve the pedestrian experience of an 8-lane boulevard and to identify opportunities to develop a two-sided street. These revisions, along with the evaluation results, were presented to the public at the

February 6, 2014 public meeting. Sections 4.2.2 and 4.2.3 below present further details regarding the development and features of each alternative solution.

4.2.2 Alternative Solution Development Considerations

The alternative solutions were developed in an iterative manner by the project team that took into account several considerations including: the goals of the study, case studies, design ideas, stakeholder input, and constraints/opportunities within the study area. Various draft concepts were developed, reviewed and then revised with input from City of Toronto and Waterfront Toronto staff. Some of the key issues that were considered in the development of the alternative solutions included:

- Traffic operations;
- Traffic demand, patterns and the impact of travel times;
- Constructability;
- Right-of-way width (existing corridor varies from 42m to 77 m);
- Pedestrian and cyclist movement;
- Pedestrian crossing times of Lake Shore Boulevard;
- Pedestrian, cyclist and motorist safety;
- Number and width of roadway lanes;
- Median widths;
- Need and location of expressway access ramps;
- Adjacent land use;
- Availability of light within the corridor;
- Urban Design/new development opportunities;
- New public realm creation;
- Connecting with existing road infrastructure;
- Potential property impacts.

4.2.3 Description of Alternative Solutions

The following sub-sections provide a summary of the final alternative solutions developed from input through the design ideas, stakeholder meetings, technical advisory meetings and public input.

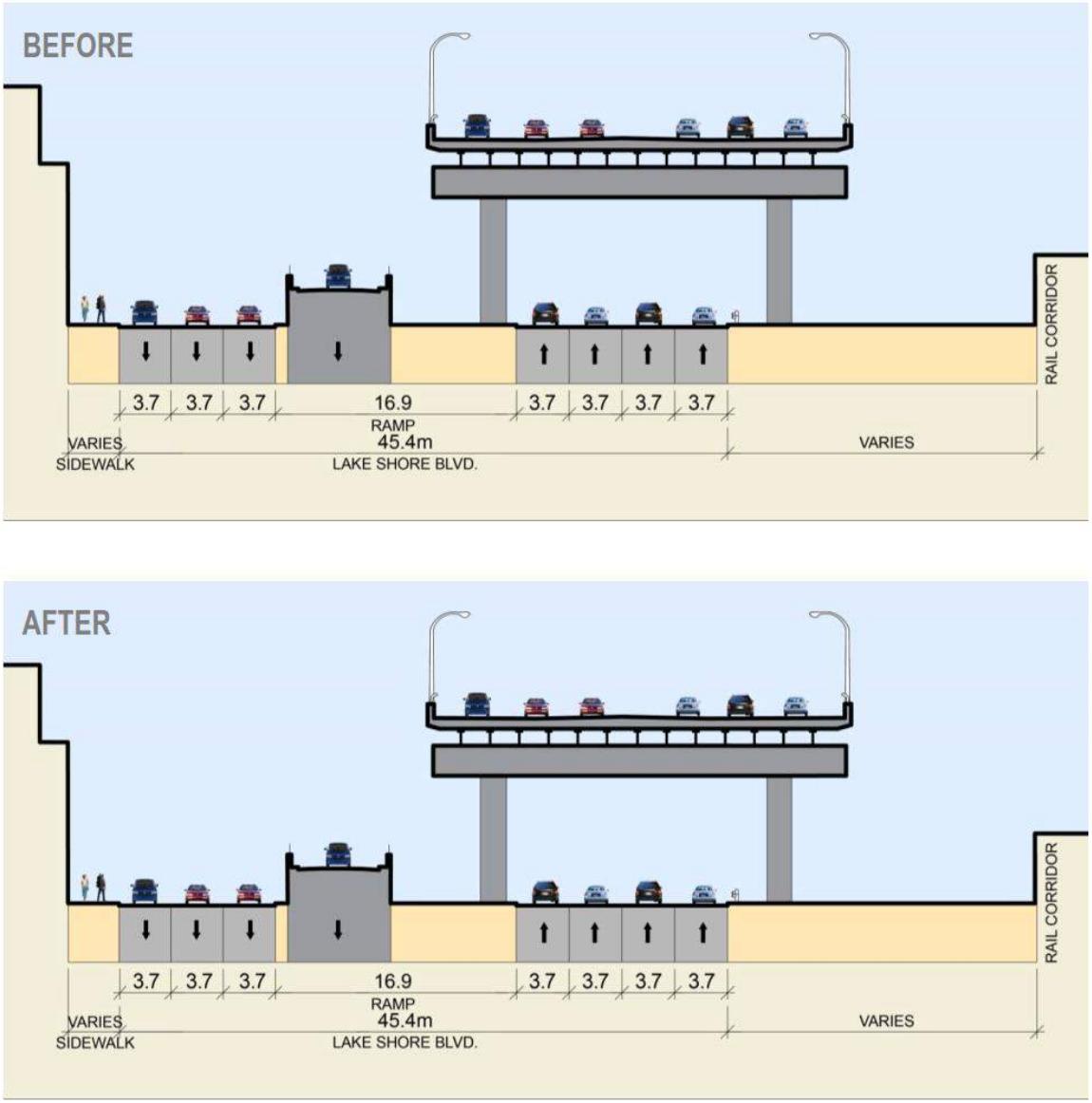
4.2.3.1 Maintain

The Maintain alternative included the completion of the 2013 Gardiner East rehabilitation program, which requires complete reconstruction of the deck of the expressway. Maintain also included implementation of the precinct plans as they are approved currently. This included the realignment of Lake Shore Boulevard through the Keating Channel Precinct between Cherry Street and the Don Roadway. The realignment of Lake Shore Boulevard would position Lake Shore further north through this area of Keating and allow the Keating Channel edge to be reclaimed for a pedestrian promenade, recreation and public space. **Figure 4.1** illustrates the cross section for Maintain.

Figure 4.1: Maintain Cross Section

Maintain

Cross Section of Gardiner/Lake Shore Blvd corridor looking west at Jarvis Street



4.2.3.2 Improve

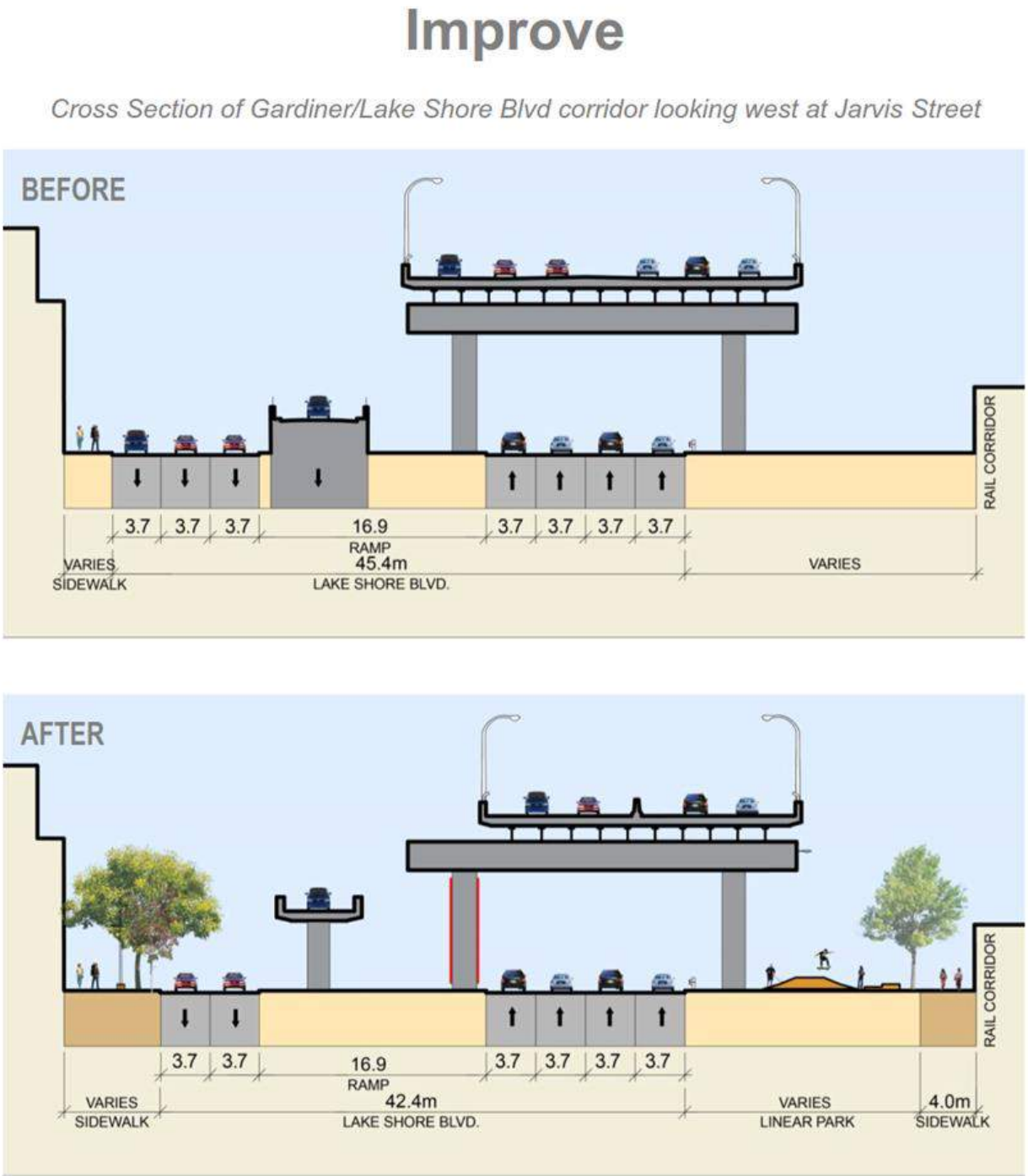
The Improve alternative involved the following elements:

- Rebuilding the expressway deck with four basic lanes (the existing deck contains six basic lanes) with additional speed change lanes for on-off ramps where required. The four basic lanes would be shifted to the north side of the existing Gardiner corridor and the space where the southern two lanes currently exist would be opened up to light and air that would improve the pedestrian experience at grade.
- Lake Shore Boulevard would largely stay where it is between Jarvis and Cherry Streets. Modest improvements would be made at intersections to improve crossings for pedestrians and limit auto conflicts with pedestrians and cyclists.
- The Jarvis Street on- and off-ramps to and from the Gardiner would be shortened, moving their entry points further away from Jarvis Street, to open up more space at grade.
- Dedicated turning lanes for Gardiner on- and off-ramps would be reduced to connect directly with Lake Shore Boulevard. This would reduce the number of access ramps that pedestrians have to cross at intersections.
- A continuous bicycle path would be created on the north side of Lake Shore Boulevard east of Jarvis Street.

- Where possible, the underutilized space on the north side of the corridor abutting the rail property between Jarvis Street and Cherry Street would be redesigned to include hardscape public spaces such as skateboard parks. This would be adjacent to the bicycle/walking path.
- The southernmost eastbound lane on Lake Shore Boulevard would be removed east of Jarvis Street. This space would be redesigned for improved pedestrian space, landscaping and public realm.
- The realignment of Lake Shore Boulevard through the Keating Channel Precinct between Cherry Street and the Don Roadway would be completed as per the approved Keating Channel Precinct Plan. This is consistent with the Maintain solution.

Figure 4.2 illustrates the cross section for Improve.

Figure 4.2: Improve Cross Section



4.2.3.3 Replace

The Replace alternative began with three options to replace the elevated expressway with either: a new above- or below-grade expressway considered an extension of the rail embankment; a below-grade tunnel (cut and cover) expressway; or a new elevated expressway. In order to determine which alternative solution should be carried forward to represent the Replace alternative, a screening level assessment was completed to identify the benefits and challenges of these options. The screening focused on assessing the technical feasibility of the alternatives given the physical constraints of the corridor. This included, for example, considerations for land requirements, constructability, transition area needs/impacts, ramp connection opportunities, new development and open space creation, estimated cost envelope, and overall corridor experience. A discussion of the screening assessment findings for the Replace option (embankment, tunnel, new elevated) is provided below.

Replace: Embankment

Previous studies conducted on the Gardiner Expressway included investigating the opportunity to extend the existing rail berm along the north edge of the corridor to accommodate expressway vehicle lanes. Providing ramps to connect to north-south roads and the transition to the existing elevated Gardiner at either end was a challenge with this option. In addition, the Gardiner East EA study team met with Metrolinx to discuss this option in the summer of 2013. Recognizing the growing importance of rail, particularly GO Transit, as a means to access the Downtown for GTA commuters, Metrolinx advised that using any of the rail lands for a roadway would not be possible as all rail lands are required to support future rail expansion plans. The embankment option was therefore not carried forward as a Replace alternative.

Replace: Tunnel

The below grade tunnel presented the greatest opportunity to transform the ground level experience of the Gardiner Expressway and Lake Shore Boulevard East corridor. New land would be opened by placing at new at-grade Lake Shore Boulevard over top of the buried Gardiner Expressway freeing up lands within the corridor. Transfers between the buried Gardiner would not be possible and it would function as a through-traffic route only. With Gardiner through-traffic functions placed below grade and only Lake Shore Boulevard at ground level, new public land would become available allowing enhanced connections between the city and the waterfront. It would transform Lake Shore Boulevard into an active and inviting local boulevard. The pedestrian environment, public realm, parks and open spaces would be developed to create new destinations. The tunnel would provide for an express auto-transportation facility to bypass the east end of Downtown while Lake Shore Boulevard would provide at-grade access to Downtown.

Although the opportunities of a tunnel are plentiful, there were many technical and financial challenges that arose while developing the tunnel option for the Replace alternative solution. The transition areas posed a technical challenge in terms of connecting a below-grade tunnel to existing structures elevated up to 10 m above-grade on either end. At the west-end transition the tunnel would need to connect to the existing Gardiner structure west of Jarvis Street. At the east end the tunnel would need to connect to the DVP ramps that traverse over the Don River. The transition areas ended up being 500 m in length on either end. As such the tunnel was only approximately 1 km in length before it had to begin ascending on either end. The length of the transition areas also limited redevelopment potential above grade as there would be significant segments of land abutting transition ramps to and from the tunnel that would not be ideal for development.

In addition to the lengthy and complicated transition areas there would be no opportunities for midsection ramp connections to and from the tunnel. Tunnel access would only be possible at the two ends. With only 1 km of tunnel there would be no opportunity to connect ramps to/from the tunnel between Jarvis Street and the DVP. As such, one of the primary connections that exist today through the Jarvis/Sherbourne ramps would be lost.

Finally, from a technical point of view, the east-end entrance into the tunnel from the DVP ramps would be located in a flood zone. This adds significant technical challenges and increases the cost in order to design the tunnel so as to address flooding potential.

From a cost perspective, the tunnel is by far the most expensive solution. Although the tunnel length is short, the cost comes from the complicated transitions.

A summary of the benefits and challenges of the tunnel option were presented to stakeholders and the public in October 2013. It was determined by the technical EA team, Waterfront Toronto, City of Toronto, and with input from stakeholders and the public, that the tunnel would not be carried forward for further consideration.

Replace: New Elevated

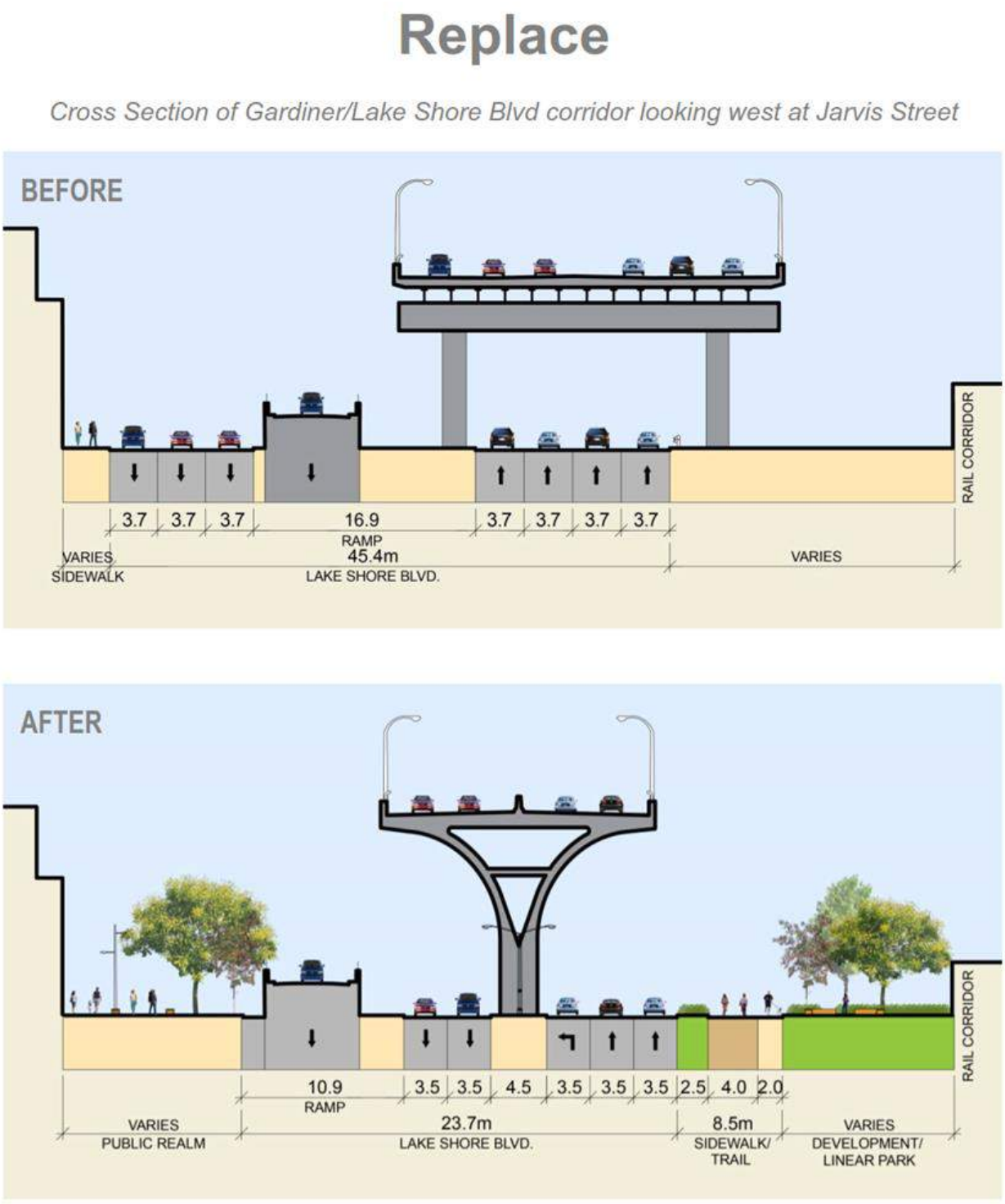
Replace the existing expressway with a new elevated structure was developed and carried forward as the alternative solution for Replace.

The Replace alternative with a new elevated structure included:

- Construction of a new 4-basic lane elevated expressway between Jarvis Street and the DVP. Design of the structure would include a single, centre column to support the structure that would be more widely spaced than the distance between columns today.
- New ramp connections would be built to connect to the DVP.
- The new elevated expressway would be aligned through the north section of the Keating Channel Precinct between Cherry Street and the DVP ramps. This opens up land along the Keating Channel for redevelopment.
- The new structure would be 5 m higher than the existing Gardiner structure. This opens up access to light and air at grade and allows for landscaping and tree planting along Lake Shore Boulevard.
- New ramp connections would be built to provide the Jarvis/Sherbourne connections.
- Lake Shore Boulevard would be rebuilt as a 4-lane boulevard situated underneath the new elevated expressway.
- New development parcels along the south edge of Lake Shore Boulevard would be available and
- Opportunities for new parks and public spaces would be created between the rail corridor and the north side of Lake Shore Boulevard.
- A new east-west continuous bicycle path would be developed on the north side of Lake Shore Boulevard.

Figure 4.3 illustrates the cross section for Replace.

Figure 4.3: Replace Cross Section



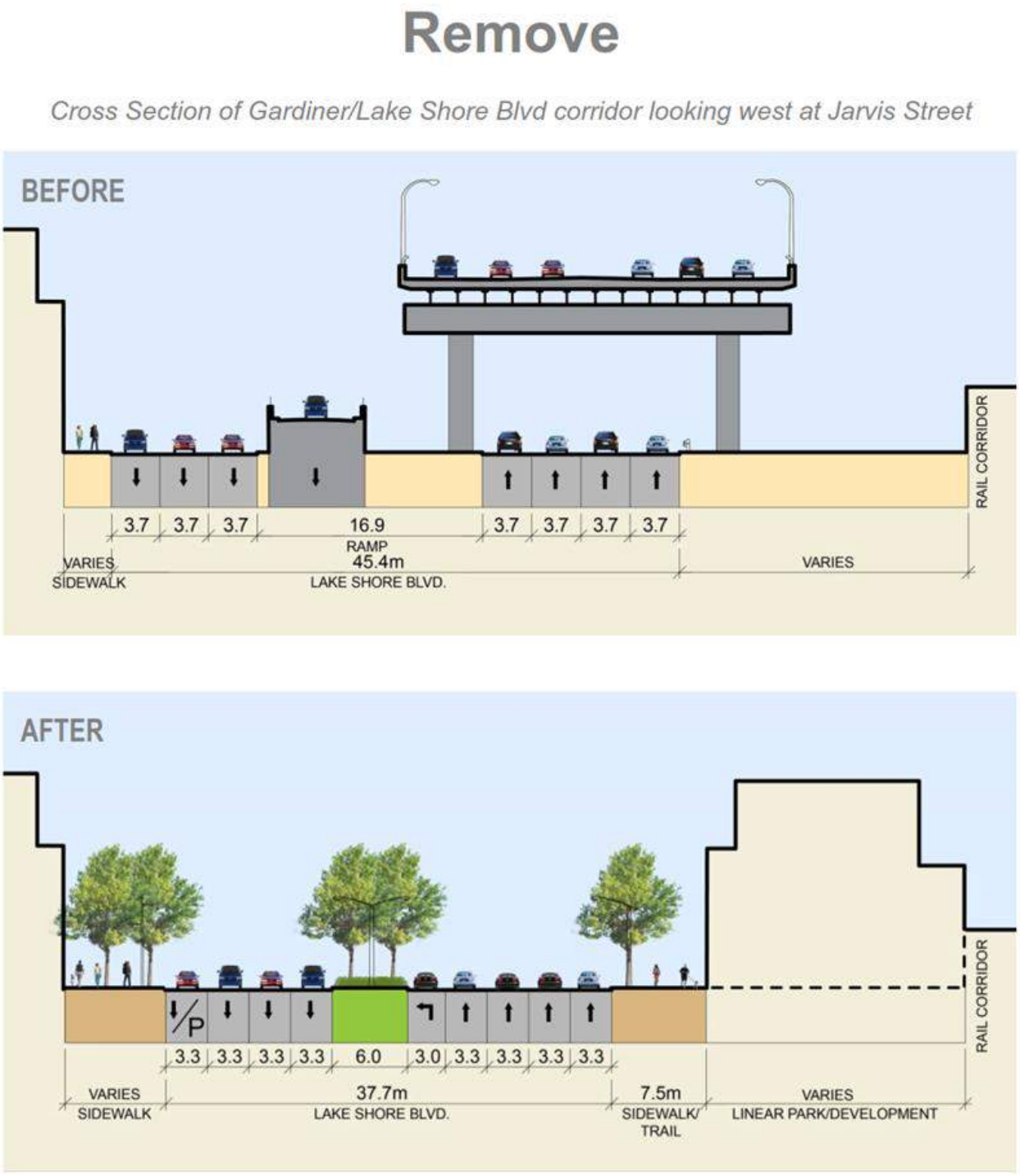
4.2.3.4 Remove (Boulevard)

The Remove alternative solution involved the demolition of the existing Gardiner Expressway east of Jarvis Street and the construction of a new 8-lane boulevard with potential for new development on both the north and south sides of the street. The Remove alternative would open up the corridor to light and air and would allow for a boulevard planted with two continuous rows of trees. The transition from the boulevard back up to the existing elevated expressway in the west end of the study area would occur between Yonge Street and Jarvis Street.

Signalized intersection crossings would be provided at all north-south crossing roads and left turn lanes established along Lake Shore Boulevard (currently no separate left turn lanes exist on Lake Shore Boulevard in this section). Although the alignment is similar, the configuration of Lake Shore Boulevard through the Keating Channel Precinct between Cherry Street and the Don Roadway would be modified from that in the approved Keating Channel Precinct Plan given the need for additional lanes and revised connections to the Don Valley Parkway in this area. Two-lane ramps would connect to and from the Don Valley Parkway and to and from Lake Shore Boulevard to the east.

Opportunities for new development parcels on the north side of the new green boulevard would allow for a buffer between the rail corridor and Lake Shore Boulevard. Dedicated left-turn lanes would exist at the intersections and the potential for off-peak parking would exist in the southern eastbound lane. A new continuous bicycle path would be developed on the north edge of Lake Shore Boulevard. **Figure 4.4** illustrates the cross section for Remove.

Figure 4.4: Remove Cross Section



4.3 Evaluation Criteria

The assessment and evaluation of the alternative solutions was based on a set of evaluation criteria and measures that represent the broad definition of the environment and consider both

qualitative and quantitative (i.e., numerical) data. These criteria and measures are organized on the basis of the four study lenses and 16 criteria groups. The four study lenses, as outlined in the EA ToR are Transportation and Infrastructure, Urban Design, Economics and Environment.

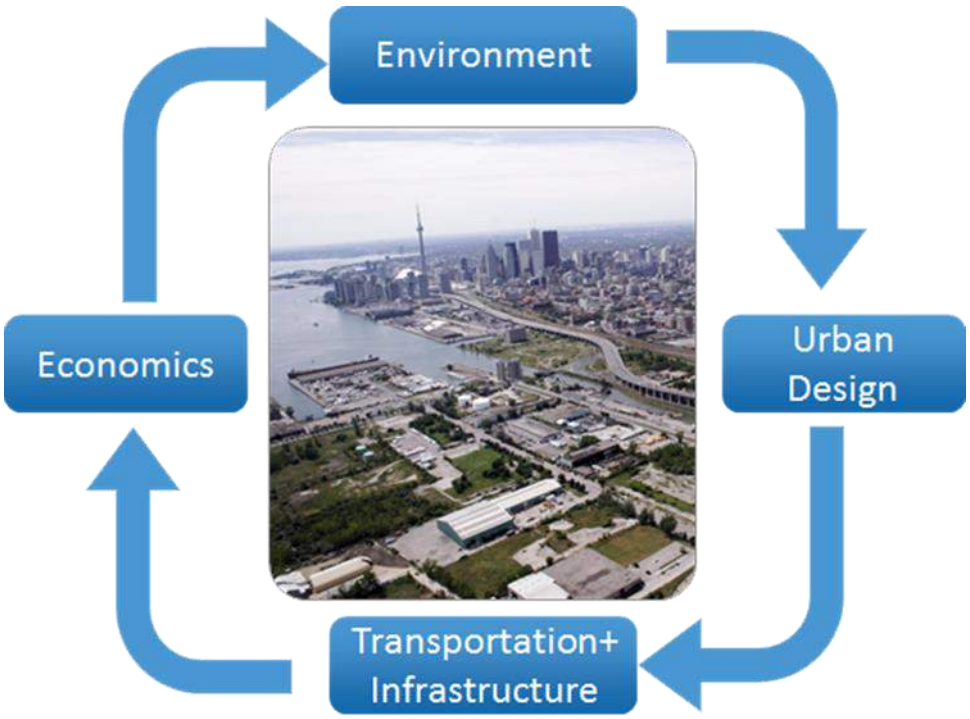


Table 4.1 presents the criteria groups and criteria that provided a framework for the evaluation. Also provided is a definition of each of the criteria. The criteria were developed considering the nature of the project and characteristics of the study area. The draft criteria were presented to the Stakeholder Advisory Committee (SAC) and the public in October 2013 in conjunction with the draft alternative solutions. Comments received on the criteria were considered in their finalization.

For each of the criteria, one or more measures were developed. The measures specify the data to be collected and/or the effects to be assessed for each criterion.

Table 4.1: Evaluation Criteria Groups and Criteria

Study Lens/Criteria Group	Criteria	Definition
TRANSPORTATION & INFRASTRUCTURE		
Automobiles	Commuter Travel Time (Average travel time for AM peak hour)	Average in-bound peak hour travel time using EMME and PARAMICS model outputs between selected Origin-Destination (OD) pairs.
	Impact on Average Auto Travel Time (peak AM hour) within Downtown/ Primary Transportation Study Area	Change in average peak hour travel times (all directions) in PARAMICS model for local traffic trips within Spadina Avenue and Woodbine Avenue south of Dundas Street.
	Road Network/ Flexibility Choice	Number of available road network connections that provide drivers with the ability to accommodate planned future transit service.
Transit	Transit Impact	Change in average travel times in PARAMICS model for street cars on Dundas Street, Queen Street and King Street and impact on subway service. Ability to accommodate planned future transit service.
Pedestrians	North-South Sidewalks	Extent, quality and condition of pedestrian connections crossing Lake Shore Boulevard. Walking distance across Lake Shore Boulevard at major north-south streets (e.g., Jarvis Street).
	East-West Sidewalks	Extent, quantity and condition of pedestrian connections along Lake Shore Boulevard.

Study Lens/Criteria Group	Criteria	Definition
Cycling	East-West Movement	Extent and quantity of east-west cycling facilities and opportunities to connect with existing and planned north-south cycling facilities.
Movement of Goods	Vehicle Operations	Extent to which truck movement and operations could be impacted from changes in road capacity.
	Access Opportunity	Extent of access to properties in the study area (number of turning prohibitions that limit access opportunities).
Safety	Safety Risk for Pedestrians	Extent of automobile traffic exposure for pedestrians at intersections and crossing Lake Shore Boulevard (number of lanes to cross).
	Safety Risk for Pedestrians and Cyclists	Extent to which pedestrians and cyclists are exposed to free flowing/uncontrolled traffic flow. This includes free-flowing access ramps to and from the Gardiner Expressway where automobile traffic has the right of way.
	Safety Risks for Cyclists and Motorists	Extent to which there are road safety concerns for cyclists. Includes poor sight lines and intersection turns that cross cycling facilities without controlled traffic lights.
Constructability	Duration	Number of years required to complete construction, with an emphasis on the number of years that will result in traffic impacts.
	Transportation Management	Extent of pedestrian and cycling facilities to be affected during construction. Level of traffic disruption during construction and potential for disruption to other roadways from traffic diversion.

Study Lens/Criteria Group	Criteria	Definition
	Construction Impact on Private Property	Extent of private property to be used during construction and potential access to private properties (e.g., driveways) to be impacted.
URBAN DESIGN		
Planning	Consistency with Official Plans	Extent to which the principles and recommendations of the Central Waterfront Secondary Plan are accommodated and supported.
	Consistency with Precinct Plans	Extent to which the goals, objectives and recommendations of the East Bayfront and Keating Channel Precinct Plans are accommodated and supported.
Public Realm	Streetscape	Quality and consistency of a cohesive street design and character along Lake Shore Boulevard. Considers the balance between hardscape (e.g., paved road surface) and softscape (e.g., landscape, open space, etc.).
	View Corridors	Visual sight lines within and across the corridor to destinations and landmarks in and surrounding the study area (e.g., views of the water and downtown skyline).
	Public Realm Space (open space, landscape, multi-use paths, tree canopy, etc.)	Public space that is created for passive and active recreation and leisure including parks, plazas, trails, streetscapes, etc.
	Rail Corridor and Berm	Opportunity to minimize the visual and noise impacts of the rail corridor for pedestrians on Lake Shore Boulevard.

Study Lens/Criteria Group	Criteria	Definition
Built Form	Street Frontage	Relationship between development and Lake Shore Boulevard at the pedestrian scale. This includes the active at-grade uses in buildings fronting onto Lake Shore Boulevard that may contribute to street character and vibrancy. Also includes the average number of podium floors with obstructed views and limited access to light and air that may limit programming/leasing those floors.
ENVIRONMENT		
Social & Health	Health (Air Quality & Noise)	Air quality conditions at the local and regional level, including changes in NOx, VOCs, PM2.5, as well as the level of greenhouse gas emissions. Noise levels at various receptors locations in the study area.
Natural Environment	Terrestrial Environment	Conditions for land-based natural habitat, species and features.
	Aquatic Environment	Conditions for aquatic-based habitat, species and features.
	Water Quality	On-site capability to treat stormwater and manage the conditions/quality of water run-off.
	Water Quantity	Amount of stormwater run-off potentially generated.
	Microclimate	Local atmospheric conditions related to sunlight and temperature.
	Tree-Lined Shaded Street	Amount of trees that can grow in the corridor and the percent of tree canopy coverage possible.

Study Lens/Criteria Group	Criteria	Definition
Cultural Resources	Built Heritage	Potential for impact on historic physical architecture and cultural property that is inherited and maintained within the corridor.
	Cultural Landscape	Potential for impact on the existence of a built or natural landscape that is valued by people for its religious, artistic or cultural associations within the corridor.
	Archaeology	Potential for impact on known buried resources or artefacts within the corridor.
	First Nations People and Activities	Potential for impact on the use of the study area by First Nations for traditional purposes.
ECONOMICS		
Regional Economics	City Competitiveness	Influence on the regional economy of the Greater Toronto Area.
	Post-Construction Congestion	Influence of traffic congestion resulting from the alternatives to influence the regional economy of the Greater Toronto Area.
Local Economics	Business Activity	Number of jobs created in the study area.
	Visitor/Tourism Attractiveness	Change in the attractiveness of the waterfront for visitors to the area related to tourism.
	On Street Parking	Parking opportunities on Lake Shore Boulevard.
Direct Cost & Benefit	Capital Cost & Funding	Capital cost to construct the alternatives in 2013$, including the cost to acquire private property (if required). The funding is currently available in the City budget for rehabilitation.

Study Lens/Criteria Group	Criteria	Definition
	Lifecycle Cost	Net present value of construction cost and 100-year operations and maintenance costs of the alternative.
	Land Value Creation	Amount of money that could be generated through the creation and sale of new land for the City.

4.3.1 Evaluation Approach

To compare the advantages and disadvantages of the alternatives, both construction effects and long-term operations effects were identified and assessed based on the criteria and definitions previously noted. Qualitative and quantitative data were collected and considered.

Much of the lands in the study area adjacent to the Gardiner-Lake Shore Boulevard corridor are in transition. Based on current City Precinct Plans, Master Plans and the CWSP, these former industrial lands are to be transformed from their current vacant/underutilized state, to mixed-use communities with commercial, office and residential uses. Some of the industrial uses will also remain that relate to the Toronto Port operations (e.g., Redpath Sugar). The potential for both construction and operation effects on these communities resulting from the alternative solutions have been considered. Regarding the construction period, while it is assumed that construction would not start until 2020, for the construction effects assessment it was assumed that land uses in the vicinity of the project location are similar to current (2013) land uses. Additionally, as previously noted, the base year for operation effects is 2031. The analysis assumed the full build out of the study area including the East Bayfront Precinct, Keating Channel Precinct and Port Lands would be fully built-out by 2031. As it is likely that full build-out of the study area would not be achieved until after 2031(some areas would be 40-50 years before full build out is achieved), the effects assessment work is considered to be conservative.

The evaluation of the alternative solutions was based on a qualitative or “reasoned argument” approach as the evaluation criteria include a mixture of quantitative and qualitative data. Data was collected on the basis of the evaluation criteria/measures. Considering this data, alternative preference rankings were then determined for each measure and these rankings were then considered to generate alternative preference rankings by criteria group.

It is typical in EAs to not have an alternative that is preferred for all the evaluation criteria. When comparing alternatives, there are often trade-offs that need to be made to select the technically preferred alternative. To highlight these trade-offs and to assist in the selection of the preferred alternative, a "paired-comparison" approach was used. This approach involves the comparison of the alternatives in pairs considering the alternative preference rankings by criteria group. The preferred alternative of the pair is then carried forward for the next comparison. The alternative that is determined to be preferred over all the other alternatives is considered to be the overall technically preferred alternative. The paired comparisons of the alternatives were completed at a criteria group level. Considering the alternative preferences by criteria group, the key trade-offs were then highlighted by Evaluation Lens (four lenses were considered, see Section 4.2).

For the purposes of this evaluation, a relative weighting was not applied to the criteria groups, criteria or measures considered. The decision to not weight the criteria reflects the study goals as presented in the EA ToR. It is noted that the public was asked to provide input on the relative importance of the criteria groups at the October 2013 public meeting; however, there was no consistent feedback on the relative importance of the criteria groups. Details regarding public input received are provided in **Appendix B, Record of Consultation.**

4.3.2 Alternatives Evaluation

The following section presents the results of the assessment and evaluation of the four alternative solutions. **Table 4.2** presents the data/effects by measure for each of the alternatives. The data in this table provides the basis for the comparative evaluation of the alternatives. Preference rankings are first provided by study lens/criteria group. Following this is a discussion of the trade-offs of the alternatives resulting in the identification of a recommended alternative.

4.3.2.1 Criteria Group Ranking Rationale

The following provides the rationale for the preference rankings of the alternatives for each of the 16 criteria groups as presented in **Table 4.2**. For each criteria group, the alternatives have been ranked in order of preference: Preferred, Moderately Preferred or Less Preferred. The rankings are relative, not measures of acceptability/unacceptability. As such, a ranking of Less Preferred does not necessarily mean that the alternative is considered to be unacceptable for a particular measure or criteria group, just less preferred than the other alternatives. The alternatives preference rankings by criteria group were considered in the overall evaluation to identify a preferred alternative.

Table 4.2: Alternative Solutions Full Evaluation Matrix

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
TRANSPORTATION & INFRASTRUCTURE						
Automobiles	Commuter Travel Time (Modeled average travel time for AM Peak Hour) *Note:* Transportation demand based on regional projections for growth expected by 2031 in addition to full build-out of East Bayfront, Keating, Port Lands expected to occur over a 40-50 year timeline.	**North York to CBD** – Victoria Park/ Finch to Front/ Bay [A-D]	50 min (Existing travel time modeled at 45 min)	55 min		60 min
		Don Mills to CBD – Don Mills/ Eglinton to Front/ Bay [B-D]	30 min (Existing travel time modeled at 25 min)	35 min		40 min
		Scarborough to CBD – Victoria Park/ Kingston to Front/ Bay [C-D]	25 min (Existing travel time modeled at 20 min)		30 min	30 min
		Etobicoke to CBD – Kipling/Lake Shore to Front/Bay [E-D]	25 min (Existing travel time modeled at 25 min)	30 min		
		Auto travel time sensitivity to future transit scenarios	**Equally Preferred –** Travel times for most of the selected O-D pairs increase by between 2 and 4 minutes without the planed transit projects. (based on no new transit sensitivity runs for Maintain and Remove)			
		Average travel times between representative Origins and Destinations	**Preferred** – Generates the lowest modeled auto travel times.	**Moderately Preferred** – Generate higher travel times than Maintain, but lower modeled auto travel times than Remove.		**Less Preferred** – Generates the highest modeled auto travel times.
	Impact on Average Auto Travel Time (AM peak hr.) Within Downtown/ Transportation Study Area	Total Volume Assigned (reflects available road capacity)	70,500			63,000
		Percentage/volume (vehicles per hr.) of vehicles experiencing increased travel time over Maintain Alternative				
		< 2 min	Base case to compare alternatives. Auto travel time increases between today and 2031 assumed in base case as per Commuter Travel Time	85% (59,500 vph)	80% (57,000 vph)	75% (48,000 vph)
		2-7 min		15% (11,000 vph)	20% (13,500 vph)	20% (12,500 vph)
		> 7 min		0	0	5% (2,500 vph)

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
			analysis above.			
		Trip Reduction/Diversion	Approximately 15%			Approximately 25%
		Overall impact on auto travel in Downtown	**Preferred** – Generates the lowest modeled auto travel times in downtown area.	**Moderately Preferred** – Generates higher modeled downtown auto travel times than Maintain, but lower travel times than Remove.		**Less Preferred** – Generates the highest modeled downtown auto travel times.
	Road Network Flexibility/ Choice	Turning prohibitions at key intersections *<u>Existing</u>* *Jarvis Street: 4 prohibitions* *Sherbourne Street: 2 prohibitions* *Parliament Street: 1 prohibition* *Cherry Street: 2 prohibitions* *Don Roadway: 3 prohibitions*	**Less Preferred:** Jarvis Street: 4 prohibitions Sherbourne Street: 2 prohibitions	**Moderately Preferred:** Jarvis Street: 2 prohibitions Sherbourne Street: 1 prohibition	**Preferred** – None	
		Automobiles Summary Ranking	**Preferred**	**Moderately Preferred**		**Less preferred**
Transit	Transit Impact	Impact on surface transit service Note: Assumes no service improvements of the existing Queen, Dundas and King lines.	**Preferred –** Base case	**Preferred** –Essentially same as base case	**Less Preferred –** Results in minor increases in travel time (between 1 and 4 minutes per streetcar) when compared to Maintain Option.	**Less Preferred –** Results in minor increases in travel time (between 1 and 4 minutes per streetcar) when compared to Maintain Option.
		Impact on subway service	**Equally Preferred –** No impact to subway transit			
		Ability to accommodate planned transit service	**Less preferred** – Can accommodate the Downtown Relief Line, Waterfront LRT. Cherry Street LRT, and expansion of GO Transit Service.		**Preferred** – Accommodates same planned transit projects but provides greater flexibility in transit planning east of the Don River (e.g., Broadview Extension).	
		Transit Summary Ranking	**Equally Preferred**			
Pedestrians	North-South sidewalks	Ability to physically implement City standard north-south sidewalks for use by the local	**Less Preferred** – Existing sidewalks are substandard along north-south streets.	**Moderately Preferred** – Improvements not possible at all north-south crossings.	**Preferred** – Reconstruction of the corridor allows for sidewalks to be built to City standards along the entire length of Lake Shore Boulevard.	

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
		community and travelers.				
		Crossing Points *Existing Crossing's Permitted:* *Jarvis – East Leg, West Leg* *Sherbourne – East Leg, West Leg* *Parliament – East Leg* *Cherry – East Leg, east intersection* *Don Roadway – East Leg*	**Less Preferred** – Existing constraints do not allow standardization of crosswalks on both the east and west side of the street. Improvements not budgeted under rehabilitation program.	**Less Preferred** – Improvements and standardization possible at a number of intersections given infrastructure improvement. However, existing constraints do not allow standardization of crosswalks on both the east and west side of the street for all intersections.	**Preferred** – Reconstruction of the corridor allows for city standard crosswalks to be built on both the east and west side of the street.	
		North-south crosswalk crossing distance at Lake Shore Boulevard (linear metres)	*(W = westside crossing, E = eastside crossing)*			
		Jarvis Street	45.4m W, 44.5m E	42.4m W, 48.4m E	23.7m W, 25.7m E	37.7m W, 37.4m E
		Lower Sherbourne Street	48.3m W, 41.4m E	41.8m W, 51.1m E	23.7m W and E	37.5m W and E
		Parliament Street	29m W, 29.2m E	25.3m W, 26m E	25.5m W, 25.1m E	38.5m W, 38.9m E
		Cherry Street	33.5m W, 31.4m E	28.7m W, 20.3m E	25.3m W, 22.4m E	39m W, 36.2m E
		Don Road	Not available W, 42.1m E	Not available W, 25.9m E	Not available W, 30.5m E	Not available W, 29.6m E
		Broadview Ave./ Saulter St.	Not possible	Not possible	25.8m W and E	25.8m W and E
		Bouchette Street	Not possible	Not possible	25.8m W and E	25.8m W and E
		Logan Avenue	Not possible	Not possible	26.9m W, 27.8m E	26.9m W, 27.8m E
		Carlaw Avenue	29.9m W, 31.3m E	29.9m W, 31.3m E	28.9m W, 31.3m E	28.8m W, 31.3m E
		North-south crosswalk average for both east and west side of street (linear metres)	**Less Preferred** – 36.9 m	**Moderately Preferred** – 33.7 m	**Preferred** – 26.1 m	**Moderately Preferred** – 32.4 m
	East-West sidewalks	Ability to physically implement City standard east-west sidewalks as measured by	**Less Preferred** – Existing sidewalks are sub-standard and or not existing in parts of the	**Moderately Preferred –** Sidewalk on the north side of Lake Shore Boulevard are not possible between	**Preferred –** Reconstruction of the corridor allows for sidewalks to be built to City standards along the entire length of Lake Shore Boulevard for use by both the local community and travelers on the north and	

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
		length along the corridor for use by the local community and travelers.	corridor. Improvements not budgeted under rehabilitation program. Re-alignment of Lake Shore Boulevard in Keating allows for sidewalks on both the north and south side for all options. 1,500 total linear metres.	Yonge and Parliament Street due to physical limitations of on/ off ramps. 4,000 total linear metres.	south sides of Lake Shore Boulevard. 4,400 total linear metres.	
		Pedestrians Summary Ranking	**Less Preferred**	**Moderately Preferred**	**Preferred**	
Cycling	East-West Movement	Length and width of facility	**Less Preferred** – Existing trail is discontinuous and in a poor state of repair. Width of trail varies from 2.5m to 3.0m. Improvements not budgeted under rehabilitation program. Total length of existing facility is 2,200 m in length between Leslie Street and Yonge Street.	**Moderately Preferred** – Physical limitations between Yonge St and Jarvis Street. Total length of existing and proposed facility is 3,690 m in length between Leslie Street and Yonge Street.	**Preferred** – Total length of existing and proposed facility is 4,200 m in length between Leslie Street to Yonge Street.	
		Connectivity with other bikeway facilities <u>*Existing cycling facilities*</u> • *Yonge Street* • *Sherbourne Street* • *Martin Goodman Trail (east of Parliament)* <u>*Planned cycling facilities*</u> • *Trinity Street* • *Cherry Street*	**Less Preferred** – Includes no new cycling facility	**Moderately Preferred** – No connection to existing facility at Yonge Street.	**Preferred.** – New facility can connect with all existing and planned facilities.	
		Cycling Summary Ranking	**Less Preferred**	**Moderately Preferred**	**Preferred**	
Movement of Goods	Vehicle Operations	Change in operations level to truck movement	**Preferred** – Highest overall road capacity		**Moderately Preferred** – New elevated expressway with reduced Lake Shore Boulevard lanes expected to increase travel times through the corridor but to a lesser extent than the Remove alternative.	**Less Preferred** – potential increase in traffic diversion / congestion, particularly during peak periods, may impact goods movement in and around the study area. Goods movement impacts expected to be less during non-peak periods.

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
	Access Opportunity	Change of access levels for commercial/ industrial activities in the study area (turning prohibitions)	**Less Preferred** – Jarvis Street: 4 prohibitions Sherbourne Street: 2 prohibitions	**Moderately Preferred** – Jarvis Street: 2 prohibitions Sherbourne Street: 1 prohibition	**Preferred** – Improved access given elimination of turning prohibitions	
		Movement of Goods Summary Ranking	**Preferred**		**Moderately Preferred**	**Less Preferred**
Safety	Safety Risk for Pedestrians	Traffic exposure for pedestrians at intersections – number of lanes on Lake Shore Boulevard that pedestrians have to cross	**Moderately Preferred** – Maintain and Improve present basically a six lane cross-section, less than Remove, but more than Replace.		**Preferred** – Replace presents the fewest number of lanes for pedestrians to cross.	**Less Preferred** – Remove presents the largest number of lanes for pedestrians to cross.
	Safety Risk for Pedestrians and Cyclist	Number of potential uncontrolled conflict points (e.g., crossing of free flow turns/ ramps) *<u>Existing</u>* *Jarvis – S/B RT; Gardiner Expressway ramp west of Jarvis* *Sherbourne – W/B Gardiner Expressway off ramp; S/B RT* *Cherry (west) – W/B RT; S/B RT* *Cherry (east) – E/B RT; N/B RT* *Don Roadway – N/B RT*	**Less Preferred** – Maintain, Improve and Replace alternatives include more uncontrolled conflict points than Remove. Jarvis – S/B RT; Gardiner Expressway ramp west of Jarvis Sherbourne – none Cherry – none Don Roadway – N/B RT			**Preferred** – Remove eliminates all free flow right turns. While greater volume of traffic will be on an at-grade street, design speed will be lower and road can be designed to accommodate expected volume to meet safety standards.
	Safety Risk for Cyclists and Motorists	Number of Lake Shore Boulevard intersections with road safety concerns *<u>Existing</u>* Lake Shore Boulevard/*Jarvis – short merge for E/B on-ramp* Lake Shore Boulevard/*Jarvis – short diverge for W/B on-ramp*	**Less Preferred** – A number of intersections and road segments along Lake Shore Boulevard have been identified on the City's top 20% list of roadways in need of improvement based on collisions from 2007 to 2011. Road Segments identified on list include: 1) Yonge to Jarvis; 2) Jarvis to Sherbourne; and 3) Don Road to Carlaw. Intersections identified on list include: 1) Jarvis; 2) Sherbourne; 3) Don Road; and 4) Carlaw. Maintain and Improve do not improve the majority of the existing road safety concerns. Existing constraints including free flow ramps and		**Preferred** – Replace and Remove eliminate existing road safety concerns at Jarvis Street, Sherbourne Street, and the Don Roadway.	

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
		Lake Shore Boulevard/*Jarvis – poor sightlines for Gardiner Expressway W/B on-ramp* Lake Shore Boulevard/*Sherbourne – poor sightlines for S/B RT* Lake Shore Boulevard/ *Don Roadway – speed differential for merge between E/B and N/B RT* Lake Shore Boulevard/ *Don Roadway – unexpected conflict between S/B and Martin Goodman Trail*	columns obscuring sight lines on Lake Shore Boulevard. Maintain alternative does not include budget for improvements to Lake Shore Boulevard. Improve alternative does eliminate the southbound right-turn channel on Sherbourne Street.			
	Safety Risk for Motorists on Gardiner Expressway	Gardiner expressway geometry	**Less Preferred** – Gardiner expressway shoulders not to standard	**Preferred** – New Gardiner expressway deck to include full shoulders		**NA**
		Safety Summary Ranking	**Less Preferred**	**Moderately Preferred**	**Preferred**	
Constructability	Duration	Length of construction period *Note: Opportunity to reduce construction periods can be studied, the feasibility and costs of which need to be assessed during the Alternative Design phase of the Environmental Assessment.*	**Preferred –** The City's program is to re-deck this section of Gardiner Expressway in 6 years. Approximately 6 years of direct impact on expressway lanes. Rolling Lake Shore Boulevard lane closures. Given reduction of capacity, traffic delay is anticipated throughout this period although the magnitude of disruption is expected to be less than Replace and Remove.	**Preferred** – Same impact as Maintain. In addition reconstruction of Lake Shore Boulevard will require additional at-grade lane closures. Overall length of construction is expected to be the same.	**Less Preferred –** This is a complex multi-stage project requiring significant pre-stage preparation. Estimated construction period is 8 years involving a multi-stage construction process. Approximately 6 years of direct impact on expressway lanes.	**Moderately Preferred** – It is expected that a 5 to 6 year construction period will be required. Approximately 3 years of direct impact on expressway lanes. 1.5 years per direction. Rolling Lake Shore Boulevard lane closures
	Transportation Management	Potential impact to pedestrian/ cycling infrastructure during construction	**Equally Preferred –** It is assumed that all pedestrian/cycling infrastructure can be largely maintained during construction.			

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
		Capacity to accommodate traffic flows through corridor during construction	**Preferred –** Traffic flows can be accommodated through corridor during construction.		**Less Preferred –** May be periods when traffic flow cannot be accommodated through corridor.	**Moderately Preferred** – Corridor should be available at all times based on the proposed staging scheme.
		Potential off-site traffic disruption during construction	**Preferred –** Least off-site traffic disruption. Some Gardiner Expressway ramps may be affected during some stages.		**Less Preferred –** Major disruption anticipated due to detour routes and pre-construction works.	**Moderately Preferred** – Off-site disruption is expected to be less than Replace as some amount of traffic flow can be maintained through the corridor at all times.
	Construction Impact on Private Property	Potential need for private property for construction staging/ detours	**Preferred –** None expected		**Less Preferred** – Potential private property needs during construction. To be confirmed subject to the development of more detailed design.	
		Potential property/ access disruption during construction	**Preferred –** None expected		**Less Preferred** – Potential, depending on laydown area, casting yard and detour routes.	**Moderately Preferred** – Potential, depending on final detour layout.
		Constructability Summary Ranking	**Preferred**		**Less Preferred**	**Moderately Preferred**
URBAN DESIGN						
Planning	Consistency with Official Plans	Consistent with approved Central Waterfront Secondary Plan principles: 1) Removing Barriers; 2) Building a Network of Spectacular Waterfront Parks and Public Spaces; 3) Promoting a Clean and Green Environment; and 4) Creating Dynamic and Diverse New Communities to support residential and employment growth along the Gardiner/ Lake Shore Boulevard corridor.	**Less Preferred** – Does not achieve the Central Waterfront Secondary Plan principles given existing physical constraints. Improvements at-grade not budgeted under rehabilitation program.	**Less Preferred** –Minimally achieves the Central Waterfront Secondary Plan principles given existing physical constraints and opportunities for improvements.	**Moderately Preferred** – Moderately achieves the Central Waterfront Secondary Plan principles improving north-south crossings, implementation of continues trail, adding park space, and improving the alignment of Lake Shore Boulevard.	**Preferred** – Fully achieves the Central Waterfront Secondary Plan principles improving north-south crossings, implementation of continues trail, adding park space, creating a tree-lined urban boulevard, creating right-of-way infrastructure to support transportation, community and neighbourhood objectives.

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
	Consistency with Precinct Plans	Consistent with approved East Bayfront, Keating, Port Lands, Don Mouth Naturalization, South Riverdale and other plans and land use goals which define standards for high quality and high value urban development.	**Less Preferred** – Consistent with physical plans but does not create a vibrant streetscape to support mixed-use community land uses along the corridor given prioritization of regional expressway infrastructure.			**Preferred** – Consistent with physical plans and creates a vibrant streetscape to support mixed-use community land uses along the corridor.
		Planning Summary Ranking	**Less Preferred**		**Moderately Preferred**	**Preferred**
Public Realm	Streetscape	Quality of place along Lake Shore Boulevard	**Less Preferred** – Intersections with free turns, irregular road geometries, over-scaled fixtures, low-quality finishes, deep shadow, noise amplification, and visual barriers to waterfront destinations create a an unattractive and disorienting environment.	**Less Preferred** – Minimal improvements to intersections with free turns, irregular road geometries, scale of fixtures, and quality of finishes create an only slightly less unattractive and disorienting environment	**Moderately Preferred** – Significant improvements to highway connection design and reduce shadow, noise amplification, obstructed views, and visual barriers to the waterfront.	**Preferred** – Urban boulevard design, familiar road geometries, human-scale fixtures, standard city finishes, full sun exposure, no noise amplification, unobstructed views and clear sight lines to destinations create a comfortable and easily navigable environment
		Consistent and cohesive character from east to west on Lakeshore Boulevard	**Less Preferred** – Varying conditions and widths across the length of the corridor make cohesive character impossible to achieve		**Moderately Preferred** – Varying conditions across the length of the corridor make cohesive character difficult to achieve given expressways connections.	**Preferred** – Consistent conditions and only minor variations in width enable a consistent character to be achieved along the length of the corridor
		Ratio of hardscape to softscape surfaces in the corridor	**Less Preferred** – 90% hardscape, 10% softscape		**Preferred** – 78% hardscape, 22% softscape.	**Moderately Preferred** – 83% hardscape, 17% softscape
	View corridors	Quality of north-south visual connections between downtown and the waterfront	**Less Preferred** – No opportunity to mitigate the visual barrier of the Gardiner columns and elevated deck		**Moderately Preferred** – Fewer columns and higher deck structure minimizes the visual barrier.	**Preferred** – Removes all visual barriers
		Quality of east-west visual connections between the East End and the Financial Core on Lake Shore Boulevard	**Less Preferred** – No opportunity for skyline views from Lake Shore Boulevard. Gardiner structure remains.		**Moderately Preferred** – Minimal opportunities for skyline views from Lake Shore Boulevard. Gardiner structure remains.	**Preferred** – Fully opens up all the skyline views from Lake Shore Boulevard.

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
	Public realm area (acres)	Usable public realm area in new Lake Shore Boulevard public right-of-way dedicated for pedestrian uses, patios, passive recreation, multi-use trails and landscaping.	**Less Preferred –** Improvements not budgeted under rehabilitation program. Approximately 6 acres existing.	**Less Preferred –** Existing constraints allow for some additional public realm area to be created. Approximately 11 acres.	**Moderately Preferred –** Reconstruction of the corridor allows for moderate public realm area to be created. Approximately 13 acres.	**Preferred –** Reconstruction of the corridor allows for most public realm area to be created. Approximately 15 acres.
	Usable park area (acres)	Surplus right-of-way that could be dedicated as City of Toronto park land that would be usable and programmable above existing baseline	**Preferred –** Re-alignment of Lake Shore Boulevard allows for former alignment along Keating Channel, east of Cherry to be converted for use for active sports (e.g., Underpass skate park). Approximately 3 acres.	**Preferred –** Re-alignment of Lake Shore Boulevard allows for former alignment along Keating Channel, east of Cherry to be converted for use for active sports (e.g., Underpass skate park). Approximately 3 acres.	**Moderately Preferred –** Reconstruction of the corridor allows for some land to be dedicated as park land along the rail corridor. Approximately 1 acre.	**Moderately Preferred –** Reconstruction of the corridor allows for some land to be dedicated as park land along the rail corridor. Approximately 1 acre.
	Rail corridor and berm	Length of the CN rail corridor exposed to the public sidewalk and open space along Lake Shore Boulevard	**Less Preferred** – No additional buffering of rail corridor from Lake Shore Boulevard.			**Preferred** – Proposed north side buildings provide a buffer to Lake Shore Boulevard (330 metres buffer Jarvis to east of Sherbourne)
		Public Realm Summary Ranking	**Less Preferred**		**Moderately Preferred**	**Preferred**
Built Form	Street frontage	Length of leasable, active, at-grade space supported by the design of the corridor on Lakeshore Boulevard	**Less Preferred –** Majority of space along the Lake Shore Boulevard corridor will consist of back of house activities such as garages, driveways, service entrances, and building utilities access. Retail opportunities along the corridor will be of low quality and difficult to lease based on comparable sites in the Gardiner/ Lake Shore Boulevard corridor to the west. Total 330 linear metres of frontage (10% of corridor length).		**Moderately Preferred** – Improved expressway infrastructure will improve retail opportunities along Gardiner/ Lake Shore Boulevard corridor and mitigate some negative aspects of the elevated structure. Total 2,160 linear metres of frontage (60% of corridor length).	**Preferred** – Removal of elevated expressway will allow for entire corridor to be developed for retail and active uses. Total 2,920 linear metres of frontage (80% of corridor length).
		Number of podium floors with obstructed views, limited access to light and air and expressway impacts due to proximity of elevated structure	**Less Preferred** – Existing Gardiner height of approximately 10 metres (west of Cherry) and 15 metres (east of Cherry) will negatively impact the lower 4-7 building storeys.		**Less Preferred** – Existing Gardiner height of approximately 15 metres will negatively impact the lower 7 building storeys.	**Preferred** – Removal of Gardiner results in no negative impacts to any north or south facing building storeys.
		Built Form Summary Ranking	**Less Preferred**		**Moderately Preferred**	**Preferred**

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
ENVIRONMENT						
Social & Health	Air Quality	Extent of change in regional air quality (NOx, VOC, & PM2.5)	**Less Preferred** – Modeling results indicate higher regional emissions relative to the other alternatives. Regional burden of 0.25%.			**Preferred** – Modeling results indicate least impact to regional air quality relative to the other alternatives. Regional burden of 0.24%.
		Extent of change in local air quality (NOx, VOC, & PM2.5)	**Less Preferred** – Modeling results indicate the greatest concentration of local emissions relative to the other alternatives. Greatest difference is for NOx and PM2.5.	**Moderately Preferred**– Modeling results indicate a lower concentration of local emissions than the Maintain but a greater concentration of emissions than the Replace and Remove alternatives. Greatest difference is for NOx and PM2.5.	**Preferred** – Modeling results indicate the lowest concentration of local emissions relative to the other alternatives. Greatest difference is for NOx and PM2.5.	
		Level of Greenhouse Gas Emissions	**Less Preferred** – Modeling results indicate the highest levels in GHG emissions relative to the other alternatives. Regional burden of 0.29%	**Moderately Preferred**– Modeling results indicate slightly less GHG emissions than Maintain but a greater concentration of emissions than Remove. Regional burden of 0.28%.		**Preferred** – Modeling results indicate the lowest levels in GHG emissions relative to the other alternatives. Regional burden of 0.24%.
	Noise	Extent of change in noise levels *Note: noticeable differences in the predicted noise levels are mainly for the receptors in close proximity to the Gardiner Expressway/*Lake Shore Boulevard *corridor.*	**Less Preferred** – Alternative results in greatest noise levels for the identified receptors. Local area noise levels range from 69 to 78 dBA.	**Moderately Preferred** – Alternative is predicted to result in slightly lower noise levels for identified receptors than for Maintain alternative. Greatest difference is for alternatives along the Gardiner Expressway/Lake Shore Boulevard corridor. Local area noise levels range from 67 to 78 dBA.		**Preferred** – Alternative is predicted to have the lowest noise levels for identified receptors. Greatest difference is for alternatives along the Gardiner Expressway/lake Shore Boulevard corridor. Local area noise levels range from 61 to 72 dBA.
		Social & Health Summary Ranking	**Less Preferred**	**Moderately Preferred**		**Preferred**
Natural Environment	Terrestrial Environment	Potential to create new terrestrial/ habitat/ natural features	**Less Preferred** – No potential for improvement between Jarvis and Cherry Streets. Minimal improvement through the Keating Channel Precinct as the	**Minimally Preferred** – Limited potential for improvement between Jarvis and Cherry Streets. Reducing the deck of the Gardiner will allow for more light to penetrate the	**Moderately Preferred** – New elevated structure will be higher and have fewer bents/columns therefore allowing more light to penetrate the ground level of	**Preferred** – With no elevated structure through the corridor, opportunities for planting and natural features are greatly increased due to increased sunlight.

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
			relocation of Lake Shore Boulevard will allow for planting and natural features along Lake Shore Boulevard and the Keating Channel.	ground level of Lake Shore Boulevard. This increases the potential for planting and natural features. Minimal improvement through the Keating Channel Precinct as the relocation of Lake Shore Boulevard will allow for planting and natural features along Lake Shore Boulevard and the Keating Channel.	Lake Shore Boulevard. This increases the potential for planting and natural features.	
	Aquatic Environment	• Potential to create new aquatic habitat	**Equally Preferred** – Relocation of Lake Shore Boulevard through Keating Channel Precinct will allow for improved runoff control into the Keating Channel. This will provide for some improvement of aquatic habitat in the Keating Channel. All solutions to utilize new Don River crossing proposed in Don Mouth Naturalization Project.			
	Water Quality	• Ability to treat stormwater on-site/at source	**Less Preferred** –. Through Keating Channel Precinct the new Lake Shore Boulevard alignment could be designed to improve treatment of stormwater and water quality.		**Preferred** – Provides the greatest amount of new ground surface with the reduction of Lake Shore Boulevard lanes. This presents the greatest opportunity for source controls/ground infiltration.	**Moderately Preferred** – redesigning the entire roadway at grade allows for the potential to integrate stormwater management and water quality features that are not available unless the road is reconstructed.
	Water Quantity	• Area of paved surface (higher number equates to more surface water run-off)	**Less Preferred –** 125,074 sq. m.	**Moderately preferred** – 114,010 sq. m.	**Preferred** – 91,095 sq. m	**Preferred** – 84,575 sq. m.
	Microclimate	• Access to natural sunlight in the corridor	**Less Preferred** – Least amount of natural light access to street level west of Cherry Street.	**Minimally Preferred** – Reducing the deck of the Gardiner will allow for more light to penetrate the ground level of Lake Shore Boulevard west of Cherry Street.	**Moderately Preferred** – New elevated structure will be higher and have fewer bents/columns therefore allowing more light to penetrate the ground level of Lake Shore Boulevard.	**Preferred** – With no elevated structure through the corridor there is full access to sunlight.
	Tree-Lined and Shaded Street	• Tree Canopy coverage. Encourages active transportation. Reduces urban heat island effect, improve air quality, increase evapotranspiration.	**Less Preferred** – Minimal potential for tree canopy improvement between Jarvis and Cherry Streets (35 new trees estimated – 1% coverage in corridor). Relocation of Lake Shore Boulevard out from under the elevated structure	**Moderately Preferred** – Some improved opportunity for new trees west of Cherry Street and east of Cherry along new Lake Shore Boulevard alignment. (133 new trees estimated – 6% coverage in corridor).	**Moderately Preferred** – New elevated structure will be higher, have fewer bents/columns and be narrower therefore allowing more light to penetrate the ground level. This increases the potential for a tree canopy along	**Preferred** – With no elevated structure through the corridor, opportunities for tree planting are greatly increased due to increased sunlight which will result in the greatest tree canopy. (1,237 new trees estimated providing 52%

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
			through Keating Channel Precinct provides for increased opportunity for a tree canopy along the road corridor but not included as part of this alternative.		the corridor. Removal of Gardiner Expressway along Keating channel opens up that area for new tree plantings. (371 new trees estimated providing 16% coverage in corridor).	coverage in corridor).
		Natural Environment Summary Ranking	**Less Preferred**		**Moderately Preferred**	**Preferred**
Cultural Resources	Built Heritage	Direct impact on built heritage features	**Equally Preferred:** Based on available documentation, no built heritage features within existing or proposed right-of-way. Pending completion of a heritage assessment, the existing Gardiner Expressway should be considered a potential built heritage feature.			
	Cultural Landscape	Direct impact on cultural landscapes	**Equally Preferred:** Based on available documentation, no cultural landscapes within or adjacent to the existing or proposed right-of-way. Pending completion of a heritage assessment, the existing Gardiner Expressway corridor should be considered a potential cultural landscape.			
	Archaeology	Potential for impact on archaeological resources *Note all alternatives result in impact from New Lake Shore Boulevard alignment east of Cherry. Potential effects on three archaeological features:* • Toronto Dry Dock • Toronto Iron Works • British American Oil	**Preferred** – No additional impacts.	**Preferred–** minor disturbances possible from: Shift Jarvis Off-ramp 50m East – Potential effects on one archaeological feature: • Knapp's Roller Boat Widen Westbound Gardiner off Ramp (Relocate Piers) East of Sherbourne – Potential effects on one archaeological feature: • circa 1910-1926 City Corporation Wharf	**Less preferred –** Greatest amount of excavation results in increased potential for disturbance to known features. Potential effects on 9 archaeological wharf related features: • circa 1893-1925 Yonge Street Wharf • circa 1893-1925 City Wharf • circa 1893-1925 Toronto Electric Light Co. wharf • circa 1870 Don Breakwater • circa 1900 Don Mouth Fill Limit • circa 1910-1926 Polson Iron Works Wharf • circa 1910-1926 City Corporation Wharf • Knapp's Roller Boat • National Iron Works	**Moderately Preferred** – while this alternative generally overlaps with the same features as the Replace, less excavation would be required and thus there is less potential for archaeological impacts
	First Nation People and Activities	Potential impact on lands used for traditional purposes	**Equally Preferred:** No impact anticipated. Previous 19th and 20th century developments have removed features related to traditional uses of lands by Aboriginal peoples.			

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
		Cultural Resources Summary Ranking	**Preferred**		**Less Preferred**	**Moderately Preferred**
ECONOMICS						
Regional Economics	Regional Competitiveness	Potential change in Regional competitiveness	**Equally Preferred** – All alternatives are not expected to have an influence on the regional economy. A number of case studies were reviewed including cities that have removed, never had, or continue to have a through expressway in their downtown. There are no indicators that indicate the cities competitiveness at a regional level is tied to expressway infrastructure. Other factors such as access to talent and success of specialized industries are overall more important to a cities competitiveness.			
	Post Construction Congestion	Potential net economic impacts of post construction congestion	**Equally Preferred** – Post Construction Congestion Costs were reviewed and considered. The cost of congestion for auto users under each of the alternatives was estimated. The level of difference in congestion cost between the Maintain and Remove alternatives was considered to be insignificant from a regional perspective (a maximum difference of $200K in comparison to a 2031 projected congestion cost of $2.8 billion for the City of Toronto. The Improve and Replace alternatives would have congestion cost differences less than this amount. As such, all the alternatives were ranked equally. *Note: Post Construction Congestion Costs are defined separately from Construction User Costs. Construction User Costs is an accepted industry analysis tool to compare different construction implementation methods and their relative impact on drivers during construction. The Construction User Cost figure is used as one evaluation metric in the decision making process. Mitigation of Construction User Costs can include schedule acceleration which may have cost premiums.*			
		Regional Economics Summary Ranking	**Equally Preferred**			
Local Economics	Business Activity	Number of potential new jobs in corridor and/or study area	**Less Preferred** – 0 jobs		**Moderately Preferred** – 1,810 jobs	**Preferred –** 2,120 jobs
	Visitor/Tourism Attractiveness	Potential change in visitor/tourism attractiveness of waterfront.	**Less Preferred** – No change over existing condition regarding visitor/tourism attractiveness.		**Moderately Preferred** – Moderate opportunities to improve base case.	**Preferred** – Removal of the elevated structure will open up views and vistas and create a signature boulevard that would become a gateway to the waterfront. Active street frontages and retail would increase foot traffic and foster an environment for visitors and tourist to spend more time on the waterfront and increase economic activity locally.

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
	On Street Parking	Ability to provide on-street parking *(All options allow for off-peak period parking on Lake Shore Boulevard in the Keating Channel Precinct)*	**Less Preferred** – No opportunities for off-peak parking along Lake Shore Boulevard with the exception of the re-alignment Lake Shore Boulevard segment between Cherry and Don River given existing constraints and associated view corridors.		**Preferred** – Street could be designed for off-peak parking along Lake Shore Boulevard to support retail along the corridor.	
		Local Economics Summary Ranking	**Less Preferred**		**Moderately Preferred**	**Preferred**
Direct Cost & Benefit	Capital Cost and Funding	Total capital cost (in 2013$)	$350 million (2013$) • Includes City approved deck replacement of $215 million plus costs for additional works to enable comparison with the other alternatives (ramp structures, Don River Bridge, Lake Shore Boulevard east to Logan, Don Roadway improvements, Engineering costs)	$410 million (2013$) • Includes basic intersection improvements along Lake Shore Boulevard, additional urban design and landscaping improvements and Lake Shore Boulevard reconstruction • Cost allows for the reconstruction of 10 deck support bents to facilitate intersection improvements	$970 million (2013$) • Includes complete replacement of both the Gardiner deck plus Lake Shore Boulevard from Jarvis to Carlaw and major urban design and landscaping throughout • Cost allows for complete replacement of the deck and support infrastructure (bents) with major construction staging and detour costs • New deck is approximately 15 m in height	$330 million (2013$) • Includes demolition and removal of the existing Gardiner Expressway and 8-lane Lake Shore Boulevard construction and major urban design and landscaping throughout • Includes construction of new bridge structures across Don River to connect to Lake Shore Boulevard and Don Valley Parkway
		Property acquisition	• No property requirements.	• Minimal property requirements around the Don Roadway/DVP connection.	• Minimal property requirements around the Don Roadway/DVP connection.	• Minimal property requirements around the Don Roadway/DVP connection. • Assumed that the southern sidewalk area through RoW width restricted area can be accommodated with building set back area (7m) so no property purchase is assumed to be required.

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
		Funding availability	$212.7 million (2013$) for Gardiner Rehabilitation Program (Jarvis to DVP Ramps) $105 million (2013$) for Gardiner Rehabilitation Program – Transition Areas: 1) Yonge to Jarvis; and 2) DVP/ Logan Ramps			
	Lifecycle cost	100 year life cycle cost (includes total capital cost + 100yr operations and maintenance cost) *Maintain figures are +/- 10%, All others +/- 20%	$870 million (2013$) $300 million (NPV)	$865 million (2013$) $360 million (NPV)	$1,390 million (2013$) $700 million (NPV)	$470 million (2013$) $240 million (NPV)
	Land Value Creation	Public Land disposition proceeds. All figures +/- 10%	$0	$3 million (2013$) $2 million (NPV)	$145 million (2013$) $68 million (NPV)	$230 million (2013$) $85 million (NPV)
		Direct Cost and Benefit Summary Ranking (2013$ and NPV)	**Moderately Preferred** $870 million (2013$) Net Cost $300 million (NPV) Net Cost	**Moderately Preferred** $862 million (2013$) Net Cost $358 million (NPV) Net Cost	**Less Preferred** $1,245 million (2013$) Net Cost $632 million (NPV) Net Cost	**Preferred** $150 million (2013$) Net Revenue $155 million (NPV) Net Cost
Study Goals Achievement						
Revitalize the Waterfront			No	No	Partially	Yes
Reconnect the City with the Lake			No	Partially	Partially	Yes
Balance Modes of Travel			No	No	Partially	Yes
Achieve Sustainability			No	No	No	Yes
Create Value			No	Partially	Yes	Yes

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
SUMMARY			The scope of Maintain is based on the City's elevated structure rehabilitation program and transition areas that have been added to make this alternative comparable to the other alternatives under consideration. The Maintain alternative solution continues as a single purpose regional transportation corridor and does not include infrastructure improvements for local transportation access and support of significant waterfront population and employment growth.	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 LAKE SHORE BOULEVARD 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.
EVAUATION RESULTS			Not Preferred	Not Preferred	Not Preferred	Preferred

Criteria Group Ranking Summary

Table 4.3 provides a summary of the alternatives preference ranking by criteria group.

Table 4.3: Summary Evaluation Table

Preference Ranking Code

Preferred ● Moderately Preferred ◐ Least Preferred ○

Study Lens / Criteria Group	MAINTAIN	IMPROVE	REPLACE	REMOVE
TRANSPORTATION & INFRASTRUCTURE				
Automobiles	●	◐	◐	○
Transit	●	●	●	●
Pedestrians	○	◐	●	●
Cycling	○	◐	●	●
Movement of Goods	●	●	◐	○
Safety	○	◐	●	●
Constructability	●	●	○	◐
URBAN DESIGN				
Planning	○	○	◐	●
Public Realm	○	○	◐	●
Built Form	○	○	◐	●
ENVIRONMENT				
Social and Health	○	◐	◐	●
Natural Environment	○	○	◐	●
Cultural Resources	●	●	○	◐
ECONOMICS				
Regional Economics	●	●	●	●
Local Economics	○	○	◐	●
Direct Cost and Benefits	◐	◐	○	●

Preferred  Moderately Preferred  Least Preferred 

Study Lens/ Criteria Group	MAINTAIN	IMPROVE	REPLACE	REMOVE
Study Goals Achievement				
Revitalize the Waterfront	No	No	Partially	Yes
Reconnect the City with the Lake	No	Partially	Partially	Yes
Balance Modes of Travel	No	No	Partially	Yes
Achieve Sustainability	No	No	No	Yes
Create Value	No	Partially	Yes	Yes

Discussion of Alternative Trade-offs by Criteria Group

The following discussion presents a detailed review of the results found in **Table 4.2**.

Transportation and Infrastructure

Under this criteria group, the potential influences of the alternatives on all modes of transportation were considered, including: automobile, transit, cycling and walking. Also considered is the potential for impact on safety and goods movement. An extensive amount of Transportation modelling work was undertaken to provide data to inform the impact on travel auto times as explained further below. Construction related issues including duration and impact on commuters were also considered.

Automobiles

This criteria group considered three criteria: 1) Commuter Travel Time based on average AM peak hour auto in-bound travel times for select origin-destination (OD) pairs; 2) Impact on Average Auto Travel Time based on average AM peak hour auto travel times within the transportation study area (roughly bounded by Spadina, Dundas, Woodbine and Lake Ontario); and 3) Road Network Flexibility/Choice represented by the number of turning prohibitions.

The modelling results indicate that for the select OD pairs, the Improve and Replace alternatives had similar or up to 5 min greater Average AM park hour Travel Times than the Maintain alternative. The Remove alternative was typically expected to result in 5 to 10 min greater Average AM peak hour Travel Times as compared to the Maintain alternative. As such, Improve and Replace were ranked *less preferred* than Maintain, and Remove was ranked *least preferred* for this criterion.

Travel Times were also examined for travel in the AM peak hour (both directions) within the Transportation Study Area (Downtown). While the rankings of the alternatives for this criterion generally mimic those for the OD pairs (City-wide), this analysis provided information on the volume of automobiles affected. The Improve and Replace alternatives had no increased Travel Times greater than 7 min (over the Maintain). For the Remove alternative, 5% of vehicles were projected to experience a greater than 7 min increase in Travel Time within the Transportation Study Area.

The final criterion considered in this criteria group was Road Network Flexibility/ Choice which was represented by the measure “Turning Prohibitions at Key Intersections”. The Replace and Remove alternatives were ranked preferred as they would result in the fewest number of turn restrictions.

Considering the rankings for the three criteria in this criteria group, the Maintain alternative was identified as preferred due to its lowest Travel Times, the Improve and Replace alternatives

were ranked as moderately preferred and the Remove alternative was ranked as least preferred with the highest Travel Times.

Transit

This criteria group has one criterion: Transit Impact, which includes three measures: Impact on Existing Streetcars, Impact on Subway Service, and Ability to Accommodate Planned Transit Service. The Maintain alternative as the base case was preferred. In regards to the first measure, the impacts of the alternatives on Streetcar Travel Times were modelled using PARAMICS within the Transportation Study Area along Dundas, Queen and King Streets. The Improve alternative was considered moderately preferred with a slight increase in some of the Travel Times for some Streetcar routes. Modelling results show that the Replace and Remove alternatives would result in a 1 to 4 min increase in Streetcar Travel Times and are thus ranked less preferred than the other alternatives.

None of the alternatives were expected to result in impact on Subway Service and thus were ranked as equal for this measure.

In terms of the impact of the alternatives on Planned Transit Service, the Replace and Remove alternatives were ranked preferred over Maintain and Improve, as the removal of the Gardiner east of the Don River is expected to better accommodate Planned Transit Service in this area (e.g., Broadview streetcar extension).

Considering the preference rankings for these measures, the alternatives were considered equally preferred for the Transit criteria group.

Pedestrians

For the Pedestrian criteria group, two criteria were considered: North-South Sidewalks and East-West Sidewalks. In regards to North-South Sidewalks, three measures were considered. The first examined the dimension and condition of sidewalks. The Replace and Remove were ranked as preferred as reconstruction of the corridor allows for Sidewalks to be built to City standards along the entire length of Lake Shore Boulevard. Improve was ranked moderately preferred as Sidewalk improvements are not possible at all north-south crossings. Finally, the Maintain alternative was less preferred as existing sidewalks are substandard along north-south streets.

The second measure considered Crossing Points. The Replace and Remove were ranked preferred as the reconstruction of the corridor allows for city standard crosswalks to be built on both the east and west side of the street. The Improve was ranked less preferred as improvements and standardization is possible at a number of intersections but not all. Existing constraints did not allow standardization of crosswalks on both the east and west side of the

street for all intersections. Maintain was ranked less preferred as existing constraints did not allow standardization of crosswalks on both the east and west sides of the street and improvements were not been budgeted under the rehabilitation program.

Finally, the third measure under the North-South Sidewalks criterion measured Crossing Distances. The Replace alternative was ranked as preferred as it has the smallest average intersection Crossing Distance at 26.1 m and could be crossed in one stage. The Improve and Remove alternatives were ranked moderately preferred with average Crossing Distances of 33.7 m and 32.4 m, respectively. Finally, the Maintain alternative is ranked less preferred with an average intersection Crossing Distance of 36.9 m.

The second criterion, East-West Sidewalks, considered one measure related to the dimension and condition of sidewalks: "Ability to physically implement City standard east-west sidewalks as measured by length along the corridor for use by the local community and travelers." The Replace and Remove alternatives were preferred as reconstruction of the corridor allows for sidewalks to be built to City standards along the entire length of Lake Shore Boulevard for use by both the local community and travelers on the north and south sides of Lake Shore Boulevard. In total, 4,400 total linear metres of sidewalk are possible. The Improve alternative was moderately preferred as sidewalks on the north side of Lake Shore Boulevard are not possible between Yonge Street and Parliament Street due to physical limitations of on/ off ramps. In total, 4,000 total linear metres of sidewalks are possible. The Maintain alternative was less preferred as existing sidewalks are sub-standard and/ or not existing in parts of the corridor and improvements were not budgeted under the existing Gardiner rehabilitation program. Re-alignment of Lake Shore Boulevard in the Keating Channel Precinct allowed for sidewalks on both the north and south side for all alternatives that would provide 1,500 total linear metres of sidewalk.

Overall, for the Pedestrian criteria group, The Replace and Remove alternatives were ranked as preferred as they accommodate new North-South and East-West Sidewalks and involved shorter Crossing Distances of Lake Shore Boulevard. The Improve alternative was ranked moderately preferred as it provided improved North-South and East-West Sidewalks, but also involved a greater Lake Shore Boulevard Crossing Distance. The Maintain alternative was ranked *less preferred* as it provided limited sidewalks and involves the longest Lake Shore Boulevard. Crossing Distances (measured at Jarvis Street).

Cycling

This criteria group had one criterion, East-West Movement, and included two measures: Length and Width of Facility, and Connectivity with Other Bikeway Facilities. For Length and Width, the Maintain alternative was ranked less preferred with a total length of existing trails in the

corridor of 2,200 m. The Improve was moderately preferred as it allowed for a facility of 3,690 m in Length and which would extend as far west as Jarvis Street The Replace and Remove alternatives were preferred as they allowed for a new cycling facility that could extend as far west as Yonge Street and would have a total Length of 4,200 m.

The second measure considers Connectivity of the new north side east-west cycling facility with other existing and planned cycling facilities. The Maintain alternative included no new facility so was least preferred. The Improve alternative included connections with all facilities except Yonge Street and was ranked as moderately preferred. Finally, the Replace and Remove alternatives were ranked as preferred as the new cycling facility could connect with all existing and planned cycling facilities.

Considering the preference rankings for these two measures, for the Cycling criteria group, Replace and Improve were both ranked as preferred, Improve was ranked moderately preferred, and Maintain was ranked as less preferred.

Movement of Goods

This criteria group included two criteria: Vehicle Operations and Access Opportunity. Vehicle Operations considered the potential for changes in truck vehicle operations levels. Available road capacity was used as a surrogate measure for this. For this criterion, Maintain and Improve were ranked as preferred as they provide the most road capacity. Replace was ranked as moderately preferred as it provides slightly less road capacity, and Remove was ranked less preferred as it reduces road capacity further. It is noted that this is a measure of effect during the peak periods of road usage. Truck Vehicle Operations were not expected to be significantly affected for non-peak periods which represent the greatest portion of a 24-hour period.

The second criterion, Access Opportunity, was measured by the extent of Turning Prohibitions in the corridor. Turning Prohibitions could affect access levels for the movement of goods. Maintain had the most Turning Prohibitions (6 in total) and was ranked less preferred. Improve had fewer Turning Prohibitions (3) and was ranked moderately preferred. Replace and Remove had no or a limited number of Turning Prohibitions and were preferred.

The preference rankings for the two criteria were generally opposite to each other. Maintain/Improve were preferred for Vehicle Operations and less preferred for Access Opportunity, whereas the rankings for Replace/Remove were the reverse. If the Vehicle Operations criterion was considered to be a more important measure of potential impact on goods movement, then Maintain/Improve were ranked as *preferred*, Replace as *moderately preferred* and Remove as *less preferred*.

Safety

The Safety criteria group included four criteria: Safety Risk for Pedestrians, Safety Risk for Pedestrians and Cyclists, Safety Risk for Cyclists and Motorists, and Safety Risk for Motorists on the Gardiner. For Safety Risk for Pedestrians, the number of lanes at intersection crossing points was used as a measure. The Replace alternative, with a 4-lane crossing section, was preferred. The Maintain/Improve alternatives both had a 6-lane crossing section and were ranked moderately preferred. The Remove with an 8-lane crossing section was ranked less preferred.

For the criterion Safety Risk for Pedestrians and Cyclists, the number of potential uncontrolled conflict points was measured. Uncontrolled conflict points included free flow turns, ramps, etc. The Remove alternative was ranked as preferred as it eliminated all free flow right turns. While greater volume of traffic would be on an at-grade street, design speed would be lower and the new road could be designed to accommodate expected volume to meet safety standards. The other alternatives were all ranked less preferred as they included more uncontrolled access points.

For the Safety Risk for Cyclists and Motorists criterion, there were several existing safety concerns within the corridor that were considered. Replace and Remove were ranked as preferred as they eliminated existing road safety concerns at Jarvis Street, Sherbourne Street, and the Don Roadway. Maintain and Improve would not improve the majority of the existing road safety concerns, although the Improve alternative eliminated the southbound right turn channel on Sherbourne Street. These two alternatives were therefore ranked as less preferred.

Finally, for the criterion Safety Risk for Motorists on the Gardiner expressway (referred to as FGE in the evaluation table), Maintain was considered to be less preferred as it would still result in sub-standard shoulders along the Expressway. The Improve and Replace alternatives provided improved shoulders along the expressway and were preferred.

Considering the above criteria/ measure preference rankings, the Replace and Remove alternatives were ranked as preferred for the Safety criteria group as they were ranked preferred for three of the four criteria. The Replace alternative was ranked preferred for: Safety Risk for Pedestrians, Safety Risk for Cyclists and Motorists, and Safety Risk for Motorists on the Gardiner. The Remove alternative was ranked preferred in regards to: Safety Risk for Pedestrians and Cyclists, Safety Risk for Cyclists and Motorists, and Safety Risk for Motorists on the Gardiner. The Improve alternative was ranked moderately preferred as the safety improvements were less substantial than for Replace and Remove. Maintain was ranked overall as less preferred as it generally resulted in a higher Safety Risk to all users of the corridor.

Constructability

The Constructability criteria group included three criteria: Duration, Transportation Management, and Construction Impact on Private Property. Maintain and Improve were ranked as preferred for Duration. While the expected Duration of construction for Maintain and Improve was not substantially less than the other alternatives, they generally are expected to have a lower magnitude of disruption. Remove was ranked as moderately preferred and Replace as less preferred as Replace had the longest multi-stage construction period. The Duration of construction for Remove would have a greater impact on lane closures than Maintain and Improve but would not be as complex as Replace.

In regards to Transportation Management, the evaluation considered the impact to pedestrians and cyclists, traffic flows and off-site traffic disruption. Maintain and Improve were ranked as preferred for this criterion. They would both result in the least amount of traffic disruption and no road detours are anticipated. Remove was ranked as moderately preferred as the proposed staging scheme would allow access to the corridor throughout the construction period but there would be some impacts off-site to support traffic flow. Replace was ranked as less preferred as it had the greatest impact on Traffic Management with periods when traffic flow cannot be accommodated through the corridor and would be required to detour.

Finally, for Construction Impact on Private Property criterion, the evaluation considered two measures: impacts on land for staging and detours and impacts to private property access. Maintain and Improve were again ranked as preferred with no impact to private property expected. Remove was ranked moderately preferred as it would have some potential private property access impacts and had the potential to require some private property during construction. The Replace alternative was ranked as less preferred as it had the potential to require some private property during construction as well as required more land for laydown areas, yards and detour routes during construction. For both Remove and Replace the Construction Impact on Private Property would be confirmed during the development of the more detailed design.

Overall, the Maintain and Improve alternatives were ranked *preferred* for this criteria group.

Urban Design

In recent years the City and Waterfront Toronto have made great strides in defining and investing in the best of Urban Design character for the next generation of waterfront precincts. The evaluation of alternative solutions has considered what ways changes in the Gardiner East corridor might reinforce that vision.

Planning

The Planning criteria group analyzed the relationship of Gardiner alternatives to the key policy documents defining urban design intent for the waterfront. As such, the criteria group considered two criteria: Consistency with Official Plans, and Consistency with Approved Precinct Plans. Consistency with Official Plans examined the extent to which each alternative is consistent with the principles that make up the Council-approved *Central Waterfront Secondary Plan* (CWSP). The core principles included "Removing Barriers/Making Connections", "Promoting a Clean Green Environment", and "Transforming Lake Shore Boulevard into an Urban Waterfront Avenue". Maintain and Improve were ranked less preferred for this criteria as they did little to achieve the CWSP principles. Replace was ranked moderately preferred as it proposed a plan that would progress the goals of the principles by improving north-south crossings, adding some green space, and improving the alignment of Lake Shore Boulevard. Remove was ranked preferred as it fully achieved the CWSP principles by removing the visual barrier of the elevated expressway structure, fully regularizing north-south crossings, creating a tree-lined urban boulevard, and transforming the area with an “urban waterfront avenue” as described in the CWSP.

Consistency with Precinct Plans examined the extent to which each alternative is consistent with the goals of the approved East Bayfront and Keating Channel precinct plans. Maintain, Improve and Replace were all ranked as less preferred for this criterion/measure. This was because although they allowed the precinct plans to be achieved, they do not support the development of the highest value of land uses adjacent to Lake Shore Boulevard. This was primarily due to the continued presence of an elevated structure through the corridor. Remove was ranked as preferred for this measure as it was consistent with physical plans for the precincts and in addition it most successfully met the plan definitions of high quality and high value design for the land uses along Lake Shore Boulevard.

Overall for the Planning criteria group Remove was preferred as it reflected longstanding Waterfront design aspirations and created the greatest opportunity to transform the corridor into a green, pedestrian and inviting place that would also result in positive effects to adjacent development parcels. Replace was moderately preferred as it encouraged some improvement to study area in accordance with the planning documents, while Maintain and Improve were less preferred as they did not contribute to advancing the plans for the study area.

Public Realm

The Public Realm criteria group considered five criteria: 1) Streetscape, 2) View Corridors, 3) Public Realm Area, 4) Useable Park Area and 5) Rail Corridor and Berm.

The Streetscape criterion considered the quality, consistency and character of the streetscape along Lake Shore Boulevard. Maintain and Improve were ranked less preferred for Streetscape as there were limited modifications being made at grade for these alternatives and therefore little chance to enhance the quality of the environment or provide a consistent character along Lake Shore Boulevard. There would be improvements to Streetscape through the Keating Channel Precinct with the relocation of Lake Shore Boulevard away from the Keating Channel and the balancing of the realigned section of the roadway with pedestrian realm as per the Keating Channel Precinct Plan. However, the Streetscape conditions between Jarvis Street and Cherry Street would see little transformation from either alternative. For Maintain there would continue to be confusing road geometries, over-scaled fixtures, low-quality finishes, deep shadows with poor visibility, noise amplification, visual barriers to the city and to waterfront destinations, and extensive hard surfaces (paving and concrete) with minimal landscaping along Lake Shore Boulevard.

The Improve alternative presented minimal advances over the Maintain condition, although there would be some improvements to crossings, road geometries and landscaping of Lake Shore Boulevard.

Replace was ranked as moderately preferred and Remove as preferred for the Streetscape criterion. This is a reflection of the improved Streetscape condition that Replace presented over Maintain and Improve and the full achievement of an urban boulevard design for Remove. Replace presented a narrower roadway at grade for Lake Shore Boulevard which offered opportunities for softscape landscaping that offsets the hardscape of the paved roadway. Remove presented human-scale fixtures, standard city finishes, full sun exposure, no noise amplification (as the structure would be removed), unobstructed views and clear sight lines to destinations to create a comfortable and easily navigable environment. The character of the urban boulevard presented under Remove would be consistent throughout the study area with only minor variations as the width of the corridor requires. Replace also relocated the new elevated expressway away from the Keating Channel to align with the new alignment of Lake Shore Boulevard.

This opened up development and public realm opportunities along Keating Channel. However, from a Streetscape perspective, the realigned Lake Shore would have the new elevated expressway above it which would reduce opportunities for streetscaping Lake Shore Boulevard through the Keating Channel Precinct. For Remove, there would no longer be an elevated structure, which would result in opportunities for development along Keating Channel as well as a greatly enhanced streetscape for the new urban boulevard. Together these elements resulted in Remove as preferred for streetscaping.

For the View corridors criterion, Maintain and Improve were ranked less preferred as they provided no opportunities to enhance Lake Shore Boulevard-level views of the city skyline or waterfront as the dominant visual mass of the Gardiner Expressway structure remains in the corridor. Replace provided some improved view corridors as the expressway structure is higher and there would be fewer supporting columns blocking views. However, the elevated structure would still exist in Replace and therefore it was ranked as moderately preferred. Remove provided the greatest opportunity to open up views from downtown and neighbourhoods to the Lake and along the full corridor with the removal of the elevated structure and was ranked as preferred to address view corridors.

The Public Realm Space criterion considered the area of land dedicated to passive and active public open space uses such as space for multiuse paths, landscaping, parks and plazas. Maintain and Improve were less preferred with little enhancement for Public Realm Space as there would still be a significant area of land required for the road infrastructure, including ramps and supporting structures for the elevated expressway. Replace is moderately preferred as it allows for new Public Realm to be created. This would be a result of building an expressway that required significantly less footprint for columns and ramps while also providing a reduced number of lanes on Lake Shore Boulevard. Remove provided the greatest useable public realm area. Remove was preferred as it frees up the most usable publicly owned land for an improved Public Realm and potential north-side development parcels. These would be opened up as a result of removing all of the infrastructure supporting the elevated expressway.

The Usable Park Area criterion considered the surplus right-of-way that could be dedicated as City of Toronto park land that would be usable and programmable above the existing park area (which is limited). Remove and Replace were moderately preferred for this criterion. Both alternatives allowed for some new Park Area to be dedicated along the rail corridor. Maintain and Improve were preferred, although they did not open up as much new land for development, the re-alignment of Lake Shore Boulevard allowed for the use of the former alignment along the Keating Channel, east of Cherry Street, to be converted for use with active recreation and sports courts (e.g., Underpass skate park).

Finally, under the Public Realm criteria group was the Rail Corridor and Berm criterion. This criterion examined the opportunity for the alternatives to reduce the exposure of pedestrians to the Rail Corridor while using public sidewalks and open spaces along Lake Shore Boulevard. The Remove was ranked as preferred for this criterion and all other alternatives were ranked as less preferred. This was due to the limited ability for Maintain, Improve, or Replace to mitigate the Rail Corridor. The current Rail Corridor is elevated and includes a berm that is owned by

Metrolinx. Although some landscaping could be provided to enhance the at-grade condition, it would do little to buffer the Rail Corridor and would have to be very significant in size to reduce the visibility and noise from the Rail Corridor. Remove provided the only opportunity to alter the exposure of the Rail Corridor to pedestrians. This was due to the Remove plan proposal to include development on the north side of Lake Shore Boulevard. The alignment of the new urban boulevard in Remove would allow enough space for north-side buildings between Jarvis and Sherbourne Streets. This would reduce exposure to the Rail Corridor along Lake Shore Boulevard.

Overall, Remove ranked as preferred for the Public Realm criteria group as it achieved the greatest benefits related to the Streetscape, View Corridors, Public Realm Space, and Rail Corridor and Berm criteria/ measures. Replace was ranked as moderately preferred and Maintain and Improve were ranked as less preferred.

Built Form

The consideration of Built Form related to the varied opportunities offered to achieve an urban character defined by attractive urban structures that frame lively urban places and promenades along efficient movement corridors. The assessment focused on the opportunities for leasable, active, at-grade space supported by the design of the corridor as well as the number of podium floors for development fronting on Lake Shore Boulevard with obstructed views and limited access to light and air due to the elevated structure.

Maintain and Improve were ranked less preferred for Street Frontage as they both offered no increase in active building fronts at grade. The presence of the existing elevated structure in both of these alternatives also impacted the quality of space for the lower three floors of the podiums for the developments fronting on Lake Shore Boulevard. Replace was moderately preferred as it advanced the corridor in terms of the quantity of building fronts that would be expected to have active at-grade uses. This would be due to the improved pedestrian and public space available at grade to support an active pedestrian street in Replace. Remove was preferred and presented the greatest benefit to the corridor in terms of Built Form as a result of removing the elevated expressway and opening the full corridor to light, air and views and building a green urban boulevard. Remove would result in the greatest amount of leasable, active, at-grade building space fronting onto Lake Shore Boulevard. As the new boulevard would consist of a two-sided street it would provide activity on both sides of Lake Shore Boulevard. Remove also eliminated the physical barrier of the elevated expressway in front of the development blocks. The podiums would not be impacted by an elevated structure and would have full access to light and air from all storeys.

Considering the above preference rankings, Maintain and Improve were ranked less preferred, Replace as moderately preferred, and Remove was most preferred for the Built Form criteria group.

Environment

Social and Health

Two criteria were included as part of this criteria group: Air Quality and Noise. Regarding the Air Quality criterion, three measures were included: the Extent of Change in Regional Air Quality, Extent of Change in Local Air Quality, and Level of Greenhouse Gas Emissions. Air Quality modelling was undertaken following provincial methodologies using the MOBILE 6.2C model. The Air Quality modelling work used the future transportation volumes/patterns associated with each of the alternatives as developed by the PARAMICS transportation model. Total vehicle kilometres travelled and average vehicle speeds were considered in the analysis.

Extent of Change in Regional Air Quality considered several parameters, including NOx, VOC, and PM2.5. The "region" considered in this analysis was the Transportation System Study Area, which includes the lands extending from Dundas Street to Lake Ontario and from Spadina Avenue to Woodbine Avenue. The Regional Air Quality contribution from vehicles under the Maintain, Improve and Replace alternatives were determined to be similar (each contributing 0.25% of the regional air emissions contribution). The greatest difference among the alternatives was for NOx and PM2.5. The results of this analysis indicated that the Remove and Replace alternatives were predicted to have the lowest air emissions for the local area receptors and were preferred. The Improve alternative was ranked moderately preferred and the Maintain alternative was ranked less preferred.

The final measure considered the Level of Greenhouse Gas (GHG) Emissions. A regional burden analysis (GHG regional contribution by the alternative) was completed for a 24 hr. period. The Remove alternative was ranked as preferred with the lowest regional GHG emission contribution of 0.24%. The Improve and Replace alternatives were ranked moderately preferred with a regional emission contribution level of 0.28%. The Maintain alternative was ranked less preferred with a slightly higher regional burden contribution of 0.29%.

Similar to Air Quality, Noise Levels were modelled considering the traffic outputs of the PARAMICS model. The measure used to assess the Noise criterion was the Extent of Change in Noise Levels. Noise modelling was completed following Ministry of Transportation endorsed methodology using the ORNAMENT noise model. Over 150 receptor points were modelled. Based on the modelled results, Remove was predicted to have the lowest Noise Levels for identified receptors with local area Noise Levels ranging from 61 to 72 dBA and was ranked as preferred. The Improve and Replace alternatives had predicted Noise Levels for the same

receptor locations that range from 67 to 78 dBA, and these two alternatives were ranked moderately preferred. The Maintain alternative was predicted to result in Noise Levels that range from 69 to 78 dBA and was ranked less preferred.

Considering the Noise and Air Quality modelled results and preference rankings, the Remove alternative was ranked as preferred with the lowest predicted levels. The Improve and Replace alternatives were ranked moderately preferred with slightly higher air emission and Noise Levels and Maintain was ranked less preferred with the highest modelled levels.

Natural Environment

For the Natural Environment criteria group, six criteria were considered: 1) Terrestrial Environment, 2) Aquatic Environment, 3) Water quality, 4) Water quantity, 5) Microclimate, and 6) Tree Lined and Shaded Street (measured through Tree Canopy Coverage).

Replace was ranked as moderately preferred for Terrestrial Environment as there was significantly more light at grade and more space for planting and natural features. However, with the continued presence of an elevated structure that blocks sunlight needed for vegetation it was not the preferred alternative. Remove was ranked as preferred as it had no elevated structure which resulted in greater opportunities for planting and natural features due to increased sunlight.

For the Aquatic Environment criterion the alternatives were all ranked equally. The relocation of Lake Shore Boulevard through the Keating Channel Precinct would allow for improved runoff control into the Keating Channel. This provided improvement of aquatic habitat in the Keating Channel, which was the case with all alternatives. All of the alternatives would utilize the new Don River crossing proposed in Don Mouth Naturalization Project, which supports an improved Aquatic Environment. As all of the alternatives provided these improvements they were all ranked equally.

The Water Quality and Water Quantity criteria related to how water could be treated and managed on-site. In regards to Water Quality, Replace was ranked preferred as it provided the greatest amount of new available unpaved ground surface with the reduction of Lake Shore Boulevard.

In regards to Water Quantity, the area of paved surface (open to the sky) of each alternative was determined to represent the amount of surface water run-off generated as rainfall events. The Replace and Remove alternatives were preferred with paved surface areas of 91,095 sq. m and 84,575 sq. m, respectively.

For the Microclimate criterion, east of Cherry Street both Maintain and Improve provided the same condition. Maintain was less preferred as it had the least amount of natural light access to

street-level west of Cherry Street. For Improve, reducing the deck of the elevated expressway would allow for more light to penetrate the ground level of Lake Shore Boulevard west of Cherry Street and therefore Improve was minimally preferred. Replace provided an improved Microclimate condition over Improve as the new elevated structure would be higher and have fewer bents/columns, allowing more light to penetrate the ground level and was ranked as moderately preferred.

Finally, under the Natural Environment criteria group was the Tree Canopy Coverage criterion. Tree Canopy Coverage reduces the urban heat island effect, improves air quality and increases evapotranspiration. As with previous criterion, Maintain and Improve provided the same condition east of Cherry Street with regards to Tree Canopy. West of Cherry Street, Maintain was less preferred as it provided minimal potential for tree planting. Improve was moderately preferred as there was some potential for tree planting west of Cherry Street along Lake Shore Boulevard. Replace was also moderately preferred for the Tree Canopy criterion. This was because the new elevated structure would allow more light to penetrate the ground level. This increases the potential for a Tree Canopy along the corridor. Remove was preferred for this criterion as it presented the greatest opportunity for tree planting along the corridor with the removal of the elevated structure and increased access to sunlight at ground level. This resulted in the greatest potential for Tree Canopy.

As a result of the evaluation of the six criterion under Natural Environment, Remove was ranked preferred, Replace was moderately preferred and Maintain and Improve were both ranked less preferred.

Cultural Resources

The Cultural Heritage criteria group considered four criteria including: Built Heritage, Cultural Landscape, Archaeology, and First Nations People and Activities. Regarding the first two criteria groups, none of the alternatives were expected to result in impacts to Built Heritage features and/or landscapes. As such, the alternatives were ranked equal for these two criteria. Similar, none of the alternatives were expected to result in impacts to First Nations People and Activities and were ranked equal for that criterion.

With regards to Archaeology, an assessment of the potential for impact on known archaeological resources in the study area was completed. As all alternatives generally have the same footprint, the potential for impact was distinguished based on the level of excavation expected to be required. The Maintain alternative was preferred with the potential for impact on three archaeological features. The Improve alternative was also considered as preferred as it resulted in the potential for impact on only two additional features. The Replace and Remove alternatives had the potential for impact on nine additional features. As the level of excavation

associated with the Remove alternative would be less, the Remove was ranked moderately preferred and Replace was ranked as less preferred for Archaeology.

Based on the criteria assessed, Maintain and Improve were preferred for Cultural Resources, Remove was moderately preferred, and Replace was less preferred.

Economics

Regional Economics

For the Regional Economics criteria group, two criteria were considered: City Competitiveness and Post Construction Congestion. Regarding the first criterion, the case study research examined the role/absence of expressways in or near CBDs. The research considered cities listed on the North American Competitiveness Ranking1 and compared the rankings of the cities to the highway access that exists in these cities.

The case study research also considered population and employment growth as well as office vacancy rates in cities/CBDs with and without freeway access. Based on the case study research, it was determined that none of the alternatives would have a material impact on the competitiveness of the City's Regional Economy. All alternatives were therefore ranked as equal for this criterion.

In regards to the Post-Construction Congestion criterion, an attempt was made by the City to measure the net economic impact of post- construction congestion associated with each of the alternatives from a 2008 study by HDR Corporation (HDR) on behalf of Metrolinx. It has been widely published that the "cost of congestion" in the GTHA is $6 billion annually (based on travel figures in 2006). This "cost of congestion", which has often been referred to as "lost productivity", was comprised of two components: the cost borne by commuters annually (estimated to be $3.3 billion) and the annual cost to the economy (estimated to be $2.7 billion).

The HDR study defined the congestion cost to commuters as the difference between the cost to commuters travelling in the peak hours versus the cost to commuters travelling in free-flow conditions. For the purpose of this EA Study, a comparative analysis of congestion cost was undertaken using the methodology in the HDR study to determine whether there is a discernible difference in the "cost of congestion" amongst the four alternatives.

The cost of congestion to commuters in the GTHA was estimated to be $3.3 billion of which approximately $1.4 billion (42%) was estimated to occur in the City of Toronto. These figures also included the delay to transit users, so when factoring out these transit delays the cost of congestion to auto commuters in the GTHA and Toronto was calculated to be $3.0 billion and $1.2 billion (40%), respectively. This cost of congestion to auto commuters, as outlined in the HDR study, was assumed to consist of the following elements:

1. Delay Cost – Longer travel times result in a cost to motorists in the form of the value placed on this excess time spent travelling. This is referred to as an "opportunity cost" which is equivalent to the value of activities foregone. The added unpredictability of travel times is included in this cost.
2. Increased Vehicle Operating Costs – Vehicle operating costs increase in congested traffic conditions due to the stop-and-go nature of travel. Additionally, the higher traffic volumes represent operating costs in excess of the socially optimal level.
3. Excess Vehicle Emissions Externality Costs – As with operating costs, vehicle emissions increase with congestion due to the stop-and-go driving conditions and the total amount of emissions is high due to the excess traffic volume.
4. Excess Accident Externality Costs – Congested traffic conditions result in a higher accident rate, which translates into additional costs to auto users.

In regards to the Gardiner East alternatives, congestion costs for the Maintain and Remove alternatives were developed as these two alternatives provide the range of road capacity associated with all of the alternatives. It is also important to note that the methodology used by Metrolinx to assess the cost of congestion is appropriate on a system-wide basis for a large area. The methodology was not intended to assess the cost of congestion for a specific facility. This methodology; however, was used strictly for comparative purposes to assess the relative merits of each alternative from a congestion cost perspective.

As a result of this Regional Economics analysis, all alternatives were ranked equally preferred for Regional Competitiveness and Post Construction Congestion.

Local Economics

For the Local Economics criteria group, the following three criteria were considered: Business Activity, Visitor/Tourism Attractiveness, and On-Street Parking.

Business Activity measures the number of potential new jobs in the study area. Remove was ranked as preferred for this measure as it has the potential for the highest number of new jobs as a result of the new development parcels (2,120). Replace results in 1,810 jobs and Maintain and Improve did not support any new jobs.

Visitor/Tourism Attractiveness considers the potential for the alternatives to change the attractiveness of the waterfront for visitors and tourism. Maintain and Improve were less preferred for this measure as they would encourage no change in existing visitor/tourism attractiveness. The Replace alternative was moderately preferred as it provided some potential to improve on the base case to encourage visitors/tourism to the waterfront, particularly with the potential to build an elegant architectural structure. However, it was Remove that had the

highest potential to attract additional tourists/visitors to the waterfront and allowed for on-street parking (off-peak periods) which could contribute to at-grade retail uses and visitor increases in the corridor. As such, Remove was ranked preferred for the Visitor/Tourism Attractiveness measure.

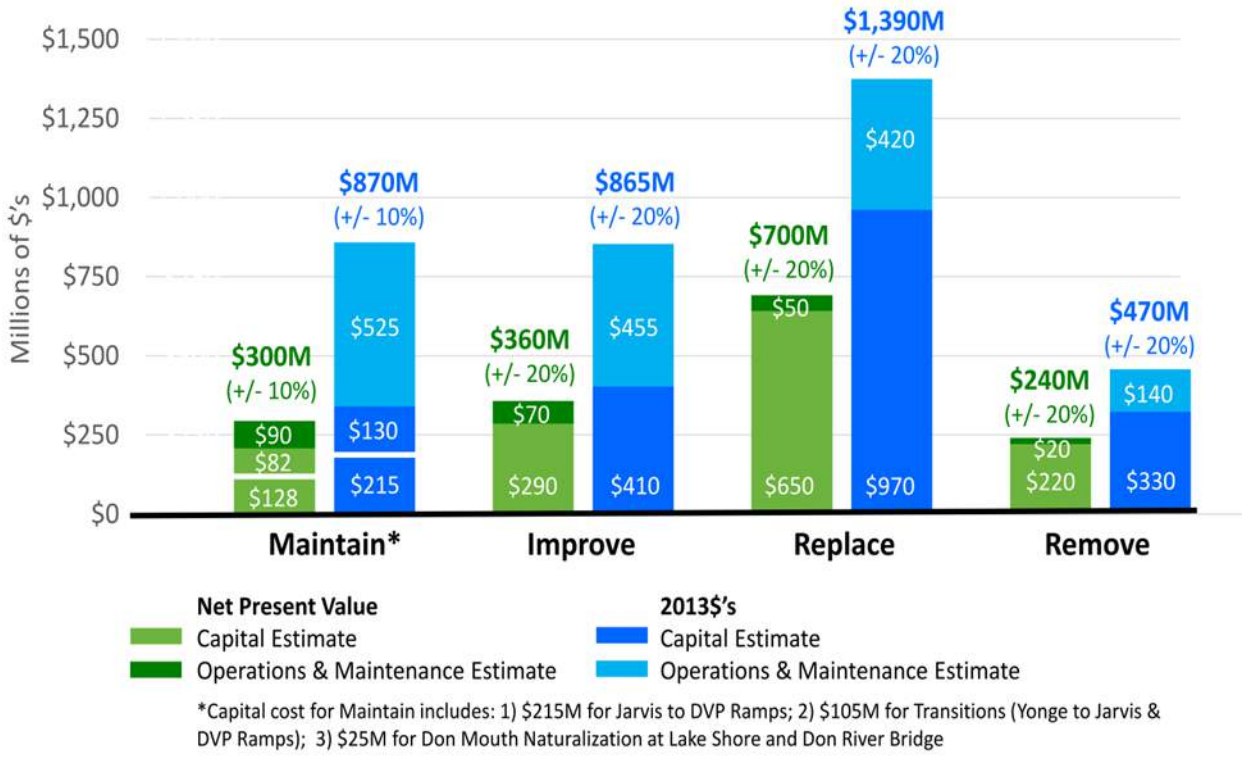
For On-Street Parking, the criteria measure looked at the ability to provide On-Street Parking which would encourage at-grade retail uses and improved street life. This measure considered the area west of Cherry Street for parking as all of the alternatives would allow for off-peak period parking on Lake Shore Boulevard in the Keating Channel Precinct. Maintain and Improve were less preferred as they did not allow for On-Street Parking west of Cherry Street. Replace and Remove were ranked preferred as Lake Shore Boulevard could be designed to allow off-peak period parking under both alternatives.

Direct Cost and Benefits

The final criteria group considered under the Economic lens was Direct Cost and Benefits. Three criteria were considered, Capital Cost and Funding, Lifecycle Cost and Land Value Creation. The Remove alternative was preferred for this criterion as it had the lowest estimated capital cost at $330 M. This was followed by Maintain ($345 M), Improve ($410 M) and Replace which was the most expensive at $970 M (all costs in 2013$). Also considered under this criterion was the measure Property Acquisition. None of the alternatives were expected to require significant private property. There was potential for minimal private property acquisition along the Don Roadway (to the east of the right-of-way) for the Remove alternative to accommodate new ramps that are required to connect the Don Valley Parkway with the new at-grade boulevard. The Funding Availability measure was provided as information but was not considered as an appropriate measure to rank the alternatives.

Lifecycle Costs as a net present value (NPV) were determined and include the total capital cost and the 100-year operations and maintenance costs for each alternative. Net present value (NPV) is the present day (2013) value of the cash expenditures to implement (initial capital costs) and operate/maintain (yearly costs) the facility for a given period (100 years). The Remove alternative was ranked preferred with the lowest lifecycle cost ($240 M). The next lowest NPV cost alternative was Maintain at $300 M, followed by Improve at $360 M and the most expensive was Replace with a NPV cost of $700M (See **Figure 4.5**).

Figure 4.5: 100-year Lifecycle Costs (2013$ and Net Present Value)



The Land Value Creation criterion considered the value of new lands potentially available for future development. These are lands under City control that could be sold to offset the capital cost for the alternative. As shown in **Table 4.2**, Remove has the greatest potential for Land Value Creation with a potential benefit of $230 M (2013$) or ($85 M NPV) followed by Replace at $145 M (2013$) and Improve at $3 M (2013$).

Considering the total Capital Cost, Lifecycle Costs and the Land Value Created for each alternative, a NPV net cost was determined. The Remove alternative was identified as preferred with a NPV net cost of $155 M. The Maintain and Improve alternatives were ranked moderately preferred with a NPV net cost of $300M and $358 M. The Replace alternative was ranked less preferred as it had the highest NPV net cost at $632 M.

4.3.2.2 Consideration of Public Input - Alternatives Evaluation

Consultation activities associated with the evaluation of the alternative solutions were focused on the engagement of the SAC, the holding of a public meeting with a live webcast, the release of the presentation package on the project web site, and an open comment period following the public meetings. The Stakeholder Advisory Committee met on February 4th, 2014 to review and provide feedback on the alternatives evaluation results. A public meeting was held on

February 6th, 2014 at the Toronto Reference Library, with over 250 participants at the meeting and another 50 or more watching the webcast and participating online. Hundreds of people either completed an online survey on the project website or weighed in via Twitter to provide their feedback on the evaluation results. The following provides a high level summary of public feedback received during this round of the consultation.

The majority of consultation participants (approximately 60%) indicated support for the Remove alternative. The benefits cited by those who favour the remove alternative include: cost-effectiveness; creation of opportunities for future public (e.g., parks and greenspace) and private redevelopment (e.g., commercial and residential buildings); improved accessibility to the waterfront; and the opportunity to enhance public transit and alternative modes of transportation.

- Participants also expressed support for the Maintain (approximately 11%) and improve (approximately 5%) alternatives. Those who favour these options cited the need to keep existing highway capacity, mitigate pollution from idling vehicles, and maintain the movement of goods and services. Concerns were also expressed about the potential for traffic displacement with the remove option.
- There was also support for the Replace alternative (approximately 4%) with those who support this option citing safety as a key benefit.
- Approximately 20% of participants provided general feedback on the evaluation results and/or advice to the project team and did not express clear support for any of the alternatives.
- Many participants indicated that investments in public transit should be prioritized, particularly if the Gardiner Expressway east of Jarvis is removed. Participants expressed concern about removing the elevated highway if long-term transit assumptions in the modeling and study are not realized.

The details of the consultation activities are documented in **Appendix B, Record of Consultation.**

4.3.2.3 Paired Comparison Evaluation

Considering the preference rankings of the alternatives by the criteria group as described in the previous section, the following presents the comparative evaluation of the alternatives. This comparison was undertaken in two ways; first was an overview level comparison of the alternative preferences by criteria group. And second, was a paired-comparison approach.

Considering the ranking of alternatives by criteria group as presented in the previous section and in **Table 4.2**, this section presents an overview of the preference rankings. **Table 4.3**

presents a summary of the preference rankings for the alternatives for the 16 criteria groups, which was also presented to the public at the February 2014 PIC. Also presented is the extent to which the study goals are met by each alternative. As the alternatives are considered as equally preferred for the Transit criteria group and the Regional Economics criteria group, these two criteria groups do not help to differentiate among the alternatives. Of the remaining 14 criteria groups that do differentiate among the alternatives, the Remove alternative is identified as *preferred* for eight criteria groups and identified as *moderately preferred* for three criteria groups. The Remove alternative was identified as being *less preferred* for only three criteria groups. If all the criteria groups/criteria are considered to have equal weight, and the level of effect associated with each criteria group is considered similar, then the Remove alternative can be identified as being the overall technically preferred alternative. The paired-comparison approach in the following section describes the trade-offs to support the identification of an overall preferred alternative.

As previously described, to identify the trade-offs among the alternatives a "paired-comparison" approach was used. This approach involves the comparison of the alternatives in pairs based on the criteria group rankings. The alternative rationalized to be preferred of the pair is then carried forward for the next comparison. The alternative that is rationalized to be preferred over all the other alternatives is considered to be the overall preferred alternative. The paired comparisons of the alternatives were completed at a criteria group level. The key trade-offs between the pairs of alternatives being compared were then highlighted at the Evaluation Lens level (four Lenses were considered), as presented in **Table 4.4 through Table 4.6.**

The first comparison made was **Maintain vs. Improve**. The results of this comparison are presented in **Table 4.4**. The Maintain and Improve alternatives are considered equal for the Transportation Lens. The Improve is considered to be preferred for Urban Design and Environment lenses whereas the Maintain is considered preferred for the Economics (costs) lens. It is the opinion of the evaluation team that the Urban Design and Environment benefits of the Improve alternative justify the additional cost (net cost of $58 M NPV). This includes increased access to light and diminished volumes of noise due to the reduced width of the Gardiner, creation of wider more comfortable sidewalks between Jarvis and Bonnycastle Streets, improved and safer pedestrian crossings at intersections, enhanced lighting and signage along Lake Shore Boulevard, and an addition of an east-west multi-use pathway along the north edge of Lake Shore Boulevard. The Improve alternative is therefore considered preferred and carried forward to the next paired comparison.

The next comparison is **Improve vs. Replace**. The results of this comparison are presented in **Table 4.5**. The Improve alternative is considered preferred for Transportation (less complex construction) while the Replace alternative is considered preferred for Urban Design (improved streetscape, street animation potential and pedestrian experience). Both alternatives were ranked as equal for the Environment Lens. A key disadvantage of the Replace alternative is with respect to Economics, where the Replace alternative is expected to have a higher net cost of approximately $275 M NPV. The Urban Design benefits of the Replace alternative do not justify this additional net cost in the opinion of the evaluation team and, as such, the Improve alternative is recommended as preferred over the Replace alternative.

The final comparison is **Improve vs. Remove.** The results of this comparison are presented in **Table 4.6**. The key advantages of the Remove alternative are with respect to Urban Design, Environment and Economics. The Improve alternative is preferred for Transportation & Infrastructure. The Remove alternative will transform the corridor into a place that is consistent with the goals of this study and of the Central Waterfront Secondary Plan. Local benefits are considerably greater and the net costs are significantly less (approx. $200 M NPV less). Considering Transportation, the Remove alternative will result in much better pedestrian and cycling opportunities in the waterfront area. The most notable disadvantage associated with the Remove alternative is with respect to the auto user, as auto travel times will be higher (about 5 minutes more on average during the AM peak hour period) and greater auto disruption is expected during the construction period. It is noted that 90% of all AM peak hour commuters inbound to the Central Area are unaffected by the Remove alternative (change in travel time of less than 2 minutes). Considering the goals of the study, the advantages of the Remove alternative are considered greater than its disadvantages. **For these reasons the Remove alternative was recommended as the technically preferred alternative**.

Table 4.4: Maintain vs. Improve Paired Comparison

MAINTAIN VS. IMPROVE					
Evaluation Lenses	**Criteria Groups**	**Maintain**	**Improve**	**Comparison**	**Preference**
Transportation & Infrastructure	Automobiles	Preferred - As average AM peak hour auto travel times for select OD pairs are slightly shorter – typically by less than 5 min.	Less preferred - As average AM peak hour auto travel times for select OD pairs are slightly longer – typically by less than 5 min. About 15% of all auto travellers in transportation study area to experience a "Minor Impact" on travel time. No auto travellers to experience a "Noticeable Impact" (greater than 7 min delay – on average).	On balance the slight auto benefit associated with the Maintain alternative (potential for slight delay) is considered to be similar to the Pedestrian/Cyclist/Safety advantages of the Improve alternative. As such the alternatives are considered to be equal in regards to Transportation and Infrastructure.	**EQUAL**
	Transit	Equal: Maintain and Improve Options result in similar travel times on east-west routes serving transit in the Central Area, such as Dundas, Queen, and King Street Streetcars.			
	Pedestrians	Less Preferred – Slightly longer pedestrian crossing distances. Substandard NS sidewalks. Less total sidewalk total linear distance (1,588 m).	Preferred - shorter pedestrian crossing distances. NS sidewalks would be improved to meet City standard. Longer total sidewalk linear distance (4,000m).		
	Cycling	Less Preferred - Does not facilitate an east-west multi-use pathway along north side of corridor west of Cherry Street.	Preferred - Facilitates an east-west multi-use pathway along north side of corridor west of Cherry Street.		
	Movement of Goods	Equal - Provides similar overall road capacity and access to Port Lands, South of Eastern and the Waterfront, in general. Off peak travel times expected to be very similar among the two alternatives.			
	Safety	Less Preferred – Safety levels along Lake Shore Boulevard generally the same.	Preferred – Safety levels along Lake Shore Boulevard generally the same. Improve roadway geometry for FGE with inclusion of shoulders as part of re-decking.		
	Constructability	Equal - Constructability differences are considered to be minor. Both options will result in traffic delay from Gardiner re-decking activities. Expected construction period for these options is in the range of 6 years although acceleration of this period is possible subject to City funding. And while construction for the Improve alternative is considered to be slightly more complicated as a result of the need to relocate a select number of Gardiner support piers, the difference is not considered to be overly significant. (Note that both options are to involve re-paving of the road surface as part of road maintenance activities and as such would both involve traffic delays as a result).			
Urban Design	Planning	Equal – Both alternatives are equally compatible with existing plans and policies and have similar flexibility to accommodate additional proposed new growth. Neither alternative would achieve the Central Waterfront Secondary Plan principles.		The Improve alternative proposes a number of modest Urban Design opportunities that include intersection modifications to better facilitate pedestrian crossings, the addition of an east-west multi-use pathway, narrowing of the FGE to allow for more access to air and light, the creation of a new wider sidewalk/public realm area between Jarvis and Bonnycastle, new lighting and signage, and general clean-up to the Lake Shore Boulevard road. With these changes, the Improve option is considered to be preferred.	**IMPROVE**
	Public Realm	Less Preferred – Existing conditions hinder attractiveness and placemaking opportunities, no opportunity for continuous sidewalk & multi-use pathway.	Preferred – Increased opportunity to improve the attractiveness through removal of pedestrian and bicyclist barriers and encumbrances, minor realignment of ramps, and reconfiguration of intersections. Continuous north-side multi-use pathway possible.		
	Built Form	Equal – neither alternative is expected to result in changes to adjacent planned developments. Same amount of two-sided street through the corridor.			

MAINTAIN VS. IMPROVE					
Evaluation Lenses	**Criteria Groups**	**Maintain**	**Improve**	**Comparison**	**Preference**
Environment	Social & Health	Less Preferred – Slightly higher air emissions and noise levels.	Preferred – Slightly lower air emissions and noise levels.	Slight preference for the Improve alternative as a result of predicted lower air emission levels and noise levels.	**IMPROVE**
	Natural Environment	Equal – Alternatives have limited opportunity for new/enhanced habitat & trees. And while the Improve option has a slightly smaller area of impervious surface, this difference is expected to not be enough to result in noticeable environmental benefit to the area.			
	Cultural Resources	Equal – Similar potential for impact on known archaeological features.			
Economics	Regional Economics	Equal – No significant difference in city competitiveness.		The Improve option is estimated to have slightly higher lifecycle cost than Maintain (including initial capital cost and 100 year O&M costs). Considering economic benefits, the Maintain alternative also has a lower net cost. The Maintain alternative is considered to be preferred.	**MAINTAIN**
	Local Economics	Equal – No significant difference in visitor and tourism attractiveness to corridor.			
	Direct Cost & Benefits	Preferred - Facility lifecycle cost (NPV construction and O&M costs) of $300 M. Net cost of $300 M (net of potential economic benefits).	Less Preferred - Facility lifecycle cost (NPV construction and O&M costs) of $360 M. Net cost of $358 M (net of potential economic benefits).		

Table 4.5: Improve vs. Replace Paired Comparison

IMPROVE VS. REPLACE					
Evaluation Lenses	**Criteria Groups**	**Improve**	**Replace**	**Comparison**	**Preference**
Transportation & Infrastructure	Automobiles	Equal: Both alternatives has relatively similar average peak AM hour average travel times from select OD pairs that have been modelled.		The key difference among the alternatives is with respect to constructability. And while feasible, construction of the Replace option is expected to be very complex and likely to result in multi-year travel delays in the area. As such, the Improve alternative is considered to be preferred.	**IMPROVE**
	Transit	Equal: Maintain and Improve Options result in similar travel times on east-west routes serving transit in the Central Area, such as Dundas, Queen, and King Street Streetcars.			
	Pedestrians	Less Preferred - Longer Lake Shore Boulevard crossing distances than Replace. Intersection improvements and Gardiner deck reduction improves crossing experience but presence of ramps at some intersections makes crossing more complicated for pedestrians. Less total sidewalk distance (4,000m).	Preferred - Shorter Lake Shore Boulevard crossing distances than Improve. Crossing experience improved with smaller/higher Gardiner deck. Absence of ramps/free turns makes corridor crossing less complex. Longer total sidewalk linear distance (4,400m).		
	Cycling	Less Preferred – New north cycling facility can extend only to Jarvis Street.	Preferred – New north cycling facility can extend to Yonge Street.		
	Movement of Goods	Preferred – Due to greater road capacity provided.	Less Preferred – Less road capacity may have an impact on the movement of goods through the area.		
	Safety	Less preferred – More road lanes for pedestrians to cross and does not improve the majority of the existing road safety concerns. Does eliminate the southbound right turn channel on Sherbourne Street.	Preferred – Has fewer road lanes for pedestrians to cross and eliminates existing road safety concerns at Jarvis Street, Sherbourne Street, and the Don Roadway.		
	Constructability	Preferred - Shorter construction period but potential for reduction at a higher cost. Less complex traffic management.	Less Preferred - Longer construction period. More complex traffic management.		
Urban Design	Planning	Less Preferred - While both alternatives can accommodate future growth in the area, Improve does not allow for full achievement of the Central Waterfront Secondary Plan and does not provide potential to better accommodate other proposed developments east of the DVP/Don River.	Preferred - While both alternatives can accommodate future growth in the area, Replace allows for a fuller achievement of the Central Waterfront Secondary Plan, provides a more attractive context for new waterfront development, and provides more potential to accommodate other proposed developments east of the DVP/Don River.	The Replace alternative is considered to be preferred for all urban design criteria groups and is thus considered preferred.	**REPLACE**
	Public Realm	Less Preferred - Minor to moderate improvement in streetscaping – minor increase in public realm. Narrowing of Gardiner deck will allow more natural light on south side. Some opportunity for more trees.	Preferred - Greater opportunity for streetscaping improvements and greater new public realm space created.		
	Built Form	Less Preferred – Majority of space along Lake Shore Boulevard will consist of “back of house” uses and will not provide active uses at-grade.	Preferred – Up to 2,160 m of building fronts expected to have active uses at-grade oriented towards Lake Shore Boulevard.		
Environment	Social & Health	Equal – Modeling results indicate that the alternatives would result in similar air emissions and noise levels.		Minimal difference between these two	**EQUAL**

IMPROVE VS. REPLACE					
Evaluation Lenses	**Criteria Groups**	**Improve**	**Replace**	**Comparison**	**Preference**
	Natural Environment	Less Preferred - Limited opportunity for new/enhanced habitat & trees. Greater area of impervious surface.	Preferred - Greater opportunity for increased habitat/trees in corridor. Higher and slimmer overhead structure provides some increased light access. Less area of impervious surface.	alternatives and therefore they are ranked equally.	
	Cultural Resources	Preferred – Less potential for impact on known archaeological resources.	Less Preferred - Greater potential for impact on known archaeological resources as a result of required excavations.		
Economics	Regional Economics	Equal – No significant difference in city competitiveness.		The Improve alternative has significantly less net lifecycle cost (net of economic benefit - approx. $275 M less). The Improve alternative is therefore preferred.	**IMPROVE**
	Local Economics	Less Preferred – No new jobs generated. No increased attractiveness to visitors/tourists.	Preferred – More new jobs potentially generated (1,810). Improved pedestrian crossings of Lake Shore Boulevard may enhance tourism/visitor connections between the City and the waterfront.		
	Direct Cost & Benefits	Preferred - Facility lifecycle cost (NPV construction and O&M costs) of $360M. Net cost of $358M (net of potential economic benefits).	Less Preferred - Highest facility lifecycle cost (NPV construction and O&M costs) - $700 M. Higher net cost - $632 M (net of potential economic benefits).		

Table 4.6: Improve vs. Remove Paired Comparison

IMPROVE VS. REMOVE					
Evaluation Lenses	**Criteria Groups**	**Improve**	**Remove**	**Comparison**	**Preference**
Transportation & Infrastructure	Automobiles	Preferred – As average AM peak hour auto travel times for select OD pairs are slightly shorter – typically by about 5 min on average. Slightly less volume of auto travellers to experience a “Minor Impact” on travel times (15%). No auto travellers to experience a “Noticeable Impact” (greater than 7 min delay – on average).	Less preferred - As average AM peak hour auto travel times for select OD pairs are slightly longer – typically by about 5 min on average. Slightly greater volume of auto travellers in study area to experience a “Minor Impact” on travel time (20%). 5% of auto travellers to experience a “Noticeable Impact” (greater than 7 min delay – on average).	The Improve is preferred for the Auto, Movement of Goods and Constructability criteria groups.	**IMPROVE**
	Transit	Equal: Maintain and Improve Options result in similar travel times on east-west routes serving transit in the Central Area, such as Dundas, Queen, and King Street Streetcars.			
	Pedestrians	Equal: Both alternatives will provide improved north-south and east-west sidewalks that will meet if not exceed city standards.			
	Cycling	Equal – Both options provide for a new facility along the north side of the corridor that will connect with all other existing and planned cycling facilities.			
	Movement of Goods	Preferred – Due to greater road capacity provided.	Less Preferred – Less road capacity may have an impact on the movement of goods through the area.		

IMPROVE VS. REMOVE					
Evaluation Lenses	**Criteria Groups**	**Improve**	**Remove**	**Comparison**	**Preference**
	Safety	Equal – Both options address current safety concerns with the corridor including largely if not entirely removing free-flow turns, eliminating safety concerns at key intersections and address intersections with difficult geometry.			
	Constructability	Preferred - Similar construction period (6 years), but with less complex traffic management. No detour roads expected to be required.	Less Preferred – Similar construction period (6 years), but with more complex traffic management requirements and greater potential for traffic delays.		
Urban Design	Planning	Less Preferred - Accommodates current waterfront plans. Less flexibility to accommodate additional growth.	Preferred - Further advances the goals of waterfront plans. More flexibility to accommodate additional growth.	The Remove is clearly preferred for Urban Design. The take-down of the elevated FGE creates an opportunity for dramatic improvement in the urban design fabric of the City. This action transforms the corridor and allows the full development of a vibrant urban district introduced by a tree canopied urban boulevard.	**REMOVE**
	Public Realm	Less Preferred - Minor to moderate improvement in streetscaping – minor increase in public realm. Narrowing of FGE will allow more natural light on south side. Some opportunity for more trees.	Preferred - Opportunity for significant streetscaping improvements. Significant increase in public realm area within corridor. Corridor will be open to sun and sky.		
	Built Form	Less preferred - Majority of space along Lake Shore Boulevard will consist of "back of house" uses and will not provide active uses at-grade.	Preferred - Up to 2,920 linear metres of building fronts expected to have active uses at-grade oriented towards Lake Shore Boulevard.		
Environment	Social & Health	Less Preferred – Higher air emissions and noise levels.	Preferred – Lower air emissions and noise levels.	Combination of lower AQ and noise effects with higher opportunity for new green space makes Remove preferred.	**REMOVE**
	Natural Environment	Less Preferred - Limited opportunity for new/enhanced habitat & trees. Greater area of impervious surface.	Preferred - Greater opportunity for increased habitat/trees in corridor with increased access to light and less area of impervious surface.		
	Cultural Resources	Preferred – Less area of disturbances and less potential for impact on known archaeological features	Less Preferred – Potential for greater impact on known archaeological features as a result of excavation.		
Economics	Regional Economics	Equal – No significant difference in city competitiveness.		The Remove alternative is preferred from an economics perspective as it has lower lifecycle cost ($120 M less) and a lower cost net of economic benefit (approx. $203 M less).	**REMOVE**
	Local Economics	Less Preferred –No new jobs generated.	Preferred – More new jobs potentially generated (2,120).		
	Direct Cost & Benefits	Less Preferred - Facility lifecycle cost (NPV construction and O&M costs) of $360 M. Net NPV net cost of $358 M (net of potential economic benefits).	Preferred - Lower capital/lifecycle cost (NPV construction and O&M costs) - $240 M. Lower net NPV net cost - $155 M (net of potential economic benefits).		

4.3.2.4 Stage 1 Alternatives Evaluation Conclusion

The key trade-off in identifying Remove as the preferred alternative is with respect to auto travel times, which are expected to add on average another 5 to 10 minutes in the AM peak hour period (over the Maintain alternative) depending on the travel route. As previously noted, it is the view of the study team that the Urban Design, Environment, and Economic advantages associated with the Remove alternative off-set the additional auto travel times which impact a small proportion of the total commuter volumes as noted in the following:

- In regards to traffic movement in the transportation study area (all directions), 75% of the vehicles will experience a less than 2 min increase (over the Maintain), 20% will experience a 2 min to 7 min increase and only 5% will experience more than 7 min increase; and,
- In regards to all commuters coming into the Downtown, approximately 90% of inbound commuters to the core in the AM peak hour are unaffected with the Remove.

In conclusion, the Remove alternative provides the following:

- Contributes to achieving a better balance among transportation modes including driving, walking, cycling, and transit use;
- Addresses the many safety issues in the corridor for pedestrians, cyclists and drivers alike;
- Reduces air emissions and noise levels in the corridor;
- Provides a long-term cost saving to the City;
- Opens a signature, sun-filled, path into Downtown from the Don Valley and eastern;
- neighbourhoods providing vistas to the City's skyline beyond a green canopy of trees, promenade plantings, and park spaces;
- Invests in a public realm system that is characteristic of a great urban street in a city that values and invites its residents, workers and visitors to walk or cycle;
- Delivers an attractive 2-sided Lake Shore Boulevard that animates the corridor, and invites people to the waterfront whether at the Downtown core, St. Lawrence neighbourhood or Distillery District;
- Brings a human-scale promenade edge to the Keating Channel with the removal of the elevated Gardiner;

- Improves the attractiveness of development lands in the corridor and adds value to these properties; and,
- Provides support for other planned developments and transit initiatives through the removal of the expressway.

4.4 Alternative Solutions Development & Evaluation: Stage 2

4.4.1 Rationale for Additional Alternatives Solution Development and Evaluation

A recommendation for the Remove alternative was presented to City of Toronto Public Works and Infrastructure Committee (PWIC) on March 4, 2014. After careful consideration of the City Staff report and its recommendation for the Remove alternative, plus the deputations made to PWIC by various stakeholders, PWIC provided the following direction (referral decision):

1. *Work with WT and community stakeholders to review the recommended option [Remove] under the EA process to mitigate congestion concerns;*
2. *Prepare an additional option that combines the maintain and replace components to preserve expressway linkage and functionality between the Gardiner Expressway and the Don Valley Parkway, and evaluate it against the EA criteria and the following:*
    a. *Transportation functionality;*
    b. *Impacts on key economic sectors;*
    c. *Cost benefit;*
    d. *Future land use considerations;*
    e. *Public transit components;*
    f. *Environmental impacts; and*
    g. *Neighbourhood growth and compatibility.*
3. *Report back to City Council in February 2015, through the Public Works and Infrastructure Committee.*

The direction from PWIC to complete item 2 of the referral decision reflects consideration of the input received from stakeholders and the public. Public deputations made to PWIC and input

received through EA consultation activities identified public interest in considering a solution that could maintain the Gardiner – DVP connection while also achieving removal of the Gardiner Expressway east of the DVP / Don Roadway.

On the basis of this direction, the Gardiner East EA project team undertook the following work:

1. Optimized the Remove (Boulevard) alternative to improve auto travel times;
2. Developed a Hybrid alternative (to address item 2 of the PWIC referral decision);
3. Studied Goods Movement and City Economic Competitiveness impacts; and
4. Assessed and compared the optimized Remove (Boulevard) alternative against the new Hybrid alternative.

The following sections document the results of this work.

4.4.2 Remove (Boulevard) Alternative

4.4.2.1 Strategies to Mitigate Traffic Congestion

One of the key directions stemming from the March 4, 2014 Public Works and Infrastructure Committee meeting was to review the Remove (Boulevard) alternative and identify measures to mitigate traffic congestion concerns.

The primary constraints considered within the boulevard section were related to competition for traffic signal "green time" between the following conflicting functions:

- High westbound (and eastbound) through traffic during peak periods;
- High eastbound left turn demand at some intersections;
- Southbound traffic demand accessing the boulevard; and
- Pedestrian crossing time.

Although a variety of alternate roadway configurations and cross sections were considered (including some less conventional treatments such as Michigan U-turns which provide specific U-turn lanes along a roadway), the optimization process resulted in sufficient improvement to the "conventional" Remove (Boulevard) configuration. Some of the key improvements are presented below:

- Adjustments to the Gardiner Expressway cross section and its interface with Lake Shore Boulevard, west of Jarvis Street (including maintaining three eastbound lanes east of Rees Street);

- Revised lane configurations at intersections — in particular, identifying opportunities to provide southbound dedicated right turn lanes on streets intersecting with the new Boulevard (e.g., at Jarvis Street);
- Road network adjustments (Queens Quay extension east of Cherry Street);
- Modifications to signal phasing patterns at some intersections (review of advance left turn phases; more efficient accommodation of the Cherry Street streetcar and Waterfront East LRT);
- Confirmation of pedestrian crossing requirements (assuming two-stage crossings where a wide median is available as a refuge, and single-stage crossings otherwise);
- Strategic turn prohibitions to maximize the efficiency of intersections (Lake Shore Boulevard at Cherry Street and at Queens Quay);
- Adjustments to the length of green signals at individual intersections to more efficiently allocate capacity between conflicting movements; and
- Improvements to signal coordination between adjacent intersections to minimize delays and reduce queue lengths.

It is noted that while the previous transportation model runs assumed a higher level of traffic demand reduction for the Remove (Boulevard) alternative (25% versus 15% assumed for the other alternatives), for the optimized Remove (Boulevard) model runs, the Remove (Boulevard) alternative was able to function at the same level of traffic demand reduction (i.e., 15%) as the Hybrid alternative . As such, the Remove (Boulevard) alternative would be able to process the same volume of traffic as the Hybrid under its optimized configuration (70,500 trips were processed for both models in the AM peak hour).

Other Strategies Considered

In addition to the strategies noted above to reduce traffic congestion associated with the Boulevard alternatives, also considered were the inclusion of additional travel lanes and grade separated crossings of Lake Shore Boulevard. The following describes the examination of these other strategies.

Additional Travel Lanes

In 2013, as a result of concerns about travel time impacts related to the Remove alternative, the project team explored the potential to expand Lake Shore Boulevard from eight through-lanes to 10 through-lanes in order to determine the extent to which the additional travel times could be reduced. The traffic modelling of a 10-lane Remove configuration was completed prior to the optimization of the Remove alternative, thus the results could be different with the

optimized Remove now under study. Traffic modelling for the 10-lane Remove configuration resulted in a decrease of three minutes for eastbound trips (from Spadina/Gardiner Expressway to Front/Parliament) but added one minute to travel time for south-to-west and westbound travel. The increases in travel time for the south-to west and westbound trips as forecasted in the model are potentially attributed to more vehicles being attracted to the corridor under a 10-lane scenario. Although some travel time reductions could be achieved with the addition of two through-lanes, the resulting increase in the pavement width of the roadway by approximately 6.6 metres would have other implications. The wider pavement would require more pedestrians to cross the road in two stages instead of one stage as with the eight-lane configuration. Furthermore, in the area between Small Street and Cherry Street, the existing road right-of-way would need to be widened to accommodate the 10- lane cross section. Due to the proximity of the corridor to the railway embankment to the north, an additional one-half acre of private property south of Lake Shore Boulevard would have to be acquired. Considering these negative impacts, particularly the cost and timing of land acquisition, the 10-lane configuration was not pursued further.

Pedestrian Overpasses at Key Intersections

The potential to install pedestrian overpasses to allow for more “green time” for auto traffic was explored. Although pedestrian bridges over Lake Shore Boulevard might allow north-south "green times" for vehicle crossings to be reduced at certain intersections, the need for some amount of green time to accommodate these vehicle movements would remain and potential gains for additional east-west green times would be limited. There would also be significant considerations and potential constraints in the design and implementation of grade-separated pedestrian crossings, whether enclosed climate-controlled bridges or unenclosed walkways, as follows:

- There would be challenges in finding feasible horizontal and vertical alignments for pedestrian bridge(s) over Lake Shore Boulevard, particularly with the proximity to and the constraints created by the rail corridor.
- Ramps and/or elevators would be required to ensure that bridges are accessible and compliant with the Accessibility for Ontarians with Disabilities Act (AODA).
- The separation of pedestrian and vehicular traffic would increase safety but if the bridges are not convenient, pedestrians would attempt to cross at-grade without adequate crossing time and protection. Therefore, for safety reasons, it would be necessary to provide minimum pedestrian walk times regardless, affecting the potential for increased east-west vehicular capacity.

- Pedestrian bridges are generally not preferred by pedestrians when at-grade options exist, unless they are fully climate-controlled, directly connected to buildings and/or part of a continuous pedestrian network or incorporated into adjacent developments such as the PATH (Toronto's downtown underground pedestrian walkway).
- Pedestrian bridges would detract or obstruct view corridors along Lake Shore Boulevard.
- Clearances and available head room may not readily facilitate enclosed crossings and may require crossings at considerable elevation or open platforms.
- Crossings would need to be movable to allow for Gardiner maintenance activities such as the recent Watermark Place enclosed bridge accessed in the Air Canada Centre. Although staff were directed to examine the potential for pedestrian overpasses at key intersections, the feasibility of pedestrian underpasses could also be examined as part of the Alternative Designs stage, should the Remove option be selected as the preferred EA alternative.

4.4.2.2 Optimized Remove

The Remove alternative (renamed to "Remove (Boulevard)" to clarify the changes that are proposed under this alternative) included the following modifications to the corridor:

- Remove all of the 2.4 km elevated expressway east of approximately Jarvis Street, including removal of about 750 m (EB lanes) and 850 m (WB lanes) of the existing Logan on/off ramps.
- Rebuild the corridor with a new at-grade 8-lane tree lined Lake Shore Boulevard, west of the Don River and a new 6-lane at-grade boulevard east of Don River.
- Develop new public realm space within the corridor.
- Remove all road infrastructure along Keating Channel.
- Build new DVP ramp connection at east end of the Keating Channel Precinct (2 lanes each direction).
- Build new Gardiner ramps west of Jarvis Street (3 lanes each direction).
- Build new multi-use pathway along north side of Lake Shore Boulevard to extend to Yonge Street.

The basic configuration of the Remove (Boulevard) alternative remained largely the same as previously developed and evaluated in 2014. **Figure 4.6** presents a rendering of the Remove (Boulevard) alternative at the east end of the corridor which shows a new two-way DVP ramp

over the Don River that connects with the new Lake Shore Boulevard through the Keating Channel Precinct lands.

As a result of the Remove (Boulevard) alternative optimization activities, the additional travel times of Remove (Boulevard) over the 2031 future Baseline or Maintain alternative for the selected origin-destination trip pairs were reduced to a 3-5 minute increase. This is a reduction in travel time over the previously reported 5-10 minute increase of the Remove alternative in 2014.

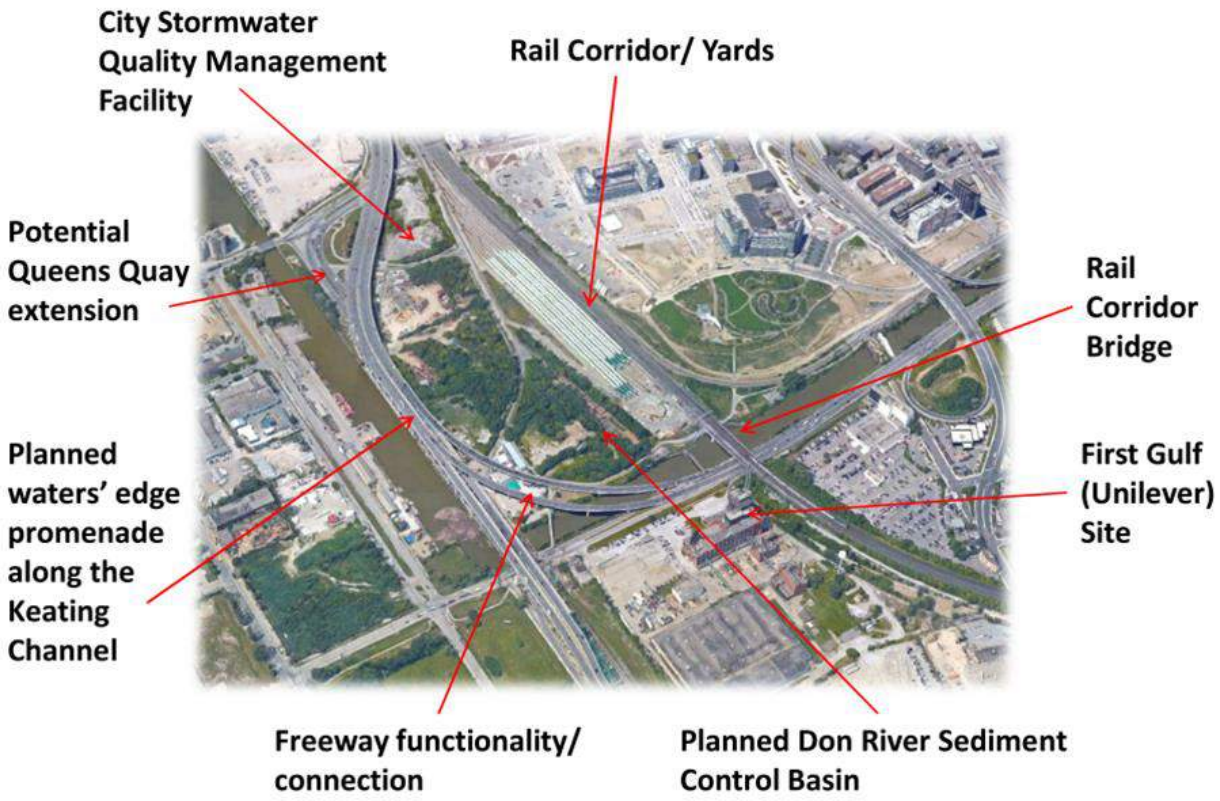
Figure 4.6: Remove Alternative – Rendering Through Keating Channel Precinct

4.4.3 Hybrid Alternative Development

4.4.3.1 Strategies to Enhance the Hybrid Alternative

In the development of a Hybrid alternative, there were several features/considerations in the Keating Channel Precinct that were taken into account as presented in **Figure 4.7** below.

Figure 4.7: Hybrid Development Considerations



In the review and development of the Hybrid concept, variations to the concept were proposed by different stakeholders. This included an alternate configuration by First Gulf, a land developer that is proposing a major commercial development on the east side of the Don River, south of the Metrolinx rail tracks and north of Lake Shore Boulevard. This proposal included a much tighter alignment that would run south of the rail corridor (see **Figure 4.8**). Furthermore, local community concern was expressed regarding the proposed new Cherry Street access ramps and its potential for impact on urban design considerations in the Keating Channel Precinct.

Figure 4.8: First Gulf Hybrid Concept

Considering stakeholder input, the project team explored Hybrid concept variations including:

- First Gulf Hybrid Concept;
- Hybrid with no new access ramps east of Cherry Street;
- Hybrid with a westbound only new on-ramp east of Cherry Street; and
- Improve Existing Jarvis Street westbound On-Ramp.

<u>First Gulf Hybrid Concept</u>

In consultation with the First Gulf team it was determined that their proposal would not be feasible due to:

- The proposed tight alignment would require a 50 km/hr design speed ramp that would require too large of a speed reduction of vehicles travelling along the DVP/Gardiner.

- The "hugging" of the rail corridor along its south side would require passing over the existing stormwater management facility on the east side of Cherry Street. This would require changes to the planned building at this location (it would need to be lowered) and would limit underside access to an elevated expressway.

Hybrid Without New On/Off Ramps at Cherry Street

By removing the existing Logan on-ramp and not providing a new westbound Gardiner on-ramp at Cherry Street, westbound traffic on Lake Shore Boulevard would have to use the existing on-ramp at Jarvis Street to access the Gardiner. It is expected that the volume of traffic that would access the existing Jarvis Street on-ramp would be significantly less than that of the Logan on-ramp today as 75% of AM peak-hour traffic volumes on the Logan on-ramp are destined to downtown locations and would therefore likely remain on Lake Shore Boulevard to reach their destinations (vehicles using the Jarvis on-ramp cannot exit to the Yonge/Bay/York off-ramp). Similarly, by removing the existing Logan off-ramp and not providing a new eastbound Gardiner off-ramp at Cherry Street, eastbound traffic on the Gardiner wanting to access Lake Shore Boulevard would need to exit at the existing Jarvis Street off-ramp.

With the elimination of the on/off ramps at Cherry Street, travel times in the AM peak hour would decrease by two minutes for travel from Victoria Park/Finch to Union Station and from Don Mills/Eglinton to Union Station when compared to the travel times for the Hybrid (with new ramps) configuration. This reduction in AM peak-hour travel times for trips coming south along the DVP is a result of the elimination of vehicles entering the Gardiner from the east (either through the existing Logan westbound on-ramp or the proposed new Cherry Street westbound on-ramp), thus allowing for a better flow of traffic and improved travel times from southbound DVP to the westbound Gardiner.

PM peak hour travel times were also modeled with a no new ramps scenario. The results indicate that without the new on/off ramps at Cherry Street, the outbound travel times for the Hybrid option will increase by one minute to the east (to Queen/Woodbine), two minutes to the north (to the DVP at Dundas) and four minutes to the west (to the Gardiner at Spadina), compared to the outbound travel times for the Hybrid option with ramps at Cherry Street. In addition to the impact of outbound trips originating in the study area, the PM peak hour analysis also examined the impact of the Hybrid option (with and without the new ramps at Cherry Street) on trips travelling through the length of the Gardiner-Lake Shore corridor (i.e., not originating in or destined to the downtown area).

The through trip most impacted under the Hybrid option without the new ramps at Cherry Street is the westbound through trip. The model forecasts that a through trip under the

Maintain base case in the PM peak hour starting at Queen/Woodbine would require approximately 10 minutes to travel, via Lake Shore Boulevard and the Logan on-ramp, to a point on the Gardiner at Spadina, for destinations further west. In comparison to the Maintain, if the Hybrid includes a new westbound on-ramp at Cherry Street, an additional one minute of travel time is required to travel, via Lake Shore Boulevard, to the new Cherry Street westbound on-ramp to the Gardiner. Without a new westbound Cherry Street on-ramp, an additional nine minutes is required over the Maintain. This trip would involve travelling on Lake Shore Boulevard to the Jarvis Street on-ramp, which is already congested, enter and merge with Gardiner traffic, and get to a point on the Gardiner at Spadina. Considering the east-to-west through trip in the PM peak hour without new ramps at Cherry Street is forecast to have a significant increase in travel time, a new westbound on-ramp for the Hybrid alternative would appear to be important from a traffic capacity and service perspective.

Westbound Only On-Ramp

The project team also examined the option of constructing a Gardiner westbound onramp east of Cherry Street only (i.e., no new eastbound off-ramp). Instead of being located south of Lake Shore Boulevard along the north edge of the Gardiner, the proposed westbound on-ramp could be located to run along the north side of the realigned Lake Shore Boulevard. The ramp would rise and cross overhead above the boulevard to connect with the elevated Gardiner at Cherry Street.

This Hybrid alignment would avoid redevelopment parcels south of the realigned Lake Shore Boulevard. It would also eliminate the need for the access road and new intersection that would both be required to access the westbound on-ramp for the Hybrid alternative. With a westbound on-ramp only in place, it was determined that while travel times in the AM peak would be similar to those with new ramps in both directions, eastbound travel in the PM peak would be increased significantly for those drivers wanting to access Lake Shore Boulevard east of the Don river. As a result, this concept was not explored further.

Improve Existing Jarvis Westbound On-Ramp

The project team examined the potential to increase the capacity of the existing Jarvis Street westbound on-ramp as a means of reducing travel time delays associated with the implementation of Hybrid without new on/off ramps at Cherry Street, as well as to improve safety conditions at the Jarvis and Lake Shore intersection. The proposal would involve expansion of the westbound on-ramp to two lanes from one. With this modification, it would be possible to move the entrance to the ramp further west from the Jarvis Street / Lake Shore intersection. It may also be possible to remove the southbound right-turn lane onto the existing ramp to normalize the intersection.

Modelling results for the 2031 AM peak hour indicated no travel time benefit from this Jarvis Street on-ramp widening for Hybrid without new ramps at Cherry Street. However, widening the Jarvis westbound on-ramp and improving Lake Shore Boulevard to facilitate a widened on-ramp is expected to offer some remedy to increased travel times of the westbound through trip under PM peak hour conditions. Notwithstanding travel time results, the proposed changes to the existing Jarvis on-ramp, including the access to this ramp, would improve safety conditions at the intersection of Jarvis Street and Lake Shore Boulevard, particularly for pedestrians.

4.4.3.2 Hybrid Alternative

Considering the work undertaken to review alternative Hybrid concepts as described above, the following describes the main elements of the Hybrid alternative developed by the Gardiner East EA project team:

- Rehabilitation of the Gardiner deck east of Cherry Street;
- West of Cherry Street, retention of the existing Gardiner structure/ramps;
- Retention of the existing Gardiner-DVP on/off ramps;
- Removal of the existing Logan on/off ramps (about 750 m of EB lanes and 850 m of WB lanes);
- Rebuilding of Lake Shore Boulevard east of the Don River as a new six-lane landscaped boulevard including planned Broadview extension intersection;
- Construction of one new westbound Gardiner on-ramp and one new eastbound Gardiner off-ramp (each two lanes, about 450 m in length) at Cherry Street (in Keating Channel Precinct);
- Construction of new approach roads to the new on/off Gardiner ramps that run under/north of the Gardiner through the Keating Channel Precinct (within footprint of current westbound Lake Shore Boulevard lanes);
- Extension of Queens Quay east of Cherry Street as a one-lane eastbound roadway;
- Building of new Lake Shore Boulevard/Queens Quay intersection (under DVP ramps);
- Realignment of Lake Shore Boulevard as per the Keating Channel Precinct Plan;
- Extend multi-use pathway along north side of Lake Shore Boulevard; and
- Improvements to some of the existing Lake Shore Boulevard intersections west of Cherry Street.

Figure 4.9 provides a plan view of the Hybrid and **Figure 4.10** shows a rendering looking north-west from the Port Lands.

Figure 4.9: Hybrid Alternative (eastern section)

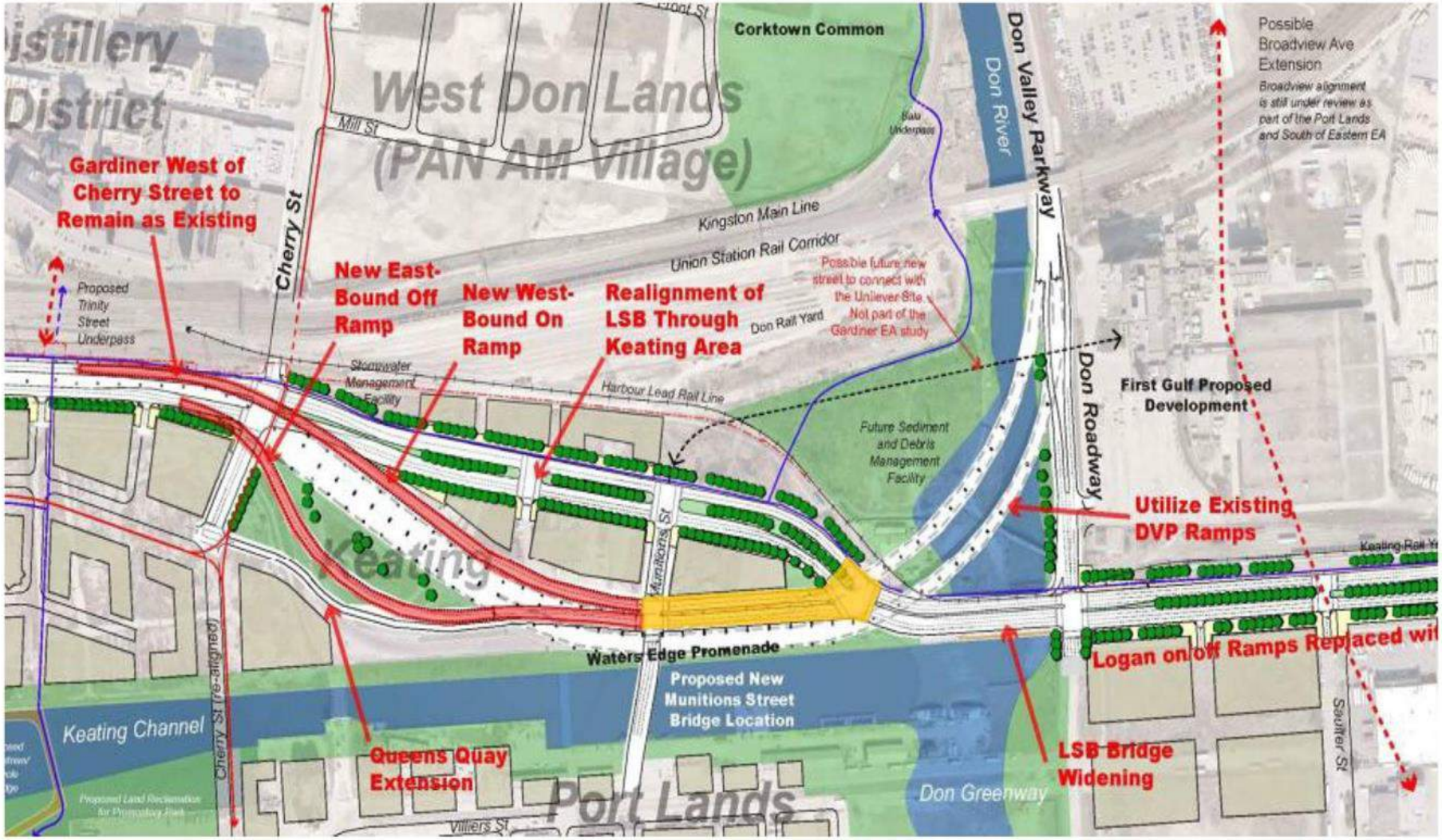


Figure 4.10: Hybrid Alternative (looking north-west from Port Lands)

The transportation model results forecast that the Hybrid would result in travel time increases up to 3 minutes over the future Baseline or Maintain alternative for the selected origin-destination trip pairs. This travel time increase is associated with trips coming from the east in the AM period. Trips originating north and west of the downtown would not be impacted under the Hybrid alternative. Note that even for the Maintain alternative; future auto travel times would increase over current (2014) travel times due to expected population and employment growth in the City.

4.4.4 Additional Studies

In response to PWIC direction to explore potential impacts related to Goods Movement and the City's Economic Competiveness, two additional studies were undertaken by specialist consultant firms. The following summarizes the studies that were undertaken. It is noted that the results of these studies are reflected in the evaluation of the Remove (Boulevard) and Hybrid alternatives.

4.4.4.1 Goods Movement

CPCS (a consulting firm that specializes in goods movement and commercial transportation) was retained to carry out an analysis of goods movement in the Transportation Study Area considered in the Gardiner EA study. The objectives of the goods movement analysis were as follows:

- To provide a better understanding of the nature of goods movement in the Gardiner-Lake Shore corridor/Transportation Study Area.
- To provide a comparative assessment and explanation of the opportunities and constraints for goods movement between the Remove (Boulevard) and the Elevated Expressway alternatives being considered in the EA.
- To recommend high-level mitigation measures for any constraints identified that may be applied to goods movement.

The following provides a summary of the study and the results.

The study involved the review of City traffic count and cordon count data, future modelled travel times, and other available data including:

- **Municipal Property Assessment Corporation zoning data** and Canadian Business Patterns data (from December 2013) used to identify the location of goods movement industries.
- **Ontario Ministry of Transportation (MTO) Global Positioning System (GPS) data** to identify major truck traffic generators. MTO provided GPS-based data on truck stops, which indicate key goods movement origins and destinations (due to confidentiality constraints, this is only available at the county/regional level for this study).
- **MTO iCorridor data**. MTO's iCorridor web application provided data on average speeds of commercial vehicles on roads, including the Gardiner, as well as commercial vehicle counts for 400 series highways.

Furthermore, a large part of this assignment was informed through stakeholder consultations. The purpose of the consultations was to gather information on supply chains and stakeholders' current use of the Gardiner Expressway, likely impacts of the alternatives, and any relevant issues raised by stakeholders. Some issues discussed include the differing impacts of the alternatives by: time of day (peak vs. off-peak movement), local vs. through movements, estimates of the reliability of the road network, and perceived challenges to travel time reliability.

A list of stakeholders was identified through an analysis of Canadian Business Patterns data as well as truck stop data in order to identify areas where larger generators of goods movement flows are located. Several participants had deputed at the Public Works and Infrastructure Committee meeting in 2014. Additionally, industry associations were contacted in order to gain a better understanding of the perspective of stakeholders that may not be located in the Study Area but would be impacted by the Remove (Boulevard) alternative. In some cases, industry organizations recommended particular additional stakeholders that may be significantly impacted by the alternatives.

Stakeholders consulted include key goods movement companies in the Industrial/Manufacturing, Retail and Courier/Logistics industries that could be affected by the implementation of the Remove (Boulevard) alternative.

Key findings of the study are as follows:

Traffic Patterns

- The Gardiner Expressway facilitates some of the largest flows of commercial vehicles in Toronto outside of the 400 series highways; it has been identified by stakeholders as the preferred route for most commercial vehicle trips starting or ending within the EA Study Area.
- The Gardiner Expressway has approximately 40% of the flow of trucks on Highway 401 at Yonge Street during the peak 8:00-9:00am hour and approximately 28% of the flow of trucks at Highway 427 at Dundas Street at the peak 8:00am-9:00am hour.
- For longer distance trips, including those passing through the City of Toronto or those that are not originating in or destined to the Gardiner EA Transportation Study Area (Spadina, Dundas, and Woodbine), the 400 series highways are the preferred routes for commercial vehicle traffic.
- On a wider scale, the Gardiner Expressway/Lake Shore Boulevard Corridor, along with the Don Valley Parkway (DVP), Highway 401 and Highway 427 form a higher speed and higher capacity network around the City that allows for the transportation of goods around the City of Toronto.
- Local traffic is a significant component of all commercial traffic on the Gardiner in the Study Area (80% of truck traffic on the Gardiner either begins or ends in the local study area).
- A large number of truck trip ends currently occur in the southeast corner of the EA Study Area (i.e. Port Lands).

Truck trip patterns by 2031 (EA time horizon) will be affected greatly by development, growth, and changing land use in the Study Area.

Transportation Decisions by Goods Movement Stakeholders

- Transportation decisions of goods movement stakeholders in the Study Area are generally dictated by downstream customer requirements.
- Key factors that goods movement stakeholders consider in transportation decisions are (A) Travel Time, (B) Reliability, and (C) Cost. Goods movement stakeholders value all three factors, but weigh each factor differently depending on the nature of the supply chain in which they operate.
- The main types of goods movement generators using the Gardiner in the study area are categorized into three principal groups (1) Industrial and Manufacturing, (2) Retail, and (3) Courier and Logistics stakeholders.
- Industrial and Manufacturing stakeholders tend to move larger volumes of goods and have a strong focus on cost of transportation. Retail stakeholders often focus on reliability for restocking shelves, and courier services tend to focus on both travel time and reliability in order to meet customer expectations.

Alternatives Assessment Input

Metrics to compare the alternatives considered under the EA were developed based on the supply chain analysis of impacted firms and key concerns raised by stakeholders during consultations. In order to better understand stakeholder feedback received, a framework was developed to convert comments into objective and measurable concerns. These measures were used to evaluate the potential impact of the Remove (Boulevard) and alternatives that included the elevated Gardiner (e.g., the Hybrid).

Considering the above information, an assessment of the alternatives was undertaken on the basis of the following criteria: Travel Time, Travel Reliability, and Cost. This input was considered in the overall evaluation of the alternatives as presented in **Section 4.4.5** below.

4.4.4.2 Economic Competitiveness

To further explore the potential for the Remove (Boulevard) and Hybrid alternatives to impact the City's economic competitiveness, additional study was undertaken by HR&A Advisors. HR&A conducted research and stakeholder consultation beginning in September 2014. HR&A first undertook an evaluation of the importance of Downtown Toronto to the regional economy, recent economic trends in Downtown, and the competitiveness of Toronto when compared to other global cities. HR&A presented this information to stakeholders in December 2014 to

confirm its understanding of Downtown's and Toronto's competitive positioning, factors that drive that competitiveness, and risks to Downtown Toronto. Stakeholders included leading representatives from Toronto's real estate, economic development, and business communities. To fully articulate how the alternatives may affect Downtown's competitive positioning, HR&A synthesized stakeholder feedback and conducted additional industry research on the factors that drive business location decisions. HR&A then isolated those factors that may be affected by the EA alternatives and evaluated the alternatives, using available data. HR&A reviewed its findings with stakeholders in March 2015.

HR&A relied on a combination of third-party research and stakeholder consultation to describe Toronto's relative competitiveness, the importance of Downtown to that position, Downtown's strengths and weaknesses, and more globally the factors that drive business location decisions. The research and findings from the stakeholder consultations represent widely accepted perspectives in the business, real estate, and economic development communities. However, there were varied opinions among stakeholders about the risks to Downtown and what considerations draw businesses to locate and invest in Downtown.

An assessment of potential impacts of each alternative was developed on the basis of the following criteria groups:

1. **Global & Regional Economic Impacts**. These criteria identify the role of the eastern portion of the Gardiner Expressway in the competitive positioning of Downtown Toronto, the economic hub and driver of the City and regional economy, and how the alternatives may affect that competitive positioning. These criteria respond most directly to the additional analysis requested by PWIC to articulate how the alternatives affect the City's economic competitiveness.

2. **Local Economic Impacts.** These criteria identify how the alternatives would impact the Study Area in terms of the potential to create jobs and the marketability of those lands.

3. **Fiscal Net Benefits.** These criteria account for how the alternatives would impact the City's fiscal position by updating HR&A's prior cost-benefit analysis to reflect the latest alternatives and to reflect adjustments in the area.

The economic assessment results of the two alternatives are summarized below and also presented in **Table 4.9,** which presents the assessment results of the alternatives for all the criteria groups.

Table 4.7: Economic Competitiveness Evaluation Inputs

Category	Description	Conclusion
Regional Economics	Impact of alternatives on Toronto's global competitiveness.	The alternatives are unlikely to affect global competitiveness, which is driven by a range of factors, the vast majority of which are unrelated to the alternatives. The alternatives are equally preferred.
	Impact of alternatives on the marketability and competitiveness of Downtown to business.	Remove entails 2-3 minutes higher travel times in AM peak hour and entails a longer construction period which could impact business decisions to locate Downtown. The Hybrid alternative is preferred.
Local Economics	Potential for job creation in the areas adjacent to the alternative alignments, and impact to the marketability of the areas to development.	Both alternatives support the potential for job creation, but the Remove alternative makes more land directly available for development and job creation. The Remove alternative makes available parcels west of Cherry Street; and both alternatives make land available between Cherry Street and the Don River. Both alternatives improve the marketability of the local area, the Remove by enhancing public realm and visibility, and the Hybrid by maintaining convenient and direct highway access. The Remove alternative is preferred.
Fiscal Net Benefits	Potential revenues from the sale of public land and projected lifecycle costs of the alternatives.	The Remove entails lower lifecycle costs and results in more land revenues than the Hybrid alternative. The Remove alternative is preferred.

4.4.5 Evaluation of Boulevard and Hybrid Alternatives

The following presents the alternatives evaluation approach and the results of the Boulevard vs. Remove evaluation.

4.4.5.1 Evaluation Criteria and Approach

The assessment and evaluation of the optimized Remove (Boulevard) and Hybrid alternatives was based on a set of evaluation criteria and measures. The draft criteria were previously presented to the Stakeholder Advisory Committee (SAC) and the public in October 2013 in conjunction with the draft alternative solutions.

Some minor revisions were made to the criteria/measures that were used in the original alternatives evaluation (see Section 4.2). Criteria revisions were made to better clarify what was measured and to accommodate the new information collected through the Goods Movement and Economic Competitiveness studies that were completed (see **Table 4.8** below – criteria/measure changes are indicated in italicized font). There were also a few criteria considered in the previous alternative solutions evaluation that were not considered in this evaluation as they were considered not applicable or found not to be helpful in distinguishing among these two alternatives.

Table 4.8: Evaluation Criteria Groups and Criteria (Updated)

(*italicized font indicate revisions to the criteria*)

Study Lens/Criteria Group	Criteria	Definition
TRANSPORTATION & INFRASTRUCTURE		
Automobiles	Commuter Travel Time (Average travel time for AM peak hour)	Average in-bound peak hour travel time using EMME and PARAMICS model outputs between selected Origin-Destination (OD) pairs.
	Impact on Average Auto Travel Time (peak AM hour) within Downtown/ Primary Transportation Study Area	Change in average peak hour travel times (all directions) in PARAMICS model for local traffic trips within Spadina Avenue and Woodbine Avenue south of Dundas Street.

Study Lens/Criteria Group	Criteria	Definition
	Road Network/ Flexibility Choice	Number of available road network connections that provide drivers with the ability to accommodate planned future transit service.
Transit	Transit Impact	Change in average travel times in PARAMICS model for street cars on Dundas Street, Queen Street and King Street and impact on subway service. Ability to accommodate planned future transit service.
Pedestrians	North-South Sidewalks	Extent, quality and condition of pedestrian connections crossing Lake Shore Boulevard. Walking distance across Lake Shore Boulevard at major north-south streets (e.g., Jarvis Street).
	East-West Sidewalks	Extent, quantity and condition of pedestrian connections along Lake Shore Boulevard.
Cycling	East-West Movement	Extent and quantity of east-west cycling facilities and opportunities to connect with existing and planned north-south cycling facilities.
Movement of Goods	*Travel Time*	*Potential for changes in travel times for the movement of goods. Considers the modelled peak hour travel time results.*
	Reliability	*Additional time expected to be required to ensure that the goods arrive on the scheduled time (buffer index). The importance of reliability depends on the types of goods being delivered.*

Study Lens/Criteria Group	Criteria	Definition
	Transport and Shipper Cost	*Transportation costs can be impacted by a number of factors including mode of transport choice, service standards required, regulations, etc. Increase in travel time increases costs to carriers and transporters (increased fuel consumption, driver time, need for more trucks on the road).*
Safety	*Pedestrians conflict points*	*Traffic exposure risk for pedestrians at intersections and crossing Lake Shore Boulevard considering width/distance of roadway to cross, intersection configuration and sight lines.*
	Cyclist conflict points	*Extent to which cyclists are exposed to free flowing/uncontrolled auto traffic flow. This includes free flowing access ramps to and from the Gardiner Expressway where automobile traffic has the right of way.*
	Motorists conflict points	*Extent to which there are road safety concerns for motorists. Includes poor sight lines and intersection configuration.*
	Safety Risk for Motorists on the Gardiner East	Extent of expressway road geometry that poses safety risk for drivers, particularly lack of shoulders.
Constructability	Duration	Number of years required to complete construction, with an emphasis on the number of years that will result in traffic impacts.

Study Lens/Criteria Group	Criteria	Definition
	Transportation Management	Extent of pedestrian and cycling facilities to be affected during construction. Level of traffic disruption during construction and potential for disruption to other roadways from traffic diversion.
	Construction Impact on Private Property	Extent of private property to be used during construction and potential access to private properties (e.g., driveways) to be impacted.
URBAN DESIGN		
Planning Public Realm	Consistency with Official Plans	Extent to which the principles and recommendations of the Central Waterfront Secondary Plan are accommodated and supported.
	Consistency with Precinct Plans and other initiatives	Extent to which the goals, objectives and recommendations of the East Bayfront and Keating Channel Precinct Plans are accommodated and supported as well the Don Mouth Naturalization Project EA and the Port Lands and South of Eastern TSMP EA Study.
	Streetscape	Quality and consistency of a cohesive street design and character along Lake Shore Boulevard. Considers the balance between hardscape (e.g., paved road surface) and softscape (e.g., landscape, open space, etc.).

Study Lens/Criteria Group	Criteria	Definition
	View Corridors	Visual sight lines within and across the corridor to destinations and landmarks in and surrounding the study area (e.g., views of the water and downtown skyline).
	Amount of Public Realm	Public space that is created for passive and active recreation and leisure, including parks, plazas, streetscapes, etc.
	New Park Land	Surplus right-of-way that could be dedicated as City of Toronto park land that would be usable and programmable above existing baseline.
	Rail Corridor and Berm	Opportunity to minimize the visual and noise impacts of the rail corridor for pedestrians on Lake Shore Boulevard.
Built Form	Street Frontage	Relationship between development and Lake Shore Boulevard at the pedestrian scale. This includes the active at-grade uses in buildings fronting onto Lake Shore Boulevard that may contribute to street character and vibrancy. Also includes the average number of podium floors with obstructed views and limited access to light and air that may limit programming/leasing those floors.

Study Lens/Criteria Group	Criteria	Definition
ENVIRONMENT		
Social & Health	Air Quality	Air quality conditions at the local and regional level, including changes in NOx, VOCs, PM2.5, as well as the level of greenhouse gas emissions.
	Noise	Noise levels at various receptors locations in the study area.
Natural Environment	Terrestrial Environment	Conditions for land based natural habitat, species and features.
	Aquatic Environment	Conditions for aquatic based habitat, species and features.
	Storm Water Quality	On-site capability to treat stormwater and manage the conditions/quality of water run-off.
	Storm Water Quantity	Amount of stormwater run-off potentially generated.
	Microclimate/Heat Island Effect	Local atmospheric conditions related to sunlight, temperature and amount of trees that could grow in the corridor.
Cultural Resources	Built Heritage	Potential for impact on historic physical architecture and cultural property that is inherited and maintained within the corridor.

Study Lens/Criteria Group	Criteria	Definition
	Cultural Landscape	Potential for impact on the existence of a built or natural landscape that is valued by people for its religious, artistic or cultural associations within the corridor.
	Archaeology	Potential for impact on known buried resources or artefacts within the corridor.
	First Nations People and Activities	Potential for impact on the use of the study area by First Nations for traditional purposes.
ECONOMICS		
Global and Regional Economics	*Toronto's Global Competitiveness*	*Influence on change in the global attractiveness of the City of Toronto.*
	Regional Labour Force Access	*Potential for change in level of access to/from the downtown core.*
	Mobility within Downtown	*Potential for change in worker mobility in the downtown core/CBD.*
	Entertainment Venues	*Potential for change in access to major entertainment venues in the downtown (e.g., ACC, Rogers Centre, etc.) and change in their ability to draw visitors.*
Local Economics	Business Activity	Number of jobs created in the study area.

Study Lens/Criteria Group	Criteria	Definition
Direct Cost & Benefit	Capital Cost & Funding	Capital cost to construct the alternatives in 2013$, including the cost to acquire private property (if required). The funding is currently available in the City budget for rehabilitation.
	Lifecycle Cost	Net present value of construction cost and 100-year operations and maintenance costs of the alternative.
	Land Value Creation	Amount of money that could be generated through the creation and sale of new land for the City.

4.4.5.2 Effects Assessment and Evaluation Approach

Data for each of the alternatives was collected on the basis of the evaluation criteria as presented in **Table 4.8** above and in **Table 4.9** presented further below. To compare the advantages and disadvantages of the alternatives, both construction effects and long-term operations effects were identified and assessed based on the criteria and measures. Considering this data, alternative preference rankings were then determined for each measure and these rankings were then considered to generate alternative preference rankings by criteria group. It is not unusual in EA studies to not have an alternative that is preferred for all the evaluation criteria. As such, when comparing among alternatives, there are often trade-offs that need to be made to select the technically preferred alternative. As both quantitative and qualitative data was collected, the evaluation of the two alternatives was undertaken using a "reasoned argument" approach. The reasoned argument approach involves the use of data as well as the consideration of public, stakeholder and agency input to identify reasoned judgements to support a preference or decision.

4.4.5.3 Consideration of Public Input

Consultation activities associated with the development and evaluation of the optimized Remove (Boulevard) and Hybrid alternatives were focused on the engagement of the SAC, the holding of two public meetings (April 15th and 20th, 2015) with a live web cast of the April 15 event, the release of the presentation package on the project web site, and an open comment period following the public meetings. Including web site visits, close to 8,500 people were in some way engaged in consultation activities in this fourth round. The details of the

consultation activities are documented in **Appendix B, Record of Consultation**. The key questions asked at the consultation events were:

- Public Works and Infrastructure Committee and Toronto City Council will soon consider what to do with the Gardiner East. Thinking about the results of the additional work and updated evaluation:
    - What are the most important considerations in making this decision?
    - What other advice do you have on making a decision that involves finding a balance among diverse priorities?
    - Other comments?

A summary of key public commentary on the alternatives is presented below:

Remove (Boulevard) Alternative

Participants who indicated support for the Remove (Boulevard) alternative typically provided the following reasons:

- Contributes to broader city building goals;
- Improves the public realm for a variety of users;
- Presents the most cost-effective solution;
- Improves urban design in the study area;
- Reconnects the City to the waterfront;
- Frees land for future development;
- Integrates transit and active forms of transportation;
- Replaces out-dated infrastructure;
- Increases traffic time marginally.

Hybrid Alternative

Participants who indicated support for the Hybrid alternative generally provided the following reasons:

- Does not decrease road capacity;
- Does not significantly increase travel time or add to congestion;

- Maintains a continuous expressway connection between the east and west ends of the City and into the downtown core;
- Supports the movement of goods and the transportation needs of local businesses;
- Enhances safety better than the Remove (Boulevard) alternative.

Concerns about projected increases in travel times, safety, impacts from construction, assumptions about public transit and the potential for future development were expressed by participants about both alternatives.

4.4.5.4 Comparative Evaluation of Alternatives

The following provides a description of the differences between the two alternatives within each of the four evaluation lenses. Data for all the criteria groups are available in **Table 4.9**. The process to generate the data and the interpretation of the data is similar to that previously outlined in Section 4.2.

Table 4.9: Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid
A. Transportation & Infrastructure	A.1 Automobiles	A 1.1 Commuter Travel Time (Modeled average travel time for AM Peak Hour) Note: Transportation demand based on regional projections for growth expected by 2031 in addition to full build-out of East Bayfront, Keating, Port Lands expected to occur over a 40-50 year timeline.	Average travel times between representative Origins and Destinations	Less Preferred - Generates higher peak hour modeled auto travel times.	Preferred - Generates lower peak hour modeled auto travel times.
			Don Mills to CBD - Don Mills/ Eglinton to Front/ Bay [B-D]	33 minutes	30 minutes
			Scarborough to CBD - Victoria Park/ Kingston to Front/ Bay [C-D]	28 minutes	26 minutes
			Etobicoke to CBD - Kipling/Lake Shore to Front/Bay [E-D]	49 minutes	46 minutes
			North York to CBD - Victoria Park/ Finch to Front/ Bay [A-D]	55 minutes	52 minutes
			Auto travel time sensitivity to future transit scenarios	Equally Preferred - Similar increases in travel times without planned transit projects.	Equally Preferred - Similar increases in travel times without planned transit projects.
		A 1.2 Impact on Average Auto Travel Time (AM peak hr.) Within Downtown/ Transportation Study Area	Total Volume Assigned (reflects available road capacity)	Equally Preferred - 70,500 vph	Equally Preferred - 70,500 vph
			Percentage of vehicles experiencing increases in travel time over the future Base Case/Maintain.	Less Preferred - More vehicles per hour impacted for more than 2 minutes	Preferred - Less vehicles per hour impacted for more than 2 minutes
			<2 min	75% (46,000 vph)	90% (64,500 vph)
			>2 min	25% (17,000 vph)	10% (7,000 vph)
			Trip Reduction/Diversion	Equally Preferred - Approx. 15%	Equally Preferred - Approx. 15%
			Overall impact on auto travel in Downtown	Less Preferred - Generates the higher modeled peak hour auto travel times.	Preferred - Generates lower modeled peak hour auto travel times.
		A 1.3 Road Network Flexibility/ Choice	Turning prohibitions at key intersections Existing Jarvis Street: 4 prohibitions Sherbourne Street: 2 prohibitions Parliament Street: 1 prohibition Cherry Street: 2 prohibitions Don Roadway: 3 prohibitions	Equally Preferred - Both options are significantly better than existing. Cherry Street: 2 prohibitions (SB left & NB right prohibited)	Equally Preferred - Both options are significantly better than existing. Jarvis Street: 1 prohibition (WB left prohibited)
	Automobiles Summary Ranking			Less Preferred	Preferred
	A.2 Transit	A 2.1 Transit Impact	Impact on surface transit service	Less Preferred – Minor travel time impacts on surface transit when compared to the base case	Preferred – Essentially same as the base case
			Impact on subway service	Equally Preferred - No impact to subway transit	Equally Preferred - No impact to subway transit
			Ability to accommodate planned transit service	Equally Preferred – Accommodates same planned transit projects and provides similar flexibility in transit planning east of the Don River (e.g. Broadview Extension).	Equally Preferred – Accommodates same planned transit projects and provides similar flexibility in transit planning east of the Don River (e.g. Broadview Extension).
	Transit Summary Ranking			Equally Preferred	Equally Preferred

Table 4.9: Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid
	A.3 Pedestrians	A 3.1 North-South Sidewalks	Ability to physically implement City standard north-south sidewalks for use by the local community and travelers.	Preferred – Reconstruction of the corridor allows for sidewalks to be built to City standards for all intersections along the entire length of Lake Shore Boulevard.	Less Preferred – Improvements not possible at all north-south crossings.
				Preferred – Reconstruction of the corridor allows for city standard crosswalks to be built on both the east and west side of the street .	Less Preferred – Improvements and standardization possible at some intersections. However, existing constraints do not allow standardization of crosswalks on both the east and west side of the street for all intersections.
			North-South Crosswalk Locations at Lake Shore Blvd.		
			Jarvis Street	East and West	East and West (non-standardized)
			Sherbourne Street	East and West	East and West (non-standardized)
			Parliament Street	East and West	East and West
			Cherry Street	East and West	East and West
			Don Roadway	East	East
			Broadview Avenue	East and West	East and West
			Bouchette Street	East and West	East and West
			Logan Avenue	East and West	East and West
			Carlaw Avenue	East and West	East and West
			North-south crosswalk crossing distance at Lake Shore Boulevard (W = westside crossing, E = eastside crossing)	Preferred - crossing distance ranges from 25 - 39 metres	Less Preferred - crossing distance ranges from 25 - 55 metres.
			Jarvis Street	37.7m W, 37.4m E	44.6m W, 44.6m E
			Lower Sherbourne Street	37.5m W and E	46.9.8m W, 55.1m E
			Parliament Street	38.5m W, 38.9m E	37.05m W, 31.5m E
			Cherry Street	39m W, 36.2m E	38.1m W, 33.7m E
			Don Road	Not available W, 29.6m E	Not available W, 29.6m E
			Broadview Avenue/ Saulter Street	25.8m W and E	25.8m W and E
			Bouchette Street	25.8m W and E	25.8m W and E
			Logan Avenue	26.9m W, 27.8m E	26.9m W, 27.8m E
			Carlaw Avenue	28.8m W, 31.3m E	29.9m W, 31.3m E
		A 3.2 East-West Sidewalks	Ability to physically implement City standard east-west sidewalks as measured by length along the corridor for use by the local community and travelers (Yonge to Logan).	Preferred - Reconstruction of the corridor allows for sidewalks to be built to City standards along the entire length of Lake Shore Boulevard for use on the north and south sides of Lake Shore Boulevard. 5,600 total linear metres of city-standard sidewalk.	Less Preferred – Sidewalks on the north side of Lake Shore Boulevard are not possible between Yonge and Parliament St due to physical limitations of on/off ramps. 2,700 total linear metres of city-standard sidewalk.
	Pedestrians Summary Ranking			Preferred	Less Preferred

Table 4.9: Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid
	A.4 Cycling	A 4.1 East-West Movement	Length of facility	Equally Preferred – Total length of cycling facility is 4,200 m in length between Leslie Street to Yonge Street.	Equally Preferred – Total length of cycling facility is 4,200 m in length between Leslie Street to Yonge Street. While it is assumed that the cycling facility can be extended west of Jarvis in the Hybrid, this is being confirmed through a separate study by the City.
			Connectivity with other planned and existing bikeway facilities Existing cycling facilities · Yonge Street · Sherbourne Street · Martin Goodman Trail (east of Parliament) Planned cycling facilities · Trinity Street · Cherry Street	Equally Preferred – New facility can connect with all existing and planned facilities.	Equally Preferred – New facility can connect with all existing and planned facilities. While it is assumed in the Hybrid that the cycling facility can be extended west of Jarvis, this is being confirmed through a separate study.
	Cycling Summary Ranking			Equally Preferred	Equally Preferred
	A.5 Movement of Goods	A 5.1 Travel Time	Modelled Average Travel Time (impact to Truck Movements)	Less Preferred – Vehicle travels times expected to be 2-3 minutes greater than the Hybrid for the AM peak hour period which has potential for delay to truck traffic during peak period travel.	Preferred – Vehicle travels times expected to be 2-3 minutes less than the Remove for the AM peak hour period which has potential for delay to truck traffic during peak period travel.
			Impact of Construction	See Construction Impact	See Construction Impact
		A 5.2 Reliability	Change in overall travel speeds in corridor due to incident	Equally Preferred: Reduction of 2 km/hr. for incident modelled on LSB (between Jarvis and Sherbourne).	Equally Preferred: Reduction of 0.5 km/hr. for incident on LSB and reduction of 4.5 km/hr. for modelled incident on the Gardiner (between Jarvis and Sherbourne).
			Change in traffic volumes through corridor due to incident	Equally Preferred: Reduced volume of 1,685 vehicles for modelled incident on LSB.	Equally Preferred: Reduced volume of 368 vehicles for modelled incident on LSB and 2,211 vehicles for an incident on the Gardiner.
		A 5.3 Transport & Shipper Cost	Transport & Shipper Cost	Less Preferred: Longer vehicle travel times may result in higher transport and shipper costs than the Hybrid.	Preferred: Shorter vehicle travel times may result in lower transport and shipper costs than the Remove.
	Movement of Goods Summary Ranking			Less Preferred	Preferred

Table 4.9: Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid
	A.6 Safety	A 6.1 Pedestrian Conflict Points	Risk Exposure for pedestrians at intersections: - road crossing length - presence of free turns - presence of poor sight lines	Preferred – Shorter crossing length, normalized intersections and removal of Gardiner columns that improves sight lines. Greater volume of traffic will be on an at-grade street, design speed will be lower and road can be designed to accommodate expected volume to meet safety standards.	Less Preferred – Longer crossing lengths, greater number of free turns and poor sight line conditions remain.
		A 6.2 Cyclist Conflict Points	Potential for conflict points (e.g. crossing of free flow turns/ ramps)	Preferred – Eliminates all free flow right turns and removal of Gardiner columns improves sight lines.	Less Preferred– Number of free turns is expected to be reduced compare to Base Case, however sight line issues still exist at certain intersections.
		A 6.3 Motorist Conflict Points	Potential conflict points/safety concerns at Lake Shore Blvd. intersections <u>Existing</u> Lake Shore Blvd./Jarvis – short merge for E/B on-ramp Lake Shore Blvd./Jarvis – short diverge for W/B on-ramp Lake Shore Blvd./Jarvis – poor sightlines for Gardiner Expressway W/B on-ramp Lake Shore Blvd./Sherbourne – poor sightlines for S/B RT Lake Shore Blvd./ Don Roadway – speed differential for merge between E/B and N/B RT Lake Shore Blvd./ Don Roadway – unexpected conflict between S/B and Martin Goodman Trail	Preferred – Eliminates existing road safety concerns at Jarvis Street, Sherbourne Street, and the Don Roadway.	Less Preferred – A number of intersections and road segments along Lake Shore Blvd. have been identified on the City's top 20% list of roadways in need of improvement based on collisions from 2007 to 2011. The existing Gardiner columns result in poor sight line conditions that potentially contribute to higher rates of incidents on this roadway. Hybrid maintains these columns.
		A 6.4 Safety Risk for Motorists on Gardiner Expressway	Gardiner expressway geometry	Not Applicable	Less Preferred – Gardiner Expressway shoulders not to standard
	Safety Summary Ranking			Preferred	Less Preferred
	A.7 Construction Impact	A 7.1 Duration	Length of construction period Note: Opportunity to reduce construction periods can be studied, the feasibility and costs of which need to be assessed during the Alternative Design phase of the Environmental Assessment.	Less Preferred – It is expected that a 5 to 6 year construction period will be required. Approximately 3 years of direct impact on expressway lanes. 1.5 years per direction. Rolling Lake Shore Blvd. lane closures will be required. Removal of the Expressway and the rebuild of LSB will at times require the temporary detouring of traffic away from the corridor (one direction at a time). The period requiring detour roads is greater than for Hybrid.	Preferred – This alternative includes the City's program to re-deck this section of Gardiner resulting in approximately 6 years of direct impact on expressway lanes. Rolling Lake Shore Blvd. lane closures are also expected for deck replacement. Given reduction of capacity, traffic delay is anticipated throughout this period. It is expected that the new on/off ramps in Keating area can be built while maintaining traffic flow. Removal of the Logan ramps will require the temporary detouring of EB and WB traffic away from LSB. The length of period requiring detour roads is much less than for Remove.

Table 4.9: Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid
		A 7.2 Transportation Management	Potential impact to pedestrian/ cycling infrastructure during construction	Equally Preferred – It is assumed that all pedestrian/cycling infrastructure can be largely maintained during construction.	Equally Preferred – It is assumed that all pedestrian/cycling infrastructure can be largely maintained during construction.
			Capacity to accommodate traffic flows through corridor during construction	Less Preferred – Will be periods that the corridor is not available for traffic and will require the use of detour roads based on the proposed staging scheme. It is expected that detouring of traffic may be required for up to 3-4 years. East of Don River both options will require diversion when Logan ramps are removed.	Preferred – It is expected that traffic flows can largely be accommodated through corridor during construction. East of Don River both options will require traffic diversion when Logan ramps are removed.
			Potential off-site traffic disruption during construction	Less Preferred – Off-site disruption is expected to be greater than Hybrid as greater amount of traffic diversion to other roadways is expected to be required.	Preferred – Off-site disruption is expected to be less than Remove as less amount of traffic diversion to other roadways is expected to be required.
		A 7.3 Private Property	Potential need for private property for construction staging/ detours	Less Preferred – Potential private property needs during construction. To be confirmed subject to the development of more detailed design.	Preferred – None expected
			Potential property/ access disruption during construction	Less Preferred – Greater potential to impact private property, depending on final road detour plan.	Preferred – None expected
	Construction Impact Summary Ranking			Less Preferred	Preferred
OVERALL RATING: TRANSPORTATION & INFRASTRUCTURE				LESS PREFERRED	PREFERRED
B. Urban Design	B.1 Planning	B 1.1 Consistency with Official Plans	Consistency with approved Central Waterfront Secondary Plan principles: 1) Removing Barriers; 2) Building a Network of Spectacular Waterfront Parks and Public Spaces; 3) Promoting a Clean and Green Environment; and 4) Creating Dynamic and Diverse New Communities to support residential and employment growth along the Gardiner/ Lake Shore Blvd corridor.	Preferred – Fully achieves the Central Waterfront Secondary Plan principles improving north-south crossings, implementation of continuous trail, adding park space, creating a tree-lined urban boulevard, creating right-of-way infrastructure to support transportation, community and neighbourhood objectives.	Less Preferred –Minimally achieves the Central Waterfront Secondary Plan principles given existing physical constraints and opportunities for improvements.
		B 1.2 Consistency with Precinct Plans and Other Initiatives	Consistency with approved East Bayfront, Keating, Port Lands, Don Mouth Naturalization, South of Eastern and other plans and land use goals which define standards for high quality and high value urban development.	Preferred – Fully realizes all approved Precinct Plans.	Less Preferred – There are negative effects on the Keating Precinct Plan due to the new ramps and new access road between Cherry and Lake Shore Blvd.
	Planning Summary Ranking			Preferred	Less Preferred

Table 4.9: Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid
	B.2 Public Realm	B 2.1 Streetscape	Quality of place along Lake Shore Boulevard	Preferred - Urban boulevard design, familiar road geometries, human-scale fixtures, standard city finishes, full sun exposure, no noise amplification, unobstructed views and clear sight lines to destinations create a comfortable and easily navigable environment	Less Preferred - Minimal improvements to intersections with free turns, irregular road geometries, scale of fixtures, and quality of finishes create an only slightly less unattractive and disorienting environment than at present. Removal of Logan on/off ramp east of the Don River allows for the creation of a new 6-lane Lake Shore Blvd. with the same benefits of the Remove option for this segment.
			Consistent and cohesive character from east to west on Lake Shore Boulevard	Preferred - Consistent conditions and only minor variations in width enable a consistent character to be achieved along the length of the corridor	Less Preferred – Varying conditions and widths across the length of the corridor make cohesive character impossible to achieve. Creation of a new Lake Shore Blvd. east of the Don River improves part of the corridor but not its entire length.
			Ratio of hardscape to softscape surfaces in the corridor	Preferred - 83% hardscape, 17% softscape	Less Preferred - 88% hardscape, 12% softscape
		B 2.2 View Corridors	Quality of north-south visual connections between downtown and the waterfront	Preferred - Removes all visual barriers	Less Preferred - No opportunity to mitigate the visual barrier of the Gardiner columns and elevated deck except at Don River.
			Quality of east-west visual connections between the east end and the financial core on Lake Shore Boulevard	Preferred - Fully opens up all the skyline views from Lake Shore Blvd.	Less Preferred - No opportunity for skyline views from Lake Shore Blvd. Gardiner structure remains except at Don River.
		B 2.3 Amount of Public Realm	Usable public realm area in the Lake Shore Blvd corridor, including pedestrian areas, patios, passive recreation, multi-use trails and streetscaping. (Yonge to Logan).	Preferred – Reconstruction of the corridor allows for most public realm area to be created. Approximately 18 acres.	Less Preferred – New public realm space limited to east of Don River along Lake Shore Boulevard. Approximately 14 acres.
		B 2.4 New Park Land	Surplus right-of-way that could be dedicated as City of Toronto park land that would be usable and programmable above existing baseline.	Equally Preferred – There is not a meaningful difference of parkland creation between the two options in the Keating Precinct within the current Gardiner right-of-way.	Equally Preferred – There is not a meaningful difference of parkland creation between the two options in the Keating Precinct within the current Gardiner right-of-way.
		B 2.5 Rail Corridor and Berm	Length of the CN rail corridor exposed to the public sidewalk and open space along Lake Shore Boulevard	Preferred – Proposed north side buildings provide a buffer to LSB (330 metres buffer Jarvis to east of Sherbourne).	Less Preferred – No additional buffering of rail corridor from Lake Shore Blvd.
	Public Realm Summary Ranking			Preferred	Less Preferred

Table 4.9: Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid
	B.3 Built Form	B 3.1 Street Frontage	Length of leasable, active, at-grade space supported by the design of the corridor on Lakeshore Boulevard (North & South frontage)	Preferred – Removal of elevated structure will allow for entire corridor to be developed for retail and active uses. Total 3,812 linear metres of frontage (approximately 80% of corridor length).	Less Preferred – Presence of elevated structure along most of the corridor will limit retail and active uses. Total 896 linear metres of frontage (approximately 15% of corridor length).
			Number of podium floors with obstructed views, limited access to light and air and expressway impacts due to proximity of elevated structure	Preferred - Removal of Gardiner would result in no obstructed views to podiums floors and allows access to light and air.	Less Preferred - Existing Gardiner height of approximately 10 metres (west of Cherry) and 15 metres (east of Cherry) will negatively impact the lower 4–7 building storeys. Removal of the elevated Logan on/ off ramp resulting in an improved Lake Shore Blvd. east of the Don River.
	Built Form Summary Ranking			Preferred	Less Preferred
OVERALL RATING: URBAN DESIGN				PREFERRED	LESS PREFERRED
C. Environment	C.1 Social & Health	C 1.1 Air Quality	Extent of change in regional air quality (NOx, VOC, & PM2.5)	Equally Preferred – Modeling results indicate similar regional emissions relative to the Hybrid. Regional burden of 0.0038%.	Equally Preferred – Modeling results indicate similar regional emissions relative to the Remove. Regional burden of about 0.0037%.
			Extent of change in local air quality (NOx, VOC, & PM2.5)	Preferred – Previous modeling results indicate that a lower concentration of local emissions (NOx) would exist due to lower volumes of vehicles in the corridor.	Less Preferred- Based on previous modeling results, a higher concentration of local emissions (NOx) is expected for the Hybrid due to higher volumes of vehicles in the corridor.
			Level of Greenhouse Gas Emissions	Preferred – Modeling results indicate similar levels in GHG emissions. Regional burden of 0.28%	Less Preferred – Modeling results indicate similar levels in GHG emissions. Regional burden of 0.31%.
		C 1.2 Noise	Extent of change in noise levels Note: noticeable differences in the predicted noise levels are mainly for the receptors in close proximity to the Gardiner Expressway/Lake Shore Blvd. corridor.	Equally Preferred – Alternative is expected to have slightly lower noise levels in the Gardiner corridor as a result of lower volume of traffic in corridor but there is potential for increased noise levels on other City streets due to traffic diversion on other streets. While the relative increase in noise is higher in the corridor, most of the receptors potentially affected are future receptors and would relocate to the corridor with knowledge of the roadway/traffic conditions.	Equally Preferred – Alternative is expected to have higher noise levels in the Gardiner corridor but lower noise levels on other City streets as traffic diversion is less. The greatest change is expected to be along the corridor. Changes on other City streets are expected to be minor to moderate.
	Social & Health Summary Ranking			Preferred	Less Preferred

Table 4.9: Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid
	C.2 Natural Environment	C 2.1 Terrestrial Environment	Potential to create new terrestrial/ habitat/ natural features	Equally Preferred – Neither alternative has potential for creation of meaningful new terrestrial habitat.	Equally Preferred – Neither alternative has potential for creation of meaningful new terrestrial habitat.
		C 2.2 Aquatic Environment	Potential to create new aquatic habitat	Preferred - Relocation of all road infrastructure along the Keating Channel will allow for improved runoff control into the Keating Channel. This may provide for some improvement of aquatic habitat in the Keating Channel. Both solutions facilitate the Don Mouth Naturalization Project.	Less Preferred - Although relocation of Lake Shore Blvd. through Keating Precinct will allow for improved runoff control into the Keating Channel, the Hybrid maintains the existing Gardiner and introduces on/off ramps and the approach road near the Keating Channel which could affect the potential to improve aquatic habitat through increased road run-off. Both solutions facilitate the Don Mouth Naturalization Project.
		C 2.3 Storm Water Quality	Ability to treat stormwater on-site/at source	Preferred – redesigning the entire roadway at grade allows for the potential to integrate stormwater management and water quality features that are not available unless the road is reconstructed.	Less Preferred – The new Lake Shore Blvd. alignment in Keating Precinct could be designed to improve treatment of stormwater and water quality. East of Don River redesign of LSB has potential to integrate stormwater management and water quality features that are not available unless road is reconstructed.
		C 2.4 Storm Water Quantity	Area of paved surface (higher number equates to more surface water run-off)	Preferred – 84,575 sq. m. of paved surface.	Less Preferred – 125,074 sq. m. of paved surface.
		C 2.5 Microclimate/Heat Island Effect	Access to natural sunlight in the corridor and tree canopy coverage (which can encourages active transportation. reduces urban heat island effect, improve air quality, increase evapotranspiration)	Preferred – With no elevated structure through the corridor there is full access to sunlight and opportunities for tree planting are greatly increased due to increased sunlight which will result in the greatest tree canopy. (1,237 new trees estimated providing 52% coverage in corridor).	Less Preferred – Elevated structure west of Don River remains. Removal of Logan ramps east of Don River provides full access to sunlight through this section. Some improved opportunity for new trees west of Cherry Street and east of Cherry along new Lake Shore Blvd. alignment and east of Don River due to Logan ramp removal. (326 new trees estimated – 12% coverage in corridor)
Natural Environment Summary Ranking				Preferred	Less Preferred

Table 4.9: Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid
	C.3 Cultural Resources	C 3.1 Built Heritage	Direct impact on built heritage features	Equally Preferred: Based on available documentation, no built heritage features within existing or proposed right-of-way.	Equally Preferred: Based on available documentation, no built heritage features within existing or proposed right-of-way.
		C 3.2 Cultural Landscape	Direct impact on cultural landscapes	Equally Preferred: Based on available documentation, no cultural landscapes within or adjacent to the existing or proposed right-of-way.	Equally Preferred: Based on available documentation, no cultural landscapes within or adjacent to the existing or proposed right-of-way.
		C 3.3 Archaeology	Potential for impact on archaeological resources *Note all alternatives result in impact from New Lake Shore Blvd. alignment east of Cherry. Potential effects on three archaeological features:* *Toronto Dry Dock* *Toronto Iron Works* *British American Oil*	Less Preferred: Greater amount of excavation results in increased potential for disturbance to known features. Potential effects on 9 archaeological wharf related features: • circa 1893-1925 Yonge Street Wharf • circa 1893-1925 City Wharf • circa 1893-1925 Toronto Electric Light Co. wharf • circa 1870 Don Breakwater • circa 1900 Don Mouth Fill Limit • circa 1910-1926 Polson Iron Works Wharf • circa 1910-1926 City Corp. Wharf • Knapp's Roller Boat • National Iron Works	Preferred: minor disturbances possible from widen westbound Gardiner off Ramp (Relocate Piers) East of Sherbourne - Potential effects on one archaeological feature: • circa 1910-1926 City Corporation Wharf
		C 3.4 First Nation People and Activities	Potential impact on lands used for traditional purposes	Equally Preferred: No impact anticipated.	Equally Preferred: No impact anticipated.
	Cultural Resources Summary Ranking			Less Preferred	Preferred
OVERALL RATING: ENVIRONMENT				PREFERRED	LESS PREFERRED
D. Economics	D.1 Global & Regional Economics	D 1.1 Toronto's Global Competitiveness	Potential for change in Toronto's Global Competitiveness	Equally Preferred – Based on the City's high global ranking, the anticipated increase in travel times and the relative small proportion of commuters expected to be affected by the increase, and the fact that accessibility is only one of many considerations factored into assessing competiveness, neither option is expected to have an impact on the City's global economic competitiveness.	Equally Preferred – Based on the City's high global ranking, the anticipated increase in travel times and the relative small proportion of commuters expected to be affected by the increase, and that accessibility is only one of many considerations factored into assessing competiveness, neither option is expected to have an impact on the City's global economic competitiveness.

Table 4.9: Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid
		D 1.2 Regional Labour Force Access	Potential for change in Regional Labour Force Access to downtown	Less Preferred – While 95% of new commuter trips to the downtown will be on transit, the additional auto travel times could impact employers and employees decisions to locate/work downtown as compared to other regional employment centres.	Preferred – Change to the regional attractiveness of downtown Toronto is not expected to change.
		D 1.3 Mobility within Downtown	Potential for change in mobility within Downtown	Equally Preferred – With an increased reliance on transit, walking and cycling in the downtown, neither option is expected to have a meaningful impact on downtown mobility.	Equally Preferred – With an increased reliance on transit, walking and cycling in the downtown, neither option is expected to have a meaningful impact on downtown mobility.
			Disruption During Construction	Less Preferred – While the total period of construction is similar, the Remove will result in more traffic delay during construction that could result in greater economic impacts.	Preferred – While the total period of construction is similar, the Hybrid will result in less traffic delay during construction and thus has less potential economic impacts.
		D 1.4 Entertainment Venues	Potential for change in access and attractiveness to downtown entertainment venues.	Equally Preferred - The City's downtown venues are highly accessible by public transit. Further, there is typically minimal overlap with peak commuter travel times and travel to the entertainment venues. It is unknown if patrons that use the Gardiner Expressway to visit Downtown's venues will face higher travel times in one EA alternative versus the other. Regardless, information on the sensitivity of a customer's willingness to attend an event due to changes in travel time is unavailable.	Equally Preferred - The City's downtown venues are highly accessible by public transit. Further, there is typically minimal overlap with peak commuter travel times and travel to the entertainment venues. It is unknown if patrons that use the Gardiner Expressway to visit Downtown's venues will face higher travel times in one EA alternative versus the other. Regardless, information on the sensitivity of a customer's willingness to attend an event due to changes in travel time is unavailable.
Global and Regional Economics Summary Ranking				Less Preferred	Preferred
	D.2 Local Economics	D 2.1 Business Activity	Number of potential new jobs in corridor and/or study area	Preferred – as about 2,000 more jobs expected to be generated in the corridor over the Hybrid. But both options support the First Gulf development that is projected to generate in excess of 25,000 new jobs	Less Preferred – less new local jobs than the Remove. But both options support the First Gulf development that is projected to generate in excess of 25,000 new jobs
Local Economics Summary Ranking				Preferred	Less Preferred

Table 4.9: Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid
	D.3 Fiscal Net Benefits	D 3.1 Capital Cost and Funding	Total capital cost (in 2013$)	Preferred $326 million (2013$) Includes demolition and removal of the existing Gardiner Expressway and 8-lane Lake Shore Blvd. construction and major urban design and landscaping throughout and construction of new bridge structures across Don River to connect to Lake Shore Blvd. and Don Valley Parkway.	Less Preferred $414 million (2013$) Includes demolition and removal of the Gardiner Logan ramps and rebuild of a new at-grade 6-lane boulevard. Building of new on and off ramps and connecting roads in the Keating areas and modifications to the Gardiner to accommodate these ramps and Construction of new bridge structures across Don River to connect to Lake Shore Blvd. and Don Valley Parkway.
			Property acquisition	Equally Preferred Minimal property requirements around the Don Roadway/DVP connection.	Equally Preferred Minimal property requirements around the Don Roadway/DVP connection.
			Funding Availability	Preferred $342 ($2013) Capital is availble (Yonge to Logan Ramps). Less additional Capital funding required over budget.	Less Preferred $342M ($2013) Capital is available (Yonge to Logan Ramps). More additional Capital funding required over budget.
		D 3.2 Lifecycle Cost	100 year life cycle cost (includes total capital cost + 100yr operations and maintenance cost) *Figures are +/- 20%	Preferred - $461M 2013$ ($326M Capital + $135M Operations and Maintenance) $240M NPV ($221M Capital + 19M Operations and Maintenance)	Less Preferred - $919M 2013$ ($414M Capital + $505M Operations and Maintenance) $336M NPV (260M Capital + $76 M Operations and Maintenance)
		D 3.3 Public Land Value Creation	Public Land disposition proceeds. All figures +/- 10%	Preferred $176 million (2013$) $128 million (NPV) (31 acres of public land) These values are for land west of Don River only. East of Don River, both alternatives would have equal benefit. The amount of this benefit is subject to development plans but is expected to be in excess of $100M.	Less Preferred $39 million (2013$) $29 million (NPV) (19 acres of public land) These values are for lands west of Don River only. East of Don River, both alternatives would have equal benefit. The amount of this benefit is subject to development plans but is expected to be in excess of $100M.
		D 3.4 Total Net Benefit	Net 100 Year Life Cycle Cost after land revenues.	Preferred $285 million (2013$) Net Cost $112 million (NPV) Net Cost	Less Preferred $880 million (2013$) Net Cost $307 million (NPV) Net Cost
	Direct Cost and Benefit Summary Ranking			Preferred	Less Preferred
OVERALL RATING: ECONOMICS				PREFERRED	LESS PREFERRED

Table 4.9: Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid
Study Goals Achievement	Revitalize the Waterfront			Preferred	Less Preferred
	Reconnect the City with the Lake			Preferred	Less Preferred
	Balance Modes of Travel			Preferred	Less Preferred
	Achieve Sustainability			Preferred	Less Preferred
	Create Value			Preferred	Less Preferred
Summary				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 also less. Negative impacts are primarily related to slightly longer auto travel times for those continuing to choose this form of transportation to access the downtown.	Partially addresses some of the negative impacts of the existing infrastructure while largely maintaining auto capacity and expressway functionality. Does not lead to transformation of the corridor west of Cherry St. 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.

Transportation and Infrastructure Lens

The following provides commentary on two criteria groups within this lens: Automobiles and Constructability, as these two issues received much attention by stakeholders and are key considerations within this evaluation lens.

Automobiles Criteria Group

This criteria group considered three criteria: 1) Commuter Travel Time based on average AM peak hour auto in-bound travel times for select origin-destination (OD) pairs; 2) Impact on Average Auto Travel Time based on average AM peak hour auto travel times within the transportation study area (roughly bounded by Spadina, Dundas, Woodbine and Lake Ontario); and 3) Road Network Flexibility/Choice represented by the number of turning prohibitions.

Traffic forecasting for the Gardiner Expressway EA was undertaken for a 2031 horizon year for AM commuter peak hour conditions. The transportation modelling process used an integrated application of City of Toronto's regional planning model (in EMME/2 software) and a detailed operations model (in Paramics software) developed specifically for the project.

The EMME model provided the regional perspective on travel demand forecasting. It was used to forecast demands in the primary travel modes for existing and 2031 conditions for the two alternative solutions (Remove (Boulevard) and Hybrid). The EMME model accounts for the impacts of major road and transit infrastructure projects; growth in population and employment levels; and changes in travel patterns due to the new residential and employment areas expected to develop across the City (e.g., development of Lower Yonge, Keating, Don Lands, Port Lands will increase percentage of employees who live downtown).

The PARAMICS model (a micro-simulation model) was used to develop the local assignment of auto volumes to study area roads. The transportation study area extends from Dundas Street to Lake Ontario and from Spadina Avenue to Woodbine Avenue. While the EMME model projected auto demands on all major roads in the study area, it is a planning tool that does not account for fine operational details (e.g., delay at traffic signals, interaction with streetcars, etc.) and can be unreliable when used to project demands within a specific corridor or on a specific segment. The PARAMICS model took the aggregate auto demand and travel patterns for the study area from EMME and generate a more robust estimate of future auto demands.

Travel times for the OD pairs were determined using a combination of travel times from the City-wide EMME transportation model (for portions of the OD pairs travel outside the study area) and use of the PARAMICS transportation model for travel within the study area. The OD pairs were selected as representative trips into the Downtown to show travel time differences among the alternatives. The OD pairs represent travel from zones in the City that have

particularly high usage of the Gardiner-Lake Shore Boulevard East corridor. The AM peak hour was chosen to be assessed as it provides the most consistent commuter travel patterns and the highest volume of users. It serves as the "worst-case" auto travel condition. Afternoon (PM) travel often varies for commuters depending on the day.

The models represent travel times for 2031 which assume the full build out of lands in the study area and future population and employment projections. In addition, it was also assumed that new transit projects and other road network changes would be in place in the Study Area, as was done in the 2014 modelling, including the following:

- Go Transit service improvements;
- Relief Line (transit);
- Queens Quay East (Bay to Parliament), with transit in its own ROW and re-configuration of Queens Quay;
- Queens Quay East Extension (Parliament to Cherry), with transit in its own ROW and re-configuration of Queens Quay;
- Cherry Street reconfiguration (King to Railway Tracks) and transit in its own ROW (as part of the WDL Plan);
- Cherry Street reconfiguration (Railway Tracks to Ship Channel/ Commissioners) and new alignment (as part of Lower Don Lands Master Plan);
- Port Lands transit lines (Cherry, Villiers/Commissioners/Don Roadway, Leslie, and Unwin) Transit in its own ROW to serve the Keating, Lower Don Lands, and Port Lands areas. Transit service on the new Cherry Street, Villiers Street/Commissioners, and Don Roadway;
- New Public Roads in the West Don Lands (Bayview, River, Front) as part of the West Don Lands Precinct Plan; Extension of Bayview, River and Front to the WDL area;
- Broadview Extension contemplated in the Central Waterfront Secondary Plan: The actual alignment would be subject to the ongoing Environmental Assessment Study;
- York-Bay-Yonge Ramps Interchange Reconfiguration EA, which includes Gardiner Expressway ramps reconfiguration;
- Queens Quay West Transit in its own ROW; Re-configuration of Queens Quay from Bay to Spadina;
- Re-configuration of Front Street (outside Union Station);
- John Street public realm improvements and some lane reconfiguration;

- Bremner/Fort York Boulevard (construction of Fort York Boulevard, between Bathurst and Spadina is underway); and
- Simcoe Street underpass (completed).

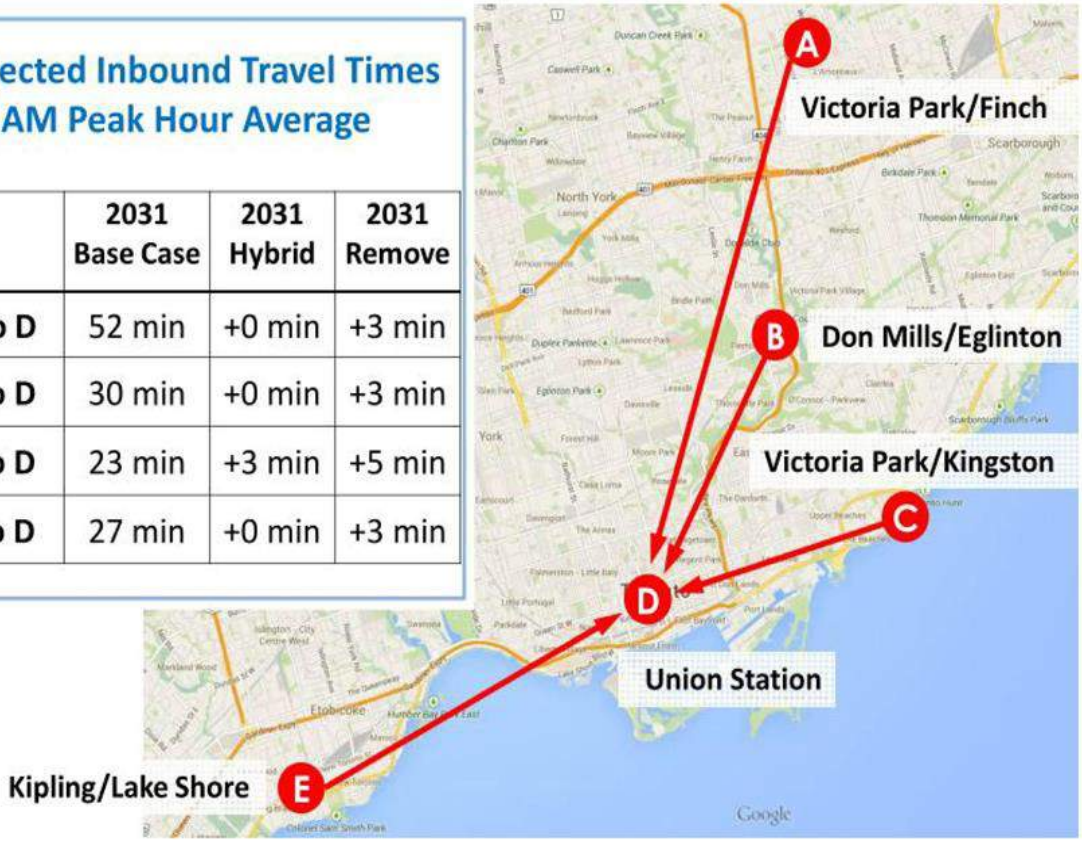
Prior to running the PARAMICS model, additional Travel Demand Management (TDM) measures were added to reflect anticipated changes in future travel behaviour as supported by trends and industry research (see Appendix D of the 2014 Alternatives Solution Evaluation Report). Both the Hybrid and optimized Remove (Boulevard) were assigned a 15% demand reduction. Note that the former Remove alternative was previously assigned a 25% demand reduction. As a result of the Remove (Boulevard) optimization efforts, the Remove (Boulevard) alternative can now process a higher volume of vehicles and reduced travel times.

The travel time modelling results are presented in **Figure 4.11** and indicate that for the select OD pairs, the optimized Remove (Boulevard) alternative reduces the additional travel time (over the future base case) to 3-5 minutes from the previously presented 5-10 minutes (AM peak hour). Despite these reductions, the Remove (Boulevard) still results in an additional travel time of 2-3 minutes over the Hybrid.

Figure 4.11: Auto Travel Times for Select OD Pairs for Hybrid and Optimized Remove

Projected Inbound Travel Times
AM Peak Hour Average

	2031 Base Case	2031 Hybrid	2031 Remove
A to D	52 min	+0 min	+3 min
B to D	30 min	+0 min	+3 min
C to D	23 min	+3 min	+5 min
E to D	27 min	+0 min	+3 min



Note: 2031 Base case travel times are approximately 5 minutes higher than current travel times due to expected growth in background (overall) traffic volumes.

It is noted that travel times were previously modelled as a sensitivity test for the original alternatives without the planned new transit projects noted above (expanded GO service was left in). The result of this "no new transit" sensitivity test indicates that Auto travel times for the selected OD pairs would increase by approximately an additional 2-3 minutes for these alternatives (over the travel times modelled for the original alternatives in 2031 with the planned transit projects in place). While not modelled, it is assumed that the Hybrid alternative would react similarly without new transit projects. This illustrates that new transit projects in addition to GO Transit improvements, while necessary to accommodate future travel demand, do not have a large impact on Auto Travel Times for the selected OD pairs.

Travel Times were also examined for travel in the AM peak hour (both directions) within the Transportation Study Area (Downtown). While the rankings of the alternatives for this criterion generally mimic those for the OD pairs (City-wide), this analysis provides information on the volume of automobiles affected. As presented in Table 3, for the Hybrid, 90% of the trips in the AM peak hour will have delays of less than 2 minutes while for the Optimized Remove

(Boulevard), 75% of the trips will have delays of less than 2 minutes. Related to this, the total vehicle hours in the AM peak for all trips in the Transportation Study Area were modelled. As shown in **Table 4.10**, Vehicle Hours Travelled (VHT) values are provided for:

- Total hours travelled in the peak hour for each alternative;
- Additional hours travelled for trips that have less than 2 minute increases over the Maintain; and
- Additional hours travelled for trips that have greater than 2 minute increase over the Maintain.

Table 4.10: Auto Travel Times for Select OD Pairs

Alternative	Total VHT	Additional Total hrs.	Additional hrs. for Trips <2min	Additional hrs. for Trips >2min
Maintain	5,649	--	--	--
Hybrid	6,272	624	367	256
Remove	7,289	1,640	694	947

The Remove (Boulevard) results in 1016 more total hours traveled in the AM peak hour than the Hybrid. To put this in context, there are 70,500 vehicle trips in the peak hour in the transportation system. As such, the Remove (Boulevard) results in an average approximate increase of approximately 52 seconds per vehicle trip over the Hybrid in the AM peak hour. It also needs to be highlighted that the presented increases in time are for auto trips only and if we were to distribute the increase across all modes of commuter travel then the impact of the travel time increase would be perceived as less significant.

A breakdown of additional travel hours in categories of <2 minutes and >2 minutes are provided as there is rationale to suggest that that trip length increases per commuter of less than 2 minutes are of less importance than trips length increases that are greater than 2 minutes because:

- Additional trip lengths that are < 2 minutes are within the average variability of the model outputs (on non-incident days); and
- Research on the value of time suggests small increments of time savings are less valuable as it is not possible for people to reschedule their activities to make use of the extra time in a meaningful way.

As such, if only additional trip lengths that are >2 minutes are considered, the travel time increase per trip would decrease to about 36 seconds.

Considering the rankings for the three criteria in this criteria group, the Hybrid alternative was identified as preferred due to its 2-3 minute lower travel times in the AM peak hour for the selected OD pairs over the optimized Remove (Boulevard). The Hybrid also results in lower total vehicle hours than the optimized Remove (Boulevard) for all vehicle trips in the transportation study area.

Movement of Goods

Modelled vehicle travel times for the representative OD pairs indicate that the Remove (Boulevard) results in additional travel times of 2-3 minutes over the Hybrid alternative. Further, other major City roads in the Downtown area may have higher traffic volumes due to traffic diversion under the Remove (Boulevard) during peak period travel hours. It can be expected that the movement of goods would experience similar additional travel times.

To assess reliability of the alternatives, a traffic incident/accident scenario was modelled for both alternatives. The reliability measure is concerned with the resilience of the alternatives to accommodate traffic incidences (e.g., accidents, road maintenance). Some of the goods movement stakeholders expressed opinion that a system with two roadways (Gardiner and Lake Shore Boulevard) should be more resilient as it provides more roadway options versus a system that includes just one roadway (Lake Shore Boulevard) through the corridor. The modelling work included the simulated closure of one westbound lane east of Jarvis Street for one-half hour in the peak hour.

Considering the change in average vehicle speed in the corridor, for the Remove (Boulevard), a westbound lane closure on Lake Shore Boulevard during the AM peak hour results in a 2 km/hr average speed reduction. In comparison, the Hybrid resulted in a 0.5 km/hr speed reduction for an incident on Lake Shore Boulevard and a 4.5 km/hr speed reduction for an incident on the Gardiner. Considering change in traffic volume during an incident, for the Remove (Boulevard), there was a reduced volume of 1,685 vehicles on Lake Shore Boulevard. In comparison, for the Hybrid, there was a reduction of 368 vehicles from an incident on Lake Shore Boulevard and a reduction of 2,211 vehicles from an incident on the Gardiner. Based on these results, it was determined that there is not a significant difference between the alternatives for this measure. It is noted that these modelled results are collaborated from observations by the City's Traffic Operations Monitoring group, which noted that incidences in the corridor are more impactful to traffic flow if on the Gardiner than on Lake Shore Boulevard. It was also noted that there is a higher frequency of incidents west of Yonge Street than in the Gardiner East study area.

Many stakeholders within the Study Area are involved in industrial and manufacturing operations. Examples of major goods produced include sugar, cement, concrete, cooling systems, roofing, and other manufacturing goods. While supply chains of these stakeholders may not be as sensitive to changes in average travel time and reliability as some others consulted, based on the stakeholder consultations, above 90% of all their goods movement traffic could be impacted by the removal of the Gardiner East (i.e., the trip would take longer and/or increase shipping costs). Their businesses currently rely significantly on the Gardiner Expressway/Lake Shore Boulevard corridor and for this reason may be particularly sensitive to proposed changes that may impact travel times or reliability.

For other stakeholders in retail and courier sectors, while reliance on the Gardiner Expressway for movements in Toronto may still be quite significant, a lower proportion of their total trips would be impacted by Gardiner East removal since these stakeholders operate in more diverse locations as opposed to an industrial stakeholders with a factory located in the Study Area. While the proportion of trips impacted for these stakeholders may be lower, these stakeholders may be more sensitive to changes in reliability and average travel times due to the nature of their supply chains and their businesses. For example, a courier company may need to allocate additional resources (additional delivery vehicles and additional labour) to carry out the same number of deliveries on routes that utilize the Gardiner-Lake Shore Boulevard corridor or impacted alternate routes with the same level of reliability and delivery times compared to the elevated expressway remaining (e.g., Hybrid). What this can mean is that for some stakeholders, reduced corridor capacity may equate to an increase in goods movement vehicles on the road for the same number of trips in order to maintain service standards.

Constructability Criteria Group

Stakeholders have expressed concerns regarding the construction staging of the alternatives, thus an example description of how the construction staging of each alternative could be phased is provided here.

Remove (Boulevard) Construction Staging

- **Stage 1-Pre-works (1 year)**
    - Prepare/extend detour roads including Queens Quay, Commissioners Street and Don Roadway, Cherry Street etc. Coordinate with planned development in this area
    - Complete detour road connections to Lake Shore Boulevard (east of Don River)
    - Construct new Lake Shore Boulevard alignment through Keating

- Install temporary Gardiner bents to support demolition activities

- **Stage 2 – Westbound Gardiner/Lake Shore Boulevard Works (2 years)**
  - Detour westbound traffic and demolish DVP off-ramp and westbound Gardiner Lanes
  - Construct new westbound boulevard lanes, intersections and DVP off-ramp
  - reroute traffic to new westbound lanes
- **Stage 3 – Eastbound Gardiner/Lake Shore Boulevard Works (2 years)**
  - Detour eastbound traffic and demolish DVP on-ramp and eastbound Gardiner lanes
  - Construct new eastbound boulevard lanes, intersections and DVP off-ramp
  - reroute traffic to new eastbound lanes
- **Stage 4 – Final configuration (1 year)**
  - Complete boulevard including public realm features
  - Remove detour roads

Hybrid Construction Staging

- **Stage 1 – Keating Works (2.5 years)**
  - Build new westbound on-ramp and Lake Shore Boulevard realignment through Keating Channel Precinct
  - Redirect traffic to new Lake Shore Boulevard alignment
  - Build new eastbound off-ramp and approach roads
- **Stage 2 – Logan Ramp Demolition/Boulevard Construction (2 years)**
  - Prepare/extend temporary detour roads including Don Roadway, Commissioners Street and Cherry Street
  - Detour Lake Shore Boulevard traffic east of Don River to temporary detour roads (traffic west of Cherry Street is unchanged)
  - Demolish Logan ramps and build new Lake Shore Boulevard

- **Stage 3 – Final configuration (1 year)**
  - Reroute traffic back to Lake Shore Boulevard
  - Complete boulevard including public realm features
  - Remove detour roads

Considering the above, while both alternatives are expected to involve a 6-year construction period, the Remove (Boulevard) alternative is expected to result in greater construction impacts and delays to traffic with 3-4 years of roads detours as compared to the Hybrid alternative which will require 1 to 1.5 years of road detours.

Urban Design Lens

The Urban Design lens considers three criteria groups: Planning, Public Realm and Built Form.

In regards to the Planning criteria group, the Hybrid is less preferred when considering consistency with Precinct Plans, as it would result in impacts to the Keating Channel Precinct as the new Gardiner on/off ramps would result in the loss of public space and limit pedestrian access between the Keating Channel and the realigned Lake Shore Boulevard. Both alternatives support the recommendations in the Don Mouth Naturalization Project EA and provide opportunity for the extension of Broadview Ave/LRT which is being studied in the Port Lands and South of Eastern TSMP EA.

Considering the Public Realm criteria group, both alternatives provide equal benefit east of the Don River. Within the Keating Channel Precinct, the Hybrid is less preferred due to the loss of public lands from the ramps/approach roads. West of Cherry Street, the Remove is clearly preferred as it provides new public realm space while with the Hybrid, current conditions essentially remain.

Finally, with respect to Built Form, again both alternatives facilitate redevelopment plans east of the Don River. The key differences lie west of Cherry Street, where the Remove (Boulevard) will allow building fronts to have active uses at-grade oriented towards Lake Shore Boulevard. Under the Hybrid, the majority of space along Lake Shore Boulevard west of Cherry Street will be back-facing and will not provide active uses at-grade.

Considering the above, the Remove (Boulevard) is preferred over the Hybrid for the Urban Design lens.

Environment Lens

The Environment Lens is concerned with noise and air effects and the potential for natural habitat enhancement within the corridor. Recognizing the baseline conditions of the corridor,

first many of the noise/air receptor locations represent future residential development locations as lands along much of the corridor are either vacant or are to be redeveloped. Regarding the natural environment, the corridor is highly degraded due to historical development and land use activities; the only natural feature of note in the corridor is the mouth of the Don River/ Keating Channel which is proposed to be realigned and re-naturalized.

Regarding potential noise effects, based on previous modelling results (see 2014 Alternatives Evaluation Report) the Remove (Boulevard) is expected to have slightly lower noise levels in the Gardiner-Lake Shore Boulevard corridor as a result of lower volumes of traffic (and slower speeds) in the corridor but there is potential for minor increased noise levels on other City streets due to expected traffic diversion to these streets. The previous model results showed that the relative change in noise levels is greater in the Gardiner-Lake Shore Boulevard corridor than on other City streets. It also needs to be recognized that most of the receptors potentially affected in the corridor are future receptors. As such, the difference between the alternatives with respect to noise is considered to be minimal.

Considering local air emissions in the Gardiner-Lake Shore Boulevard corridor, based on previous modelling results, it is anticipated that the Remove (Boulevard) would have slightly lower levels than the Hybrid due to lower vehicle volumes in the corridor. As noted above, many of the receptors in the corridor will be future receptors pending the completion of development plans in the area. The difference between the alternatives with respect to regional scale air emissions is considered to be of more relevance in comparing the alternatives given the ability of auto users to freely choose what routes they take to their Downtown destinations. Regarding regional air shed emissions, based on the completed modelling results, there is a minor difference between the alternatives. The alternatives are therefore considered to be similar. Thus, from a community health point of view, the alternatives are considered similar.

However, regarding regional greenhouse gas emissions, based on the model results, the Remove (Boulevard) has 12% less emissions which is reflective of the lower vehicle kilometers travelled in the transportation system for the Remove (Boulevard).

Opportunities for tree plantings and other habitat enhancements are similar for both alternatives east of the Don River but, to the west, Remove (Boulevard) results in better sunlight conditions that offer significantly greater “greening’ opportunities. Considering aquatic habitat, with the removal of all road infrastructure along the north side of the Keating Channel, the Remove (Boulevard) is expected to provide greater opportunity for the enhancement of aquatic habitat in the channel. Neither alternative result in significantly different impacts on built heritage and cultural landscape features or the activities of First Nations People. However,

Remove (Boulevard), which involves the expansion and realignment of Lake Shore Boulevard, results in a greater disturbance of known archaeological features.

Considering the above, for the Environment Lens, there is modest preference for the Remove (Boulevard).

Economics Lens

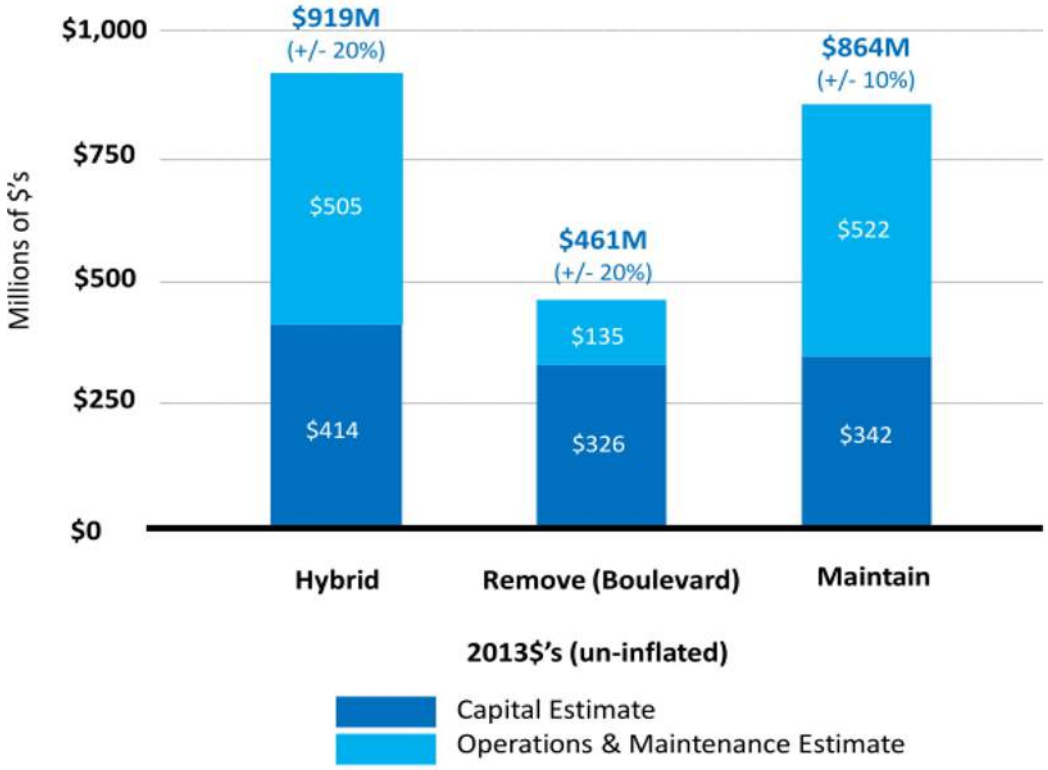
For this lens, the following describes the differences between the alternatives for the Direct Costs and Benefits criteria group. Differences between the alternatives for the other criteria groups within the Economics lens were previously discussed in Section 4.3.2.

Three criteria were considered under this criteria group: Capital Cost and Funding, Lifecycle Cost and Land Value Creation. Other than costs referencing the City's approved Capital Budget and Plan for the Maintain base case, costs for the Remove (Boulevard) and Hybrid alternatives outlined in this report represent high order-of-magnitude costs for comparative purposes only. These costs were based on conceptual designs only and may have a significant margin of error. Current cost estimates have not taken into consideration conflicts and constraints with respect to environmental and utility issues. More refined cost estimates will be derived from the next stage of EA work in which the preferred EA alternative solution is designed in greater detail. Costs for the Maintain option only have been advanced to the 30% design stage and reflect a conventional construction approach.

In regards to Capital Cost and Funding, **Figure 4.12** and **Figure 4.13** present the estimated capital costs for the alternatives. The estimated costs that were developed are high-level estimates that were developed on the bases of the concept plans for each alternative. These costs are intended for comparative purposes. The Remove (Boulevard) alternative has the lowest estimated lifecycle capital cost at $326 M (2013$) ($221 NPV) while the Hybrid has a cost of $414 M (2013$) ($260 NPV). Also considered under this criterion was the measure Property Acquisition. None of the alternatives are expected to require significant private property. There is potential for minimal private property acquisition along the Don Roadway (to the east of the right-of-way) for the Remove (Boulevard) alternative to accommodate new ramps that are required to connect the Don Valley Parkway with the new at-grade boulevard. The Funding Availability measure was provided as information but was not considered as an appropriate measure to rank the alternatives.

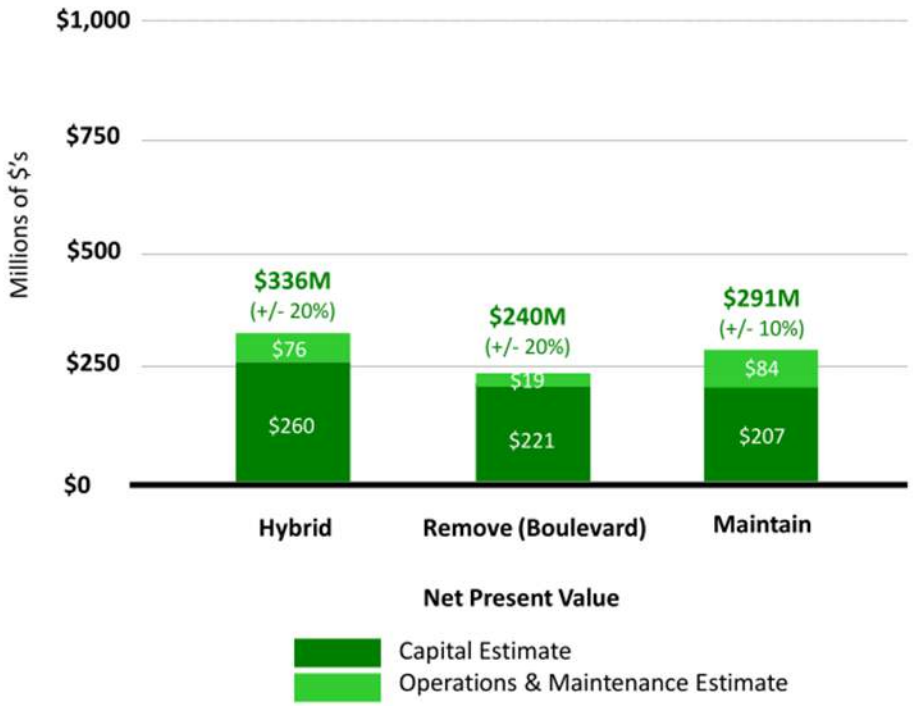
Lifecycle Costs as a net present value (NPV) were determined and include the total capital cost and the 100-year operations and maintenance costs for each alternative. The Remove (Boulevard) alternative was ranked preferred with the lowest NPV lifecycle cost ($240 M). The 100-year NPV lifecycle cost for the Hybrid is $336 M. **Figures 4.12 & 4.13** provide a breakdown of the 100-year lifecycle costs in 2013$ and NPV.

Figure 4.12: Alternatives Lifecycle Cost 2013$



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

Figure 4.13: Alternatives Lifecycle Cost Net Present Value (NPV)



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

Land Value Creation and Net Cost

An analysis of potential revenues from the sale of City land under the two alternatives was undertaken by HR&A Advisors. Development opportunities on publicly owned land in two distinct areas were examined: west of Cherry Street, and the area between Cherry Street and the Don River. Also described are development opportunities along Lake Shore Boulevard on publicly owned land east of the Don River.

Remove (Boulevard) would create 4.6 acres of redevelopment land west of Cherry Street, north of the realigned Lake Shore Boulevard between Yonge Street and Bonnycastle Street. This land is currently occupied by Gardiner-Lake Shore infrastructure and there would be no change under Hybrid. Between Cherry Street and the Don River, Remove (Boulevard) would create 12.9 acres of redevelopment land while Hybrid would create only 5.5 acres. The difference is because of the additional on/off ramps and connecting road infrastructure for Hybrid, as well as the existing elevated Gardiner East deck that would remain.

In sum, between Yonge Street and the Don River, Remove (Boulevard) would create an additional 12 acres of redevelopment land. Potential revenues from the sale of these City-owned lands have been valued at approximately $137 M in 2013 dollars – the equivalent of approximately $100 M in net present value.

The public land value benefit on the east side of the Don River is expected to well exceed $100 M (2013$). The full benefit is pending final development plans within the area. HR&A estimates that the 14 acre TPLC development block to the south-east of Lake Shore Boulevard and Don Roadway could generate land sale revenues of $64 M (2013). Also, there are additional City and TPLC lands further east in the Port Lands and South of Eastern area that cannot be valued until zoning is finalized through the various land use planning exercises that are currently underway. According to First Gulf, 20 acres of City and TPLC owned land could generate $100 M (2014$) in land sales. Both alternatives support the marketability of those lands because both alternatives feature a landscaped boulevard east of the Don River that will improve the accessibility and visibility of those lands.

If we consider the public land value creation benefits as a result of each alternative (between Jarvis and Don River there are 31 acres available from the Remove (Boulevard) and 19 acres available from the Hybrid), the net costs of the Remove (Boulevard) are $285 million (2013$)/$112 million (NPV) and the net costs for Hybrid are $880 million (2013$)/$337 million (NPV). If the potential land value east of the Don River is also considered, as discussed above, then these net costs would be equally further reduced.

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

4.5 Preferred Alternative Solution

Table 4.11 presents a summary of the alternatives rankings by the four study lenses. As presented in this table, the Hybrid alternative is preferred on the basis of the Transportation and Infrastructure lens while the Remove (Boulevard) is preferred on the basis of the Urban Design, Economics and the Environment lenses.

Considering the evaluation results presented in the previous chapter, both alternatives facilitate:

- Revitalization of the Don River Mouth and Flood Protection project;
- Development of the First Gulf site; and
- Implementation of new public transit projects.

However, there are differences in the benefits between the two alternatives, including:

- **Remove (Boulevard)** has a lower cost, higher revenue to the City from public land redevelopment, creates a lively Lake Shore Boulevard, facilitates better connections to the waterfront and is to result in less greenhouse gas emissions.

- **Hybrid** maintains an expressway connection function and level of service between the Gardiner and Don Valley Parkway, has lower auto travel and goods movement times, and less construction disruption.

Considering the benefit trade-offs of these two alternatives, the decision as to which of these two alternatives should be recommended as preferred was found to be difficult. Selecting the alternative based only on the number of evaluation lens/criteria groups preferences was not appropriate as this approach would not consider the variation in the magnitude of the effect/benefit, the period of the effect/benefit, the scale of users affected, the certainty of the forecast, and measures available to mitigate the effect. Further, a decision made on this basis would not consider how stakeholders and decision makers might weigh the relative importance of the criteria.

Opinions on the alternatives were highly divisive with some comments stating that the Gardiner infrastructure is integral to the City's transportation system while others noting that the east Gardiner is antiquated infrastructure that largely only serves as a DVP ramp to the downtown core and beyond and presents a barrier between the city and the waterfront.

Table 4.11: Summary of Remove (Boulevard) and Hybrid Evaluation Matrix

Study Lens	Criteria Group	Alternative 1: Optimized Remove (Boulevard)	Alternative 2: Hybrid	Summary
A. Transportation and Infrastructure	A.1 Automobiles	Less Preferred - As average AM peak hour auto travel times for select OD pairs are slightly longer – typically by about 2-3 min on average. More auto travellers in study area to experience a greater than 2 min increase in travel time (25%).	Preferred – As average AM peak hour auto travel times for select OD pairs are slightly shorter – typically by about 2-3 min on average. Less volume of auto travellers to experience a greater than 2 min increase in travel times (10%).	Hybrid is preferred for the Transportation and Infrastructure Evaluation Lens due to the lower auto travel time.
	A.2 Transit	Equally Preferred: Both alternatives to result in similar travel times on east-west routes serving transit in the Central Area, such as Dundas, Queen, and King Street Streetcars. Both alternatives facilitate new transit projects.	Equally Preferred: Both alternatives to result in similar travel times on east-west routes serving transit in the Central Area, such as Dundas, Queen, and King Street Streetcars. Both alternatives facilitate new transit projects.	
	A.3 Pedestrians	Preferred: Shorter crossing distances on Lake Shore Blvd. and more City standard sidewalk configurations	Less Preferred: Less normalized intersections and longer crossing distances on Lake Shore Blvd.	
	A.4 Cycling	Equally Preferred - 4200 metre cycling facility between Yonge and Leslie Streets	Equally Preferred - 4200 metre cycling facility between Yonge and Leslie Streets	
	A.5 Movement of Goods	Less Preferred – Less road capacity/higher travel times may have an impact on the movement of goods through the area.	Preferred – Due to greater road capacity and reduced vehicle travel times	
	A.6 Safety	Preferred - due to elimination of free flow right turns and sight line issues resulting from Gardiner columns.	Less Preferred - due to sight light issues resulting from Gardiner columns.	
	A.7Construction Impacts	Less Preferred – Similar overall construction period (6 years), but with more complex traffic management requirements and greater period of traffic detours required (3-4 years) and greater potential for traffic delays.	Preferred - Similar overall construction period (6 years), but less period of traffic detours required (1.5 years).	
B. Urban Design	B.1 Planning	Preferred - Accommodates development proposals east of the Don River and opens up the mouth of the Don River with removal of Logan Ramps. More flexibility to accommodate additional growth. Accommodates precinct plans in study area.	Less Preferred - Accommodates development proposals east of the Don River and opens up the mouth of the Don River with removal of Logan Ramps. Less flexibility to accommodate additional growth. Results in negative impact to Keating Precinct Plan.	The Remove is preferred for Urban Design. The take-down of the elevated FGE creates an opportunity for dramatic improvement in the urban design fabric of the corridor. This action transforms the corridor and allows the full development of a urban district introduced by a tree canopied urban boulevard.
	B.2 Public Realm	Preferred - Opportunity for significant streetscaping improvements. Significant increase in public realm area within corridor. Corridor will be open to sun and sky.	Less Preferred - Minor to moderate improvement in streetscaping – minor increase in public realm. Some opportunity for more trees.	
	B.3 Built Form	Preferred - Same benefits east of the Don River from removal of Logan Ramps. West of Cherry St., will allow building fronts to have active uses at-grade oriented towards Lake Shore Blvd.	Less preferred – Same benefits east of the Don River from removal of Logan Ramps. Majority of space along Lake Shore Blvd west of Cherry St. will consist of service uses and will not provide active uses at-grade.	
C. Environment	C.1 Social and Health	Preferred - Considering potential effects on community health, the alternatives are considered to be similar. However, due to 12% less Green House Gas emmissions, the Remove is considerd preferred (.	Less Preferred - Considering potential effects on community health, the alternatives are considered to be similar. However, due to 12% greater Green House Gas emmissions the Hybrid is less preferred.	
	C.2 Natural Environment	Preferred - Neither alternative will result in impact to existing natural features. Better facilitates ehancement of aquatic habitat in Keating Channel, less area of impervious surface (reduced stormwater generation), and improved micro-climate in corridor.	Less Preferred – Neither alternative will result in impact to existing natural features. Less opportunity for new/enhanced habitat and trees. Greater area of impervious surface.	The alternatives are similar with respect to community health effects. Remove is however, considered to be preferred due to lower green house gas emissions and greater opportunity to create new natural habitat.
	C.3 Cultural Resources	Less Preferred – Potential for greater impact on known archaeological features as a result of excavation.	Preferred – Less area of disturbances and less potential for impact on known archaeological features	
D. Economics	D.1 Global and Regional Economic	Less Preferred – Higher vehicle travel times could impact employers and employee decisions to locate/work downtown as compared to other regional employment centres.	Preferred – change to the regional attractiveness of the downtown is not expected to change.	
	D.2 Local Economics	Preferred – Both facilitate job growth opportunities east of the Don River. More new job opportunities west of the Don River (about 2,000 more).	Less Preferred – Both facilitate job growth opportunities east of the Don River. Less new jobs generated west of the Don River.	The Remove alternative is preferred from an economics perspective as it has lower net 100 year lifecycle cost.
	D.3 Direct Cost & Benefits	Preferred - Less $595 M (2013$)/$195 M (NPV) net revenue lifecycle cost.	Less Preferred – Additional $595 M (2013$)/$195 M (NPV) net revenue lifecycle cost.	

This decision required a trade-off between two very important (and related) City priority issues: traffic congestion and City building/prosperity (understanding that traffic congestion is a product of City growth and prosperity). There was not a strong technical case to select one alternative over the other. With or without the Gardiner, the waterfront/downtown core will grow just as it has in the recent past, and traffic congestion in the City will increase – even with new transit projects being developed. Both alternatives are technically viable although offer different advantages and disadvantages. Rationalizing a defensible preference for either alternative on the basis of the available facts, effects forecasts and received stakeholder input proved to be extremely difficult. To make the decision, the values, goals and priorities of those who represent the affected public needed to be taken into account. As such it was recommended in the Dillon Consulting May 2015 Alternative Solutions Interim Evaluation Report – Addendum and the May 6 2015 Toronto City Staff Report to Public Works and Infrastructure Committee that the decision regarding the preferred alternative solution should rest with Toronto City Council who, as representatives of the citizens of Toronto, can consider the facts and apply their value judgements on the trade-offs between these two alternatives.

City Council reviewed and considered the technical evaluation results at their June 10-12, 2015 meeting. Primary issues discussed and debated during that meeting included: the merits of preserving a continuous elevated Gardiner-DVP freeway linkage versus removal of a portion of the elevated expressway and its replacement with an at-grade boulevard and new on/off ramps; an acceptable level of impact on road capacity and travel times (for both personal and commercial vehicles) in any future preferred design; capital and lifecycle cost comparisons among the Remove, Maintain and Hybrid options before Council at that time, and the various opportunity costs related thereto; compatibility of the various alternatives with the Gardiner East EA Terms of Reference, applicable City of Toronto Official Plan policies, and various waterfront revitalization initiatives; and potential for impact to the parks, open spaces and development opportunities identified within the Keating Channel Precinct Plan.

After significant Council debate on the trade-offs and advantages and disadvantages of the two alternatives, City Council endorsed the Hybrid as the preferred solution and further directed City staff to develop and evaluate alternative Hybrid designs that would mitigate the negative impacts associated with the Hybrid solution.

5.0 Design Alternatives

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

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

5.1 Alternative Designs Corridor Segments Overview

As shown in **Figure 5.1**, the study corridor was considered in three segments including:

1. West of Lower Jarvis Street to Cherry Street;

Cherry Street to the Don Roadway / Don Valley Parkway (DVP); and

Don Roadway / DVP to Leslie Street.

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

5.1.1 Segment 1 - Lower Jarvis Street to Cherry Street:

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

Figure 5.1: Study Segments of Gardiner-Lake Shore Boulevard Corridor (Hybrid 1)

5.1.2 Segment 2 - Cherry Street to the Don Roadway

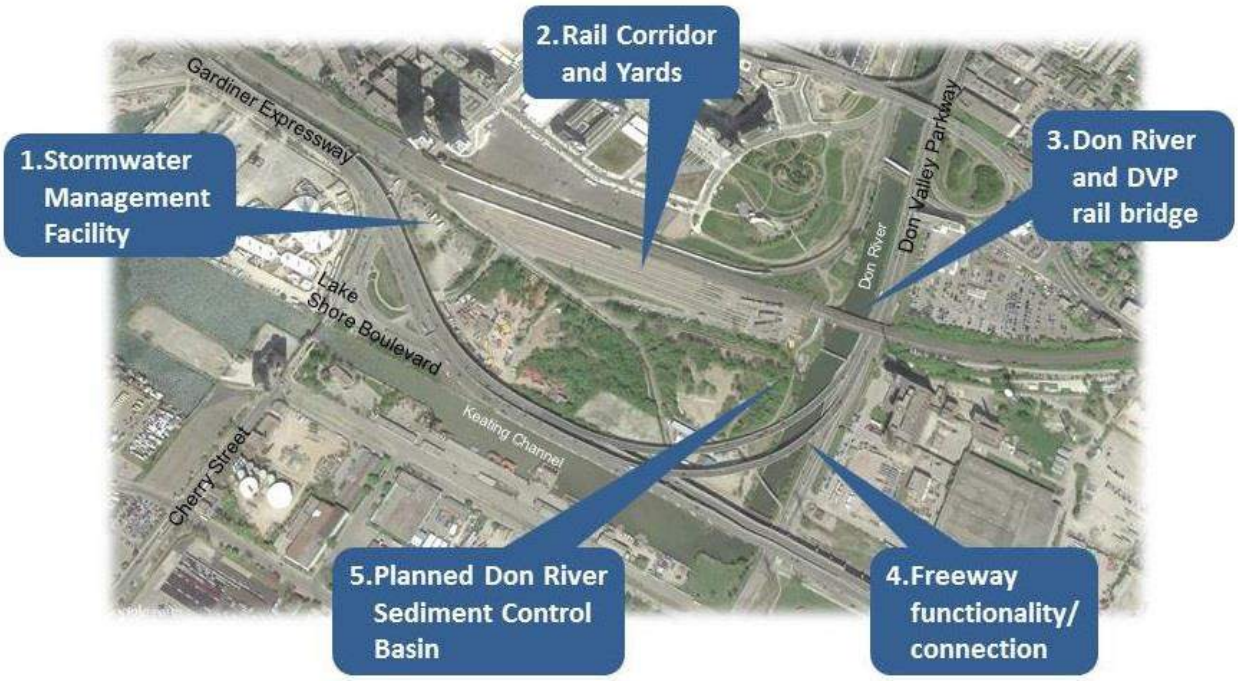
In this segment (through the Keating Channel Precinct) design alternatives have been developed and were considered in this EA. With the removal of the eastern end of the Gardiner, east of the Don Roadway (see Segment 3), the opportunity arises to rebuild the expressway connection between the Don Valley Parkway and the Gardiner. This also presents the opportunity to rethink the location and alignment of new ramps to connect Lake Shore Boulevard to and from the Gardiner, west of the Don Roadway. The opportunities for these changes occur within the Keating Channel Precinct between Cherry Street and the Don Roadway and three Hybrid design alternatives were developed and considered for this segment.

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

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

Figure 5.2 highlights the location of these key considerations influencing the design alternatives. The Hybrid design alternatives were prepared with these considerations in mind and are described in **Section 5.2** further below.

Figure 5.2: Key Infrastructure Considerations Influencing Design Alternatives



5.1.3 Segment 3 - Don Roadway / DVP to Leslie Street:

The Hybrid alternative solution that was endorsed by City Council in June 2015 included the removal of the Logan Ramps that are located over and east of the Don River. Specifically the changes that are proposed east of the Don Roadway include:

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

All the examined Hybrid alternatives include these changes east of the Don River. No EA alternative designs were identified for this segment. Lake Shore Boulevard is to remain within the existing road right-of-way and be rebuilt as a six-lane boulevard to accommodate forecasted auto travel demands and connect with Lake Shore Boulevard at Leslie Street and at the Don River crossing. As noted above the existing multi-use pathway is to be maintained and

improved to accommodate active transportation modes. While these public realm changes are not subject to EA approval, they are described further in this EA Report (see **Section 6.2**).

5.2 Alternative Hybrid Designs

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

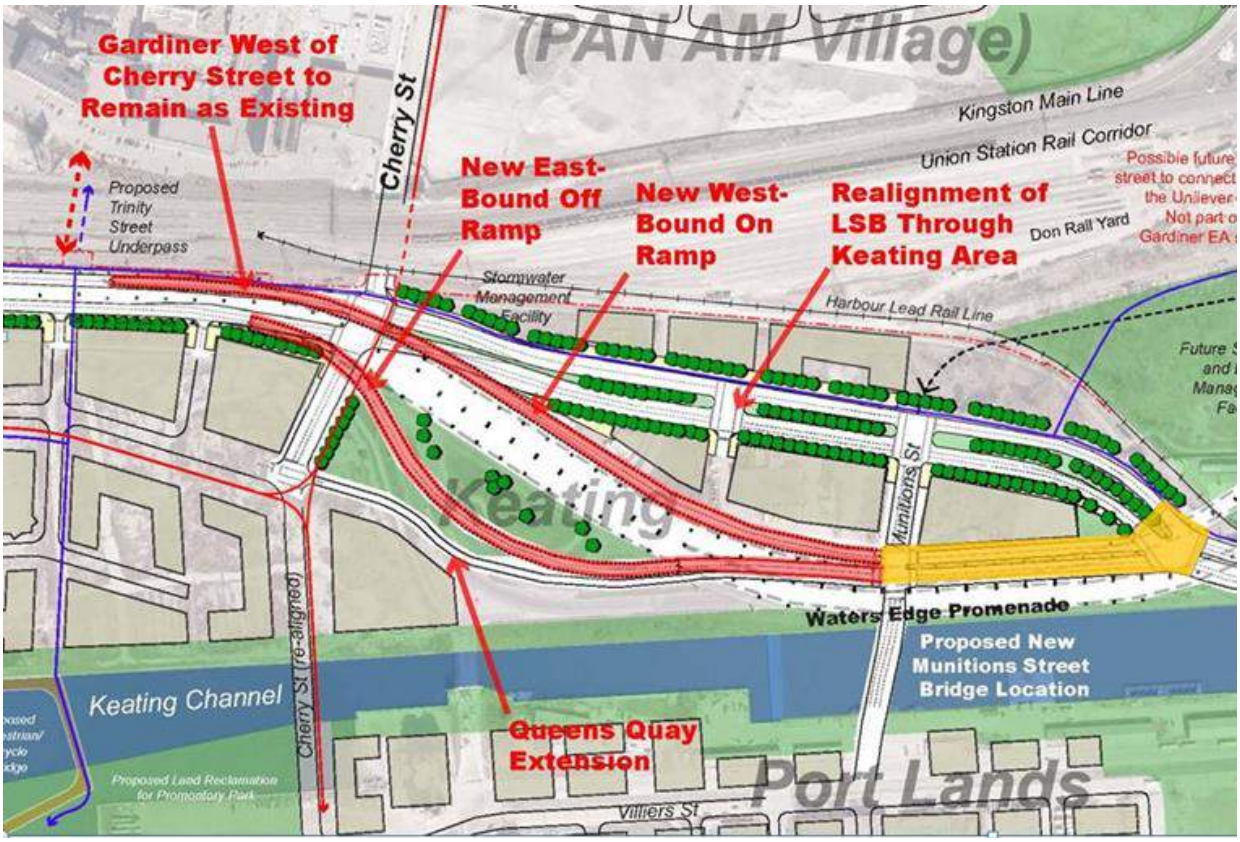
5.2.1 Hybrid Designs Not Carried Forward

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

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

Council Reviewed Hybrid

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

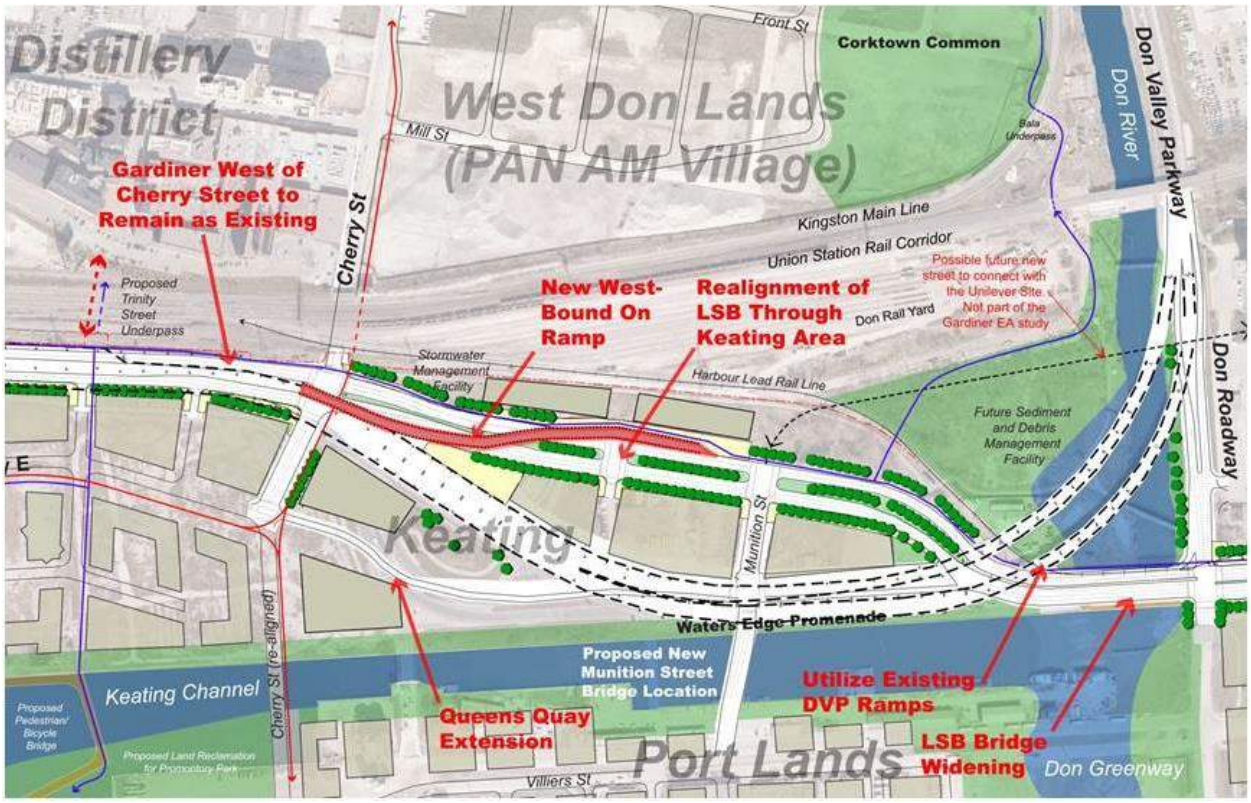


Council reviewed Hybrid – not carried forward.

Hybrid with Westbound On-Ramp Only

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

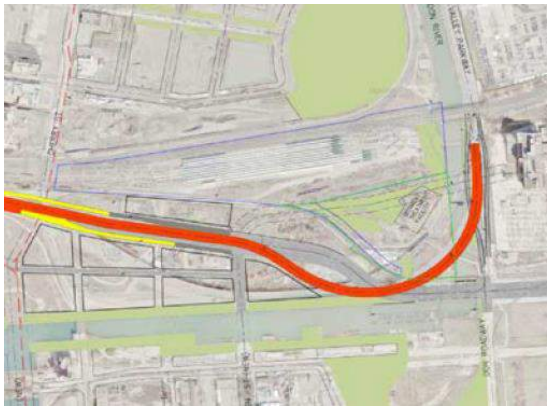
Keating Channel Precinct area would force vehicles headed east of the Don Roadway to stay on Lake Shore Boulevard or find alternate paths along other heavily trafficked east-west roadways. Based on the traffic modelling that was completed for the 2031 horizon year, PM peak hour auto travel time for eastbound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



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

Realigned Hybrid with 70km/h Design Speed

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



Hybrid ramp design with 70 km/hr design speed.

Hybrid over Stormwater Facility with 60km/h Design Speed

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

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

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

would complicate the design of the realigned Lake Shore Boulevard, including intersection locations, through the Keating Channel Precinct;

- Reducing the height of the SWM facility to approximately eight metres from the current 13 metres would result in the need to redesign and tender the building project; and
- Spanning of the expressway over the SWM facility could result in impacts and/or restrictions on maintenance activities for both the new expressway and the SWM facility.

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

Hybrid with a 15 metre Rail Flyover

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

Hybrid with 15 metre rail flyover.

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

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

15 metre rail flyover without on/off ramps

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

5.2.2 Hybrid Designs Considered

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

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

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

The key design elements of each of the three Hybrid alternatives (Hybrids 1, 2 and 3) are described below. **Figures 5.3** through **5.5** present the three Hybrid design alternatives in the Keating Channel Precinct, between Cherry Street and the Don Roadway / DVP. **Figure 5.6** presents a comparison of the three Hybrid alignments and **Figure 5.7** presents renderings of the Hybrids showing their alignments over the Don River with full build out of the Keating Channel Precinct. These renderings include potential public realm improvements for all of the alternatives.

Hybrid Design Alternative 1

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

Hybrid Design Alternative 2

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

Hybrid Design Alternative 3

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

Lake Shore Boulevard Alignments

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

Figure 5.3: Hybrid Design Alternative 1 (South) – Keating Channel Precinct

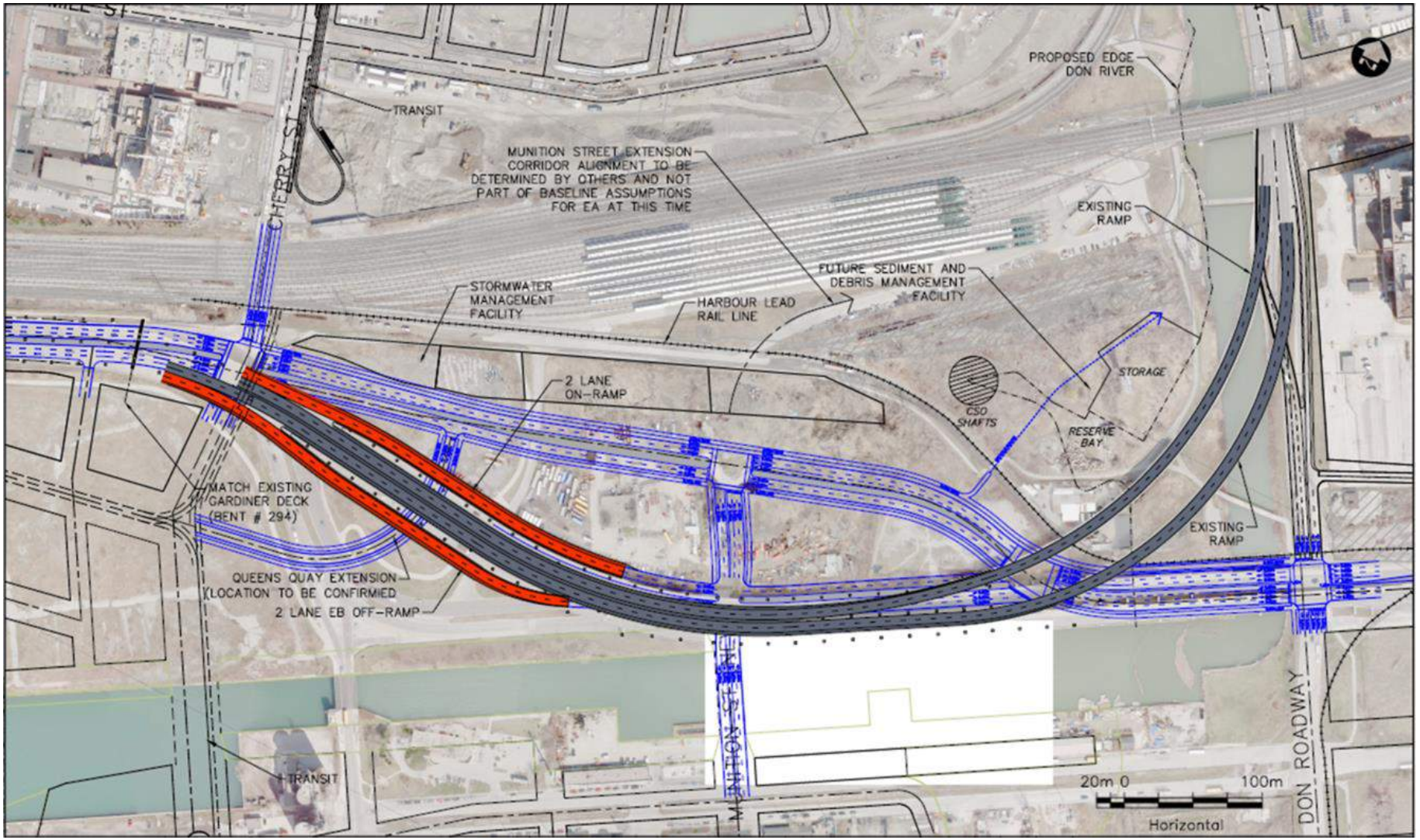


Figure 5.4: Hybrid Design Alternative 2 (Mid) – Keating Channel Precinct

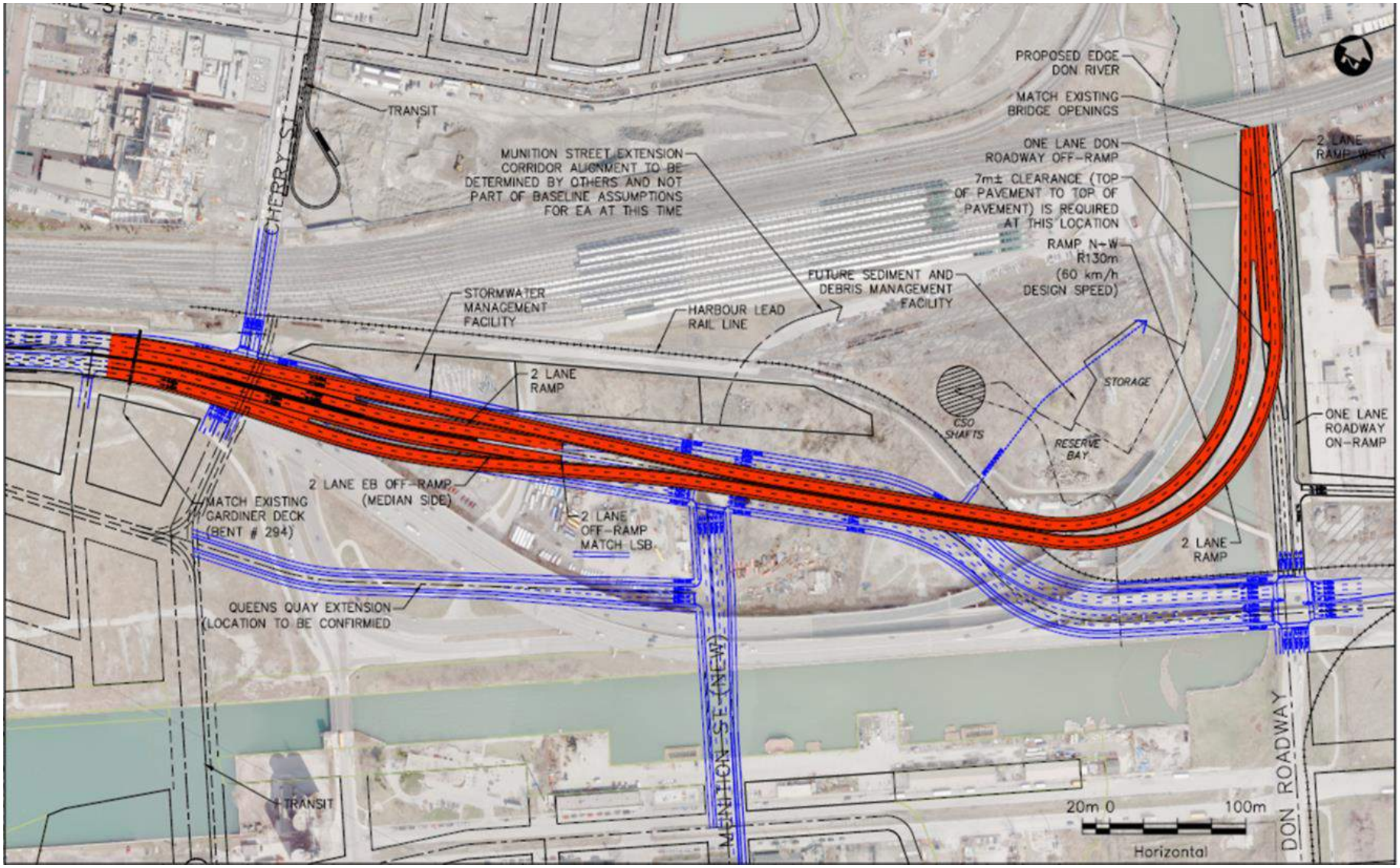


Figure 5.5: Hybrid Design Alternative 3 (North) – Keating Channel Precinct

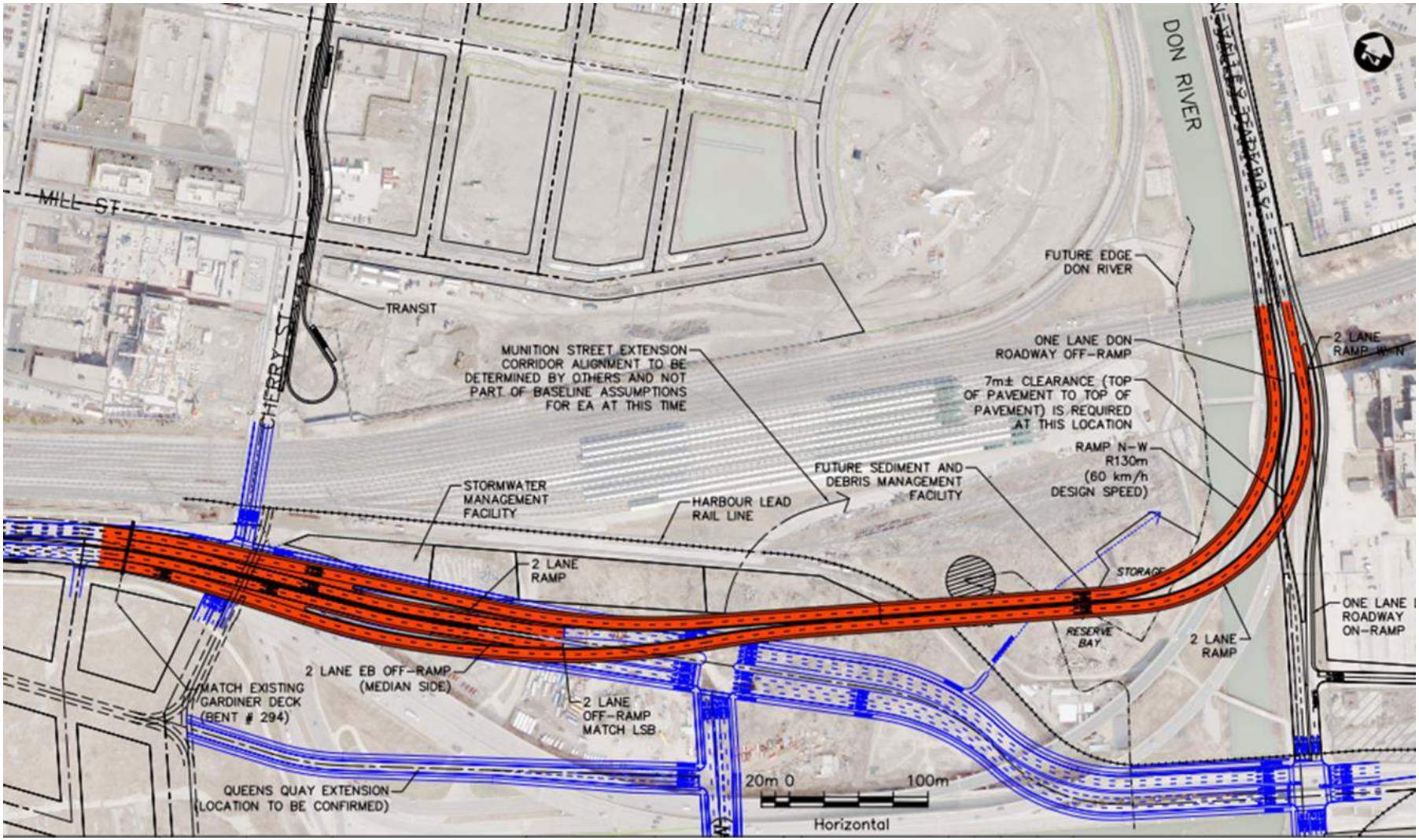


Figure 5.6: Hybrid Design Alternatives – Alignment Comparison

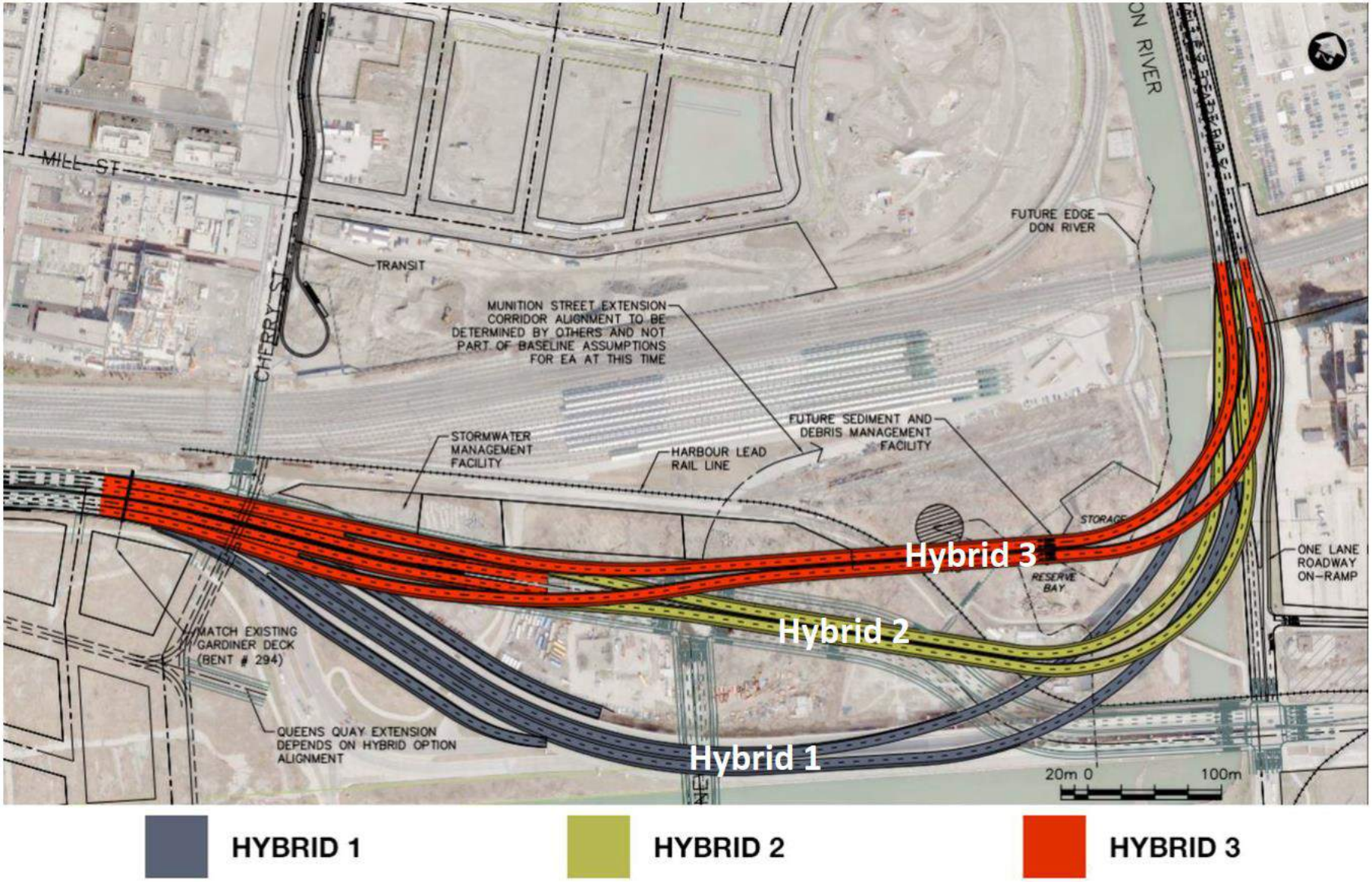


Figure 5.7: Hybrid Design Alternatives – Future Build-out Comparison

5.3 Hybrid Design Alternatives Evaluation Approach

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

5.3.1 Evaluation Criteria

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

Table 5.1: Hybrid Alternative Designs Evaluation Criteria Groups and Criteria

Study Lens/ Criteria Group	Criteria	Definition
TRANSPORTATION and INFRASTRUCTURE		
Automobiles	Commuter Travel Time (Average travel time for AM and PM peak hour) within Downtown / Transportation Study Area	Average in-bound peak hour travel time between representative Origin-Destination (O-D) pairs.
	Impact on Average Auto Travel Time (AM peak hour.) within Downtown/ Primary Transportation Study Area	Change in average peak hour travel times (all directions for local traffic trips within the area of Spadina Avenue and Woodbine Avenue and south of Dundas Street).
	Road Network Flexibility/ Choice	Ability to accommodate traffic demand, minimize turning prohibitions, accommodate future road infrastructure changes, and accommodate new/future development with new road access.
Transit	Transit Impact	Ability to accommodate new/future waterfront transit service.
Pedestrians	Pedestrian Access Through Keating Channel Precinct	Ability to implement an attractive and safe pedestrian environment that allows for east-west and north-south travel including connections at Cherry Street and into the Port Lands.
Cycling	East-West Movement	Ability to accommodate east-west cycling facilities and opportunities to connect with existing and planned north-south cycling facilities.
Movement of	Travel Time	Potential for changes in travel times for the movement of goods.

Study Lens/ Criteria Group	Criteria	Definition
Goods	Reliability	Ability to manage traffic incidents in the corridor.
	Transport and Shipper Cost	Transportation costs can be impacted by a number of factors including mode of transport choice, service standards required, regulations, etc. Increase in travel time costs to carriers and transporters (increased fuel consumption, driver time, need for more trucks on the road).
Safety	Pedestrian Conflict Points	Traffic exposure risk for pedestrians at intersections and crossing Lake Shore Boulevard considering width/distance of roadway to cross, intersection configuration and sight lines.
	Cyclist Conflict Points	Extent to which cyclists are exposed to free flowing/uncontrolled auto traffic flow. This includes free flowing access ramps to and from the Gardiner Expressway where automobile traffic has the right of way.
	Motorist Conflict Points for at-Grade Roadways	Extent to which there are road safety concerns for motorists. Includes poor sight lines, access ramps and intersection configuration.
	Safety Risk for Motorists on Gardiner Expressway	Extent of expressway road geometry that poses safety risk for drivers, particularly lack of shoulders.
Construction Impact	Duration and Extent of Construction Impact	Number of years required to complete construction, with an emphasis on the number of years that will result in traffic impacts. Potential for traffic infiltration onto side streets. Extent of pedestrian and cycling facilities to be affected during construction.

Study Lens/ Criteria Group	Criteria	Definition
	Private Property	Extent of private property to be used during construction and potential for access to private properties (e.g. driveways) to be impacted.
URBAN DESIGN		
Planning	Consistency with Official Plans	Extent to which the principles and recommendations of the City's Official Plan and the Central Waterfront Secondary Plan are accommodated and supported.
	Consistency with Precinct Plans and other Plans and Initiatives	Impact on planned improvements to the Cherry Street/Lake Shore Boulevard intersection and its ability to serve as a gateway to the Port Lands. Impact on development phasing of waterfront precincts. Extent to which the goals, objectives and recommendations of the East Bayfront and Keating Channel Precinct Plans are accommodated and supported as well the Don Mouth Naturalization Project EA and the Port Lands and South of Eastern TSMP EA Study.
Public Realm	Streetscape	Quality of place along Lake Shore Boulevard, Queens Quay extension and within the Keating Channel Precinct. Ability to create attractive and consistent streetscapes in Keating Channel Precinct.
	View Corridors	Ability to create high quality visual connections along roadways, among the Precincts, and to/from the water, including visual connections along waterfront and over the Don River.

Study Lens/ Criteria Group	Criteria	Definition
	Public Realm	Ability to create an attractive public realm in the Keating Channel Precinct including pedestrian areas, patios, passive recreation, multi-use trails and streetscaping. Ability to create an attractive pedestrian promenade with connection to the Keating Channel Precinct.
	New Open Space	Area and quality of open space in the Keating Channel Precinct that would be usable, complements the waterfront promenade and accommodates the cycling trail network.
Built Form	Street Frontage	Length of leasable, active, at-grade space along Lake Shore Boulevard and Queens Quay that would support high quality development including retail. Also considers the amount of above-grade development that would be negatively impacted by proximity to elevated expressway structures.
ENVIRONMENT		
Social & Health	Air Quality	Air quality conditions at the local and regional level, including changes in NOx, VOCs, PM2.5, as well as the level of greenhouse gas emissions.
	Noise	Noise level change at various receptors locations in the study area.
Natural Environment	Terrestrial Environment	Opportunity for new and/or enhanced land-based natural habitat, species and features.
	Aquatic Environment	Opportunity for new and/or enhanced aquatic-based habitat, species and features.

Study Lens/ Criteria Group	Criteria	Definition
	Storm Water Quality	Proximity of roadway infrastructure to the Keating Channel and potential to impact water quality and manage the conditions/quality of water run-off to receiving water bodies.
	Storm Water Quantity	Potential impact (including benefits) on Don River flood water conveyance and resilience to climate change effects.
	Microclimate/Heat Island Effect	Local atmospheric conditions and ability for the road network to support a tree canopy and other landscaping.
Cultural Resources	Built Heritage	Potential for impact on historic physical architecture and cultural property that is inherited and maintained within the corridor.
	Cultural Landscape	Potential for impact on the existence of a built or natural landscape that is valued by people for its religious, artistic or cultural associations within the corridor.
	Archaeology	Potential for impact on known buried resources or artefacts within the corridor.
	First Nations People and Activities	Potential for impact on the use of the study area by First Nations for traditional purposes.
ECONOMICS		
Global & Regional Economics	Toronto's Global Competitiveness	Influence on change in the global attractiveness of the City of Toronto.
	Regional Labour Force Access	Potential for change in level of access to/from the downtown core.
	Mobility within Downtown	Potential for change in worker mobility in the downtown core/CBD and disruption during construction.

Study Lens/ Criteria Group	Criteria	Definition
	Entertainment Venues	Potential for change in access to major entertainment venues in the downtown (e.g. ACC, Rogers Centre, etc.) and change in their ability to attract visitors.
Local Economics	Business Activity	Number of jobs created in the corridor and/or study area.
Direct Cost & Benefit	Capital Cost	Capital cost to construct the alternatives and identification of potential private property needs.
	Lifecycle Cost	Net present value of construction cost and 100-year operations and maintenance costs of the alternative.
	Public Land Value Creation	Amount of money that could be generated in Keating Channel Precinct and adjacent affected areas (e.g. Villiers Island) through the creation and sale of new land for the City.

5.3.2 Effects Assessment & Evaluation Approach

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

5.3.3 Consideration of Public Input

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

The public consultation event on January 19th saw over 300 participants and another 60 watched the live webcast of the presentation and participated online. More than 60 people also completed an online survey on the project website and many others weighed in via Twitter to provide their feedback on the evaluation of design alternatives and urban design concepts for the study area. In total, including website visits, almost 3,700 individuals participated in the evaluation of design alternatives consultation process between January 5 (when the public notice was issued) and January 29, 2016. The details of the consultation activities are documented in the Round Five Consultation Report, prepared by Lura Consultants, included as Appendix 4 to the City Staff Report (February 17, 2016) on the Gardiner East EA. The key questions asked at the consultation events were:

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

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

Hybrid Design Alternative 1 (South)

Participants who expressed support for Hybrid 1 noted:

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

Concerns with Hybrid 1 included:

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

Hybrid Design Alternative 2 (Mid-Precinct)

Participants who expressed support for Hybrid 2 noted:

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

Concerns with Hybrid 2 included:

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

Hybrid Design Alternative 3 (North)

Participants who expressed support for Hybrid 3 noted:

- It achieves the most goals outlined for the EA, particularly revitalizing the waterfront and reconnecting the City with the lake;
- It moves the expressway corridor closer to the railway and away from the Keating Channel, increasing opportunities for future development and public realm improvements along the waterfront and to the mouth of the Don River;
- Releases public land on the north side of the Keating Channel for other uses (e.g., development, public space, etc.);
- Improves public access to the waterfront, particularly in terms of north-south connectivity;

- Locating on/off ramps within the corridor consolidates the infrastructure away from other valuable space;
- Maintaining expressway capacity during most of the construction period is beneficial;
- Benefits from increasing open space and improving bike and pedestrian trails;
- The tighter curve that connects the elevated expressway with the Don Valley Parkway along the railway corridor, creates the most public realm benefits;
- Enables more two-sided public realm improvements along Lake Shore Boulevard corridor (i.e., landscaping) east of Munition Street;
- Maximizes opportunities to revitalize the Keating Channel Precinct; and,
- Improves the at-grade experience for pedestrians and cyclists.

Concerns with Hybrid 3 included:

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

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

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

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

- Move the alignment further north

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

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

5.4 Comparative Evaluation of Alternatives

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

5.4.1 Criteria Group Discussion

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

5.4.1.1 Transportation and Infrastructure Lens

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

- All three Hybrid design alternatives have similar auto travel time and capacity along the corridor;

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

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

5.4.1.2 Safety Criteria Group

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

For criteria 1 and 2, the assessment of the pedestrian and cycling safety focused on potential conflicts related to crossing Lake Shore Boulevard, presence of Gardiner access ramps, and sight lines for pedestrians and cyclists. For cyclist safety, the assessment found no difference among the design alternatives in conflict points through Keating Channel Precinct. All three design alternatives include a separated multi-use path for cyclists that would be unobstructed by the Gardiner. For pedestrian safety, design Alternative 1 (south) presents greater risks for pedestrians trying to access the waterfront and Keating Channel as they would need to cross the Gardiner ramp access roads. The access ramps to and from the Gardiner will minimize the locations where pedestrian access to the waterfront is possible. This may result in more pedestrian conflicts, whereas design Alternatives 2 (mid-precinct) and 3 (north) locate the

access ramps north of the water's edge and do not prevent pedestrian access to the water's edge.

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

- Hybrid Design Alternative 1 (south) (Reminder: This design alternative utilizes the existing ramps connecting the Gardiner-DVP):
    - The existing Gardiner-DVP Ramps do not meet current road engineering standards as the ramps do not have roadway shoulders and there are some constrained sight lines for motorists. There may be an opportunity to provide wider ramp shoulders when ramps are redecked in the future but the ability to accommodate this needs to be confirmed during detailed design;
    - Despite the road design not being up to modern standards, few traffic collisions occur;
    - There are potential sight line issues with the new eastbound off-ramp from the Gardiner to Lake Shore Boulevard. The presence of the expressway columns connecting the Gardiner to the DVP may impact sight lines for those coming down the eastbound off-ramp; and,
    - With the new westbound on-ramp, there are potential weaving issues between those motorists entering westbound on the Gardiner from Lake Shore Boulevard with the westbound motorists coming from the DVP ramps and attempting to access the Sherbourne exit.
- Hybrid Design Alternative 2 (mid-precinct) and Hybrid Design Alternative 3 have similar assessment results which include:
    - Rebuilding the Gardiner-DVP ramps allows the road design to include wider shoulders which will improve sight lines;

- The new Gardiner-DVP ramps are designed with a tighter radius and as such require a lower posted travel speed along the ramps. There is the potential for drivers to expect higher Gardiner-DVP ramp speeds than the posted design speed 90 km/hr speed limit to transition to a 50km/hr speed limit. Signage and speed deceleration zones are required to accommodate the lower design speed ramps;
- Ramps to and from the Gardiner and connecting the Gardiner-DVP can be designed to an acceptable level of safety with appropriate mitigation applied; and,
- The placement of the Keating Channel Precinct westbound on-ramp in the centre of the Gardiner footprint has less potential for traffic weaving conflict with DVP (southbound to westbound) traffic wanting to exit at Sherbourne Street.

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

5.4.1.3 Constructability Criteria Group

Constructability is of interest to stakeholders to understand the amount and length of traffic disruption that could occur during the building of the infrastructure. A construction staging report was completed by Morrison Hershfield and Dillon Consulting and is available in **Appendix D, Construction Staging Report**.

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

- Maintaining an appropriate number of travel lanes within the Gardiner-Lake Shore Boulevard corridor during construction to ensure adequate capacity for local and through traffic;
- Removal of existing bridge deck sections will not be carried out over live traffic or public areas;

- The need to utilize some sections of existing roads in the immediate area for detour traffic while bridge works are ongoing. In some cases this will involve the local widening of existing area roads, including construction of a temporary timber deck bridge across the Keating Channel (approximately 80 m east of Cherry Street) to facilitate a new east-west detour of traffic around the prime construction area;
- The requirement to stage the demolition of the existing Gardiner/DVP ramps (i.e. partial deck removals) to maintain adequate traffic capacity; and,
- The scheduling of weekend and night time works for bridge demolition to avoid potential safety concerns.

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

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

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

- Widen the existing Don Roadway in both the northbound and southbound directions and realign to fit the future final alignment;
- Construct a new six- lane eastbound/westbound detour from Don Roadway and Lake Shore Boulevard intersection, continue south to Villiers Street and/or Commissioners Street, across Villiers Street and/or Commissioners Street, and then back north of Keating Channel before finally connecting to the existing Lake Shore Boulevard east of Cherry Street. The work will include construction of a bridge crossing across Keating Channel which may be done using a temporary timber deck bridge;
- Widen the existing Jarvis Ramp and remark the pavement to carry two lanes with reduced speed (subject to Ramp changes as per Lower Yonge Precinct Plan/Class EA Study);
- Begin construction of the Gardiner-Cherry Street ramp bridges that are not in conflict with the existing structure or the existing Lake Shore Boulevard; and,
- Construct portions of the new Lake Shore Boulevard roadway that are not in conflict with the existing structure or the existing Lake Shore Boulevard.

Stage 1 – Westbound Demolition and Construction (1 year)

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

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

Stage 2 – Eastbound Demolition and Construction (1 year)

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

Stage 3 – Final Construction (1 year)

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

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

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

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

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

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

Stage 1 – Westbound Demolition and Construction (1 year)

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

Stage 2 – Eastbound Demolition and Construction (1 year)

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

Stage 3 – Final Demolition and Construction (1 year)

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

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

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

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

Stage 1 – Westbound Demolition and Construction (1 year)

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

Stage 2 – Eastbound Demolition and Construction (1 year)

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

Stage 3 – Final Demolition and Construction (1 year)

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

For all of the design alternatives, construction of the realigned Lake Shore Boulevard can largely be done while maintaining the operation of the current Lake Shore Boulevard. Considering the above, Hybrid Design Alternative 1 is expected to involve the shortest construction period at

4 years, and includes the shortest period of traffic detours and is therefore preferred. Hybrid Design Alternatives 2 and 3 are less preferred than Hybrid 1 as they involve 5 year construction periods with greater detour requirements and traffic delay to build the new Gardiner-DVP ramp connections. Hybrid Design Alternative 3 is considered to be preferred over Hybrid 2 as a greater portion of the ramps can be constructed without traffic disturbance and the widening of the Don River/DVP rail underpass could provide roadway detour opportunities and thus reduce delays to traffic during construction.

5.4.1.4 Urban Design Lens

The Urban Design lens considers three criteria groups: Planning, Public Realm and Built Form. The greatest influence on the urban design potential for the Keating Channel Precinct is the location of the ramps connecting the Gardiner to the DVP. **Figures 5.8, 5.9** and **5.10** provide the urban design plans for each of the three Hybrid design alternatives which were considered in the evaluation.

Planning

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

Public Realm

Hybrid Design Alternative 1 is less preferred for all Public Realm criteria including streetscape, view corridors, public realm and open space. This design alternative does not allow for the full extension of Queens Quay East, minimizes public access to the Keating Channel and disrupts view corridors to the waterfront. Hybrid Design Alternative 2 is moderately preferred, with the achievement of the Queens Quay East extension, an unencumbered water's edge along Keating Channel, and improved connections for Munition Street. Hybrid Design Alternative 3 further improves on Alternative 2 and is preferred for Public Realm. In addition to achieving the improvements noted for Alternative 2, it provides the greatest opportunities for landscape and visual connections along Lake Shore Boulevard and the Don River. **Figures 5.11, 5.12** and **5.13** illustrate the potential for the Keating Channel Water's Edge Promenade for each Hybrid design alternative. Also, **Section 6.2** provides a description of the public realm improvements that are proposed for the entire Gardiner East corridor.

Figure 5.8: Hybrid Design Alternative 1 (South) – Urban Design Plan

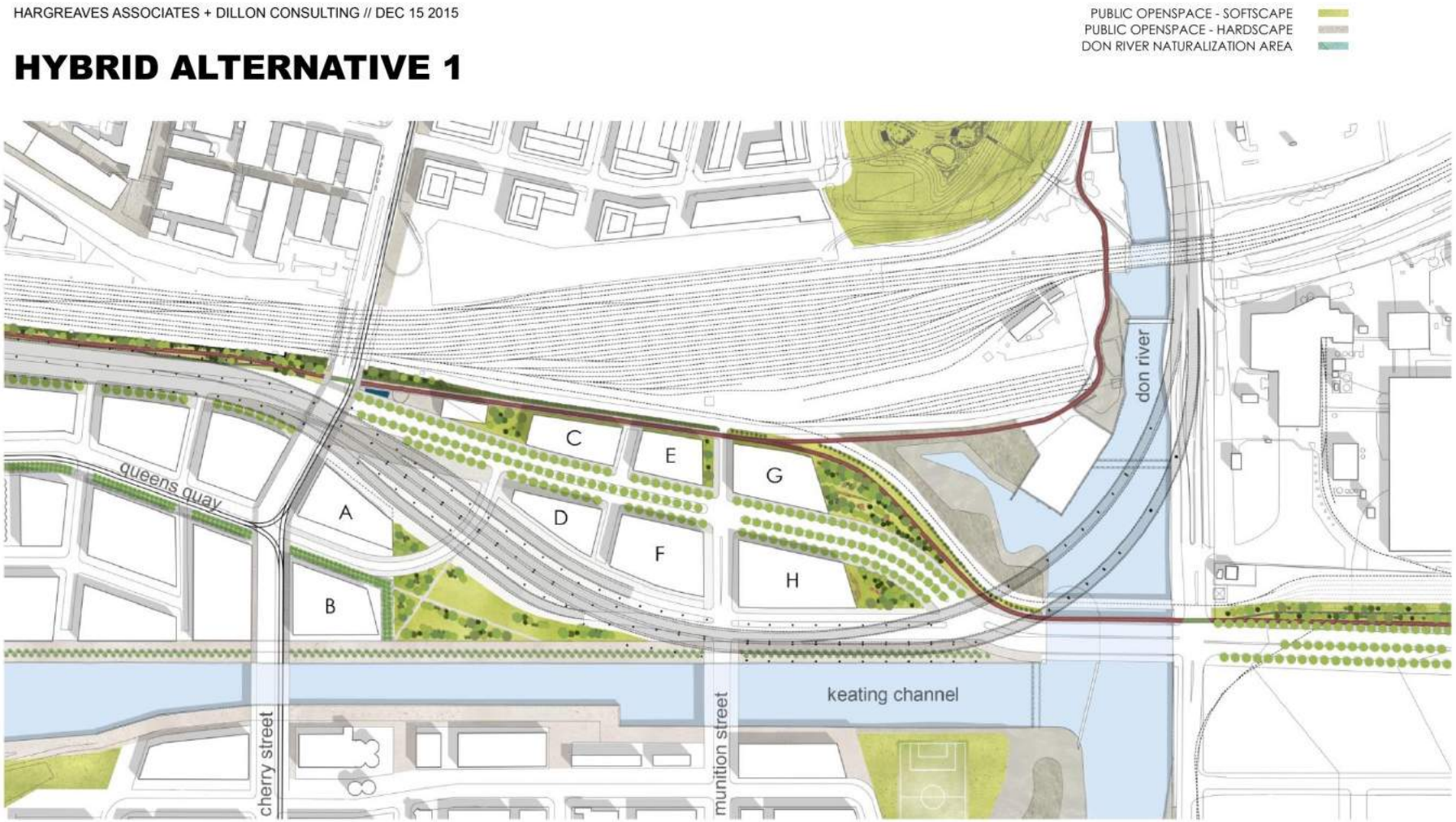


Figure 5.9: Hybrid Design Alternative 2 (Mid-Precinct) – Urban Design Plan

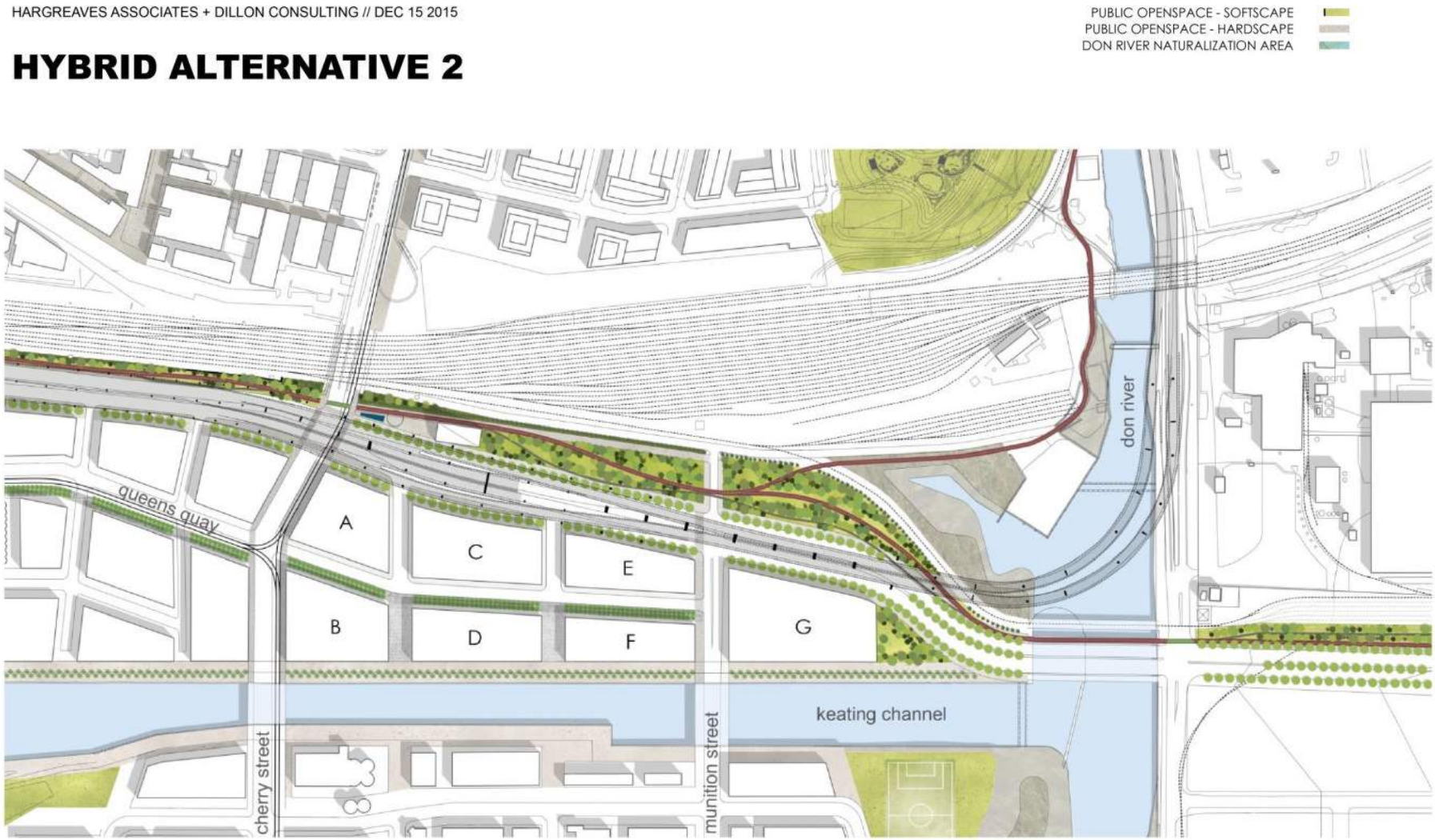


Figure 5.10: Hybrid Design Alternative 3 (North) – Urban Design Plan

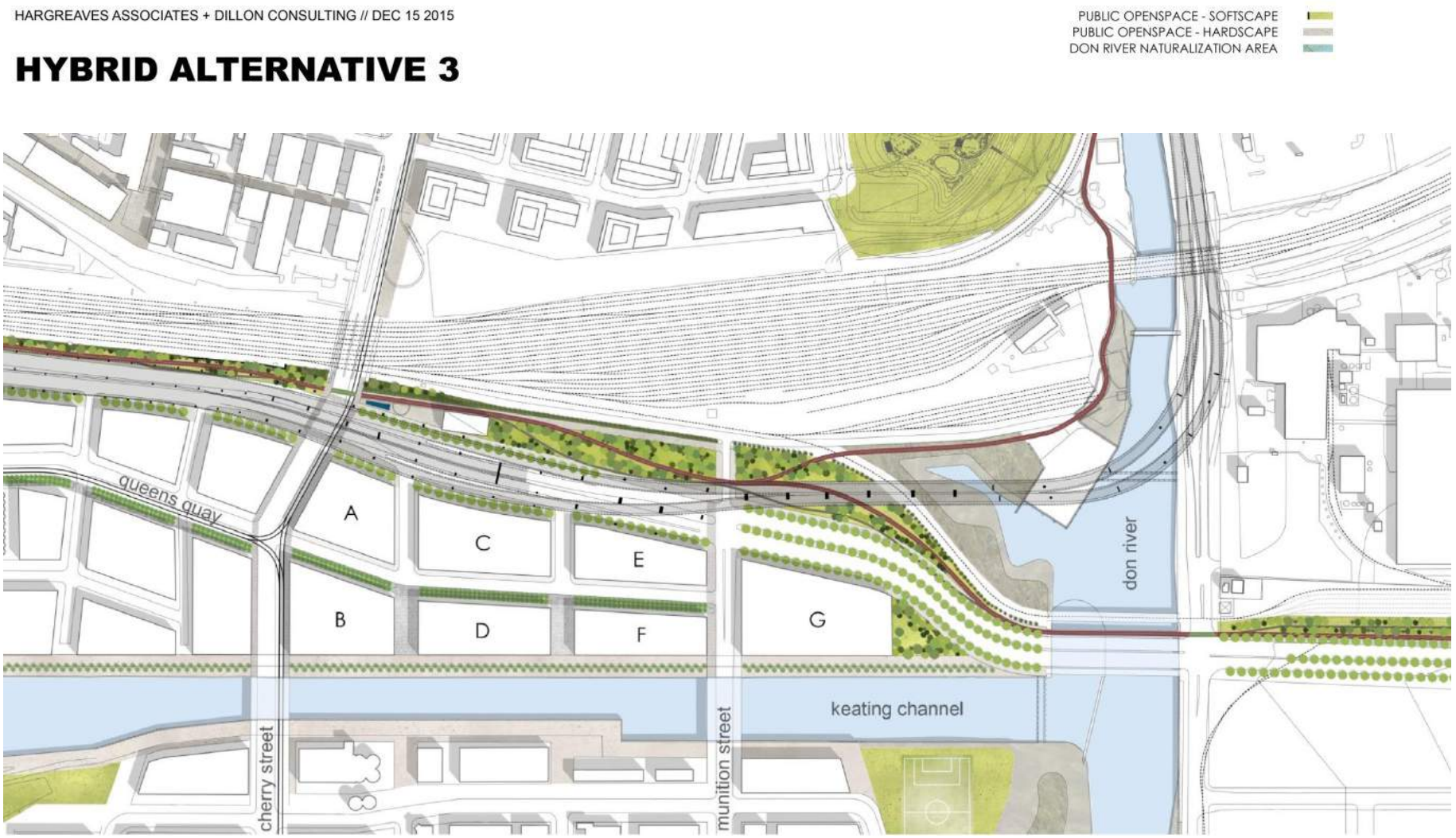


Figure 5.11: Hybrid Design Alternative 1 – Keating Channel Water's Edge Promenade – Looking West

Figure 5.12: Hybrid Design Alternative 2 – Keating Channel Water's Edge Promenade – Looking West

Figure 5.13: Hybrid Design Alternative 3 – Keating Channel Water's Edge Promenade – Looking West

Built Form

Hybrid Design Alternative 1 allows for Lake Shore Boulevard to be a two-sided street with development on the north and south sides. However, this alternative presents the greatest proportion of above-grade development that is compromised due to the proximity of the units to the elevated Gardiner structure. Although Hybrid Design Alternatives 2 and 3 do not provide for a two-sided Lake Shore Boulevard, they do present a two-sided Queens Quay which is of greater value than a two-sided Lake Shore Boulevard. This is because Queens Quay is a more pedestrian scale streetscape than Lake Shore Boulevard and would provide high-quality leasable at-grade development space, including retail. Hybrid Design Alternative 3 is preferred over Alternative 2 as it also provides the least amount of above-grade development in proximity to the elevated Gardiner structure. **Figures 5.14, 5.15** and **5.16** present the built form potential under each Hybrid design alternative.

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

Figure 5.14: Hybrid Design Alternative 1 – Keating Channel Precinct Conceptual Built Form

Figure 5.15: Hybrid Design Alternative 2 – Keating Channel Precinct Conceptual Built Form

Figure 5.16: Hybrid Design Alternative 3 – Keating Channel Precinct Conceptual Built Form

5.4.1.5 Environment Lens

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

Natural Environment

The corridor is highly degraded due to historical development and land use activities. The only natural feature of note is the mouth of the Don River/Keating Channel which is proposed to be realigned and re-naturalized. It is anticipated that the Don Mouth naturalization project would be constructed over a similar time period as the preferred Hybrid alternative and thus the river mouth and immediate upstream area would already be subject to disruption from that project. Hybrid Design Alternatives 2 and 3 present opportunities to complement the enhancement of the natural environment of the Don River with the removal of the existing Gardiner-DVP ramp connections and the redevelopment of new connections that can be more appropriately located north of the Don River mouth.

Further, the extension of Queens Quay east of Cherry Street allows for additional planting and landscaping in Alternatives 2 and 3 over Hybrid Design Alternative 1. This additional planting and landscaping could be placed along the north side of the Keating Channel that could be integrated with riparian habitat in the Channel. This would not be possible under Hybrid Design Alternative 1.

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

Social & Health

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

Water Quality

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

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

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

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

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

Cultural Resources

The evaluation of the alternatives with respect to cultural resources was based on the work completed by ASI Inc. including the completion of a Stage 1 Archaeological Assessment Report that was accepted by the Ministry of Culture, Sport and Tourism. All Hybrid design alternatives would result in similar minimal effects to cultural heritage and archaeological resources. There is potential for effect on three archaeological features (Toronto Dry Dock, Toronto Iron Works, British American Oil). No mitigation measures are required for Toronto Iron Works or British American Oil. Archaeological monitoring of construction excavation would be required for the Toronto Dry Dock. Regarding Aboriginal archaeological resources, previous 19th and 20th century developments have removed features related to traditional uses of lands by Aboriginal peoples. Effects to the activities and interests of First Nations Peoples is also not anticipated although discussions with First Nations continue.

Considering the above, for the Environment Lens, there is a preference for Hybrid Design Alternative 3, due in part to its lesser impact on the mouth of the Don River. Hybrid Design Alternative 2 is moderately preferred and Hybrid Design Alternative 1 is least preferred.

5.4.1.6 Economics Lens

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

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

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

Costing Approach

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

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

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

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

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

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

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

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

Bridge deck renewal costs for the Gardiner section west of Cherry Street to Jarvis Street, including deck replacement, superstructure/ bent repairs and steel painting, were assumed to start in 2022 with completion in seven years (2028). It was assumed that the new Gardiner decks will have a life span of 100 years, having been replaced with reinforcing materials inert to

chlorides such as stainless steel and/or Glass Fibre Reinforced Polymer (GFRP) in conjunction with high performance concrete, waterproofing membranes and asphalt protection layers.

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

The estimated costs that were developed are high-level estimates that were developed on the bases of the concept plans for each design alternative and are intended for comparative purposes.

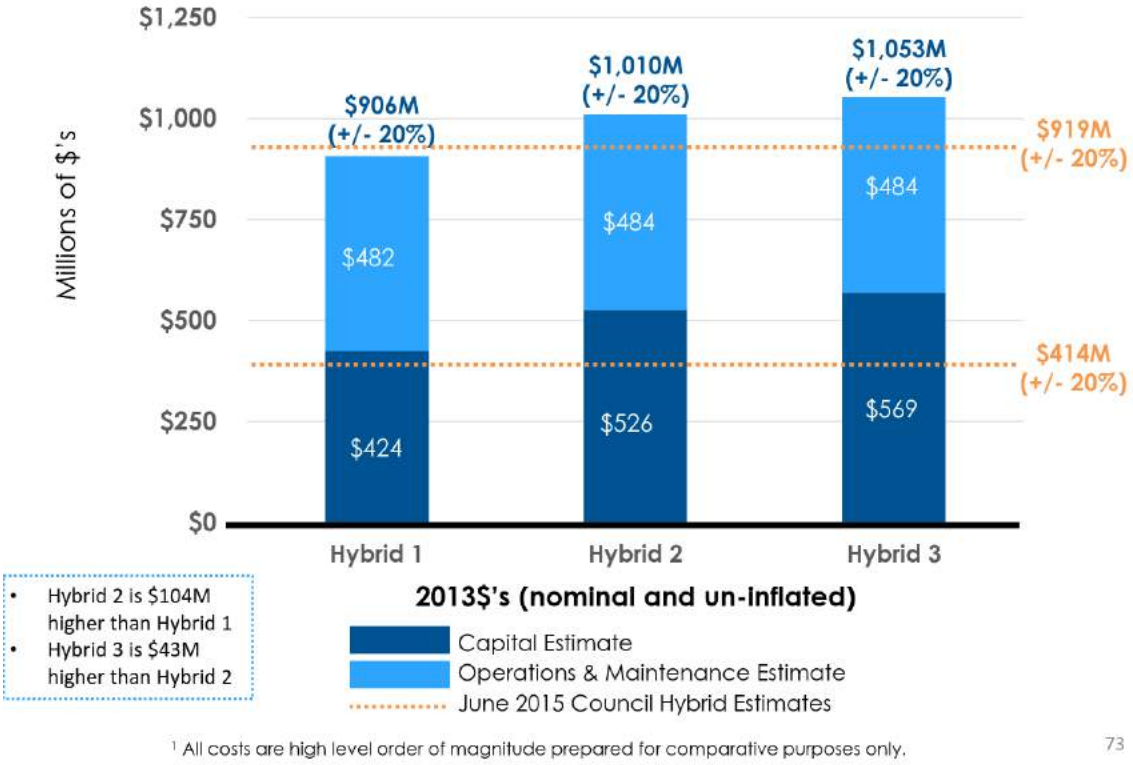
Costing Results

Figures 5.17 and **5.18** present the estimated capital costs for the three Hybrid design alternatives. The Hybrid Design Alternative 1 has the lowest estimated infrastructure capital cost at $424 million (2013$) ($267 million NPV). Design Alternative 2 has the second lowest estimated infrastructure capital cost at $526 million (2013$) ($348 million NPV) while design Alternative 3 has the highest estimated infrastructure capital cost of $569 million (2013$) ($379 million NPV). Also considered under this criterion was the measure Property Acquisition. During construction, design Alternatives 2 and 3 have the potential to require property for construction detours. Further, there is the potential need for minimal private property acquisition along the east side of the Don Roadway for Hybrid Design Alternative 3 to accommodate a more northern alignment of the new Gardiner-DVP ramp connection. Based on the Hybrid 3 concept design, about a 12 m encroachment into the First Gulf property just south of the Metrolinx rail tracks would be required. The property taking requirements will depend on the final road design and design of the flood protection landform that is required through this area to support future development on this site. As noted above, the First Gulf property acquisition costs have not been included in the total cost estimate as there may be an opportunity to work some of the ramps/roadway design into the required flood protection landform which would not be available for development. This would need to be confirmed during detailed design. Consultation with First Gulf and other relevant property owners in the area is ongoing.

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

Figures 5.17 and **5.18** provide a breakdown of the 100-year lifecycle infrastructure costs in 2013$ and NPV.

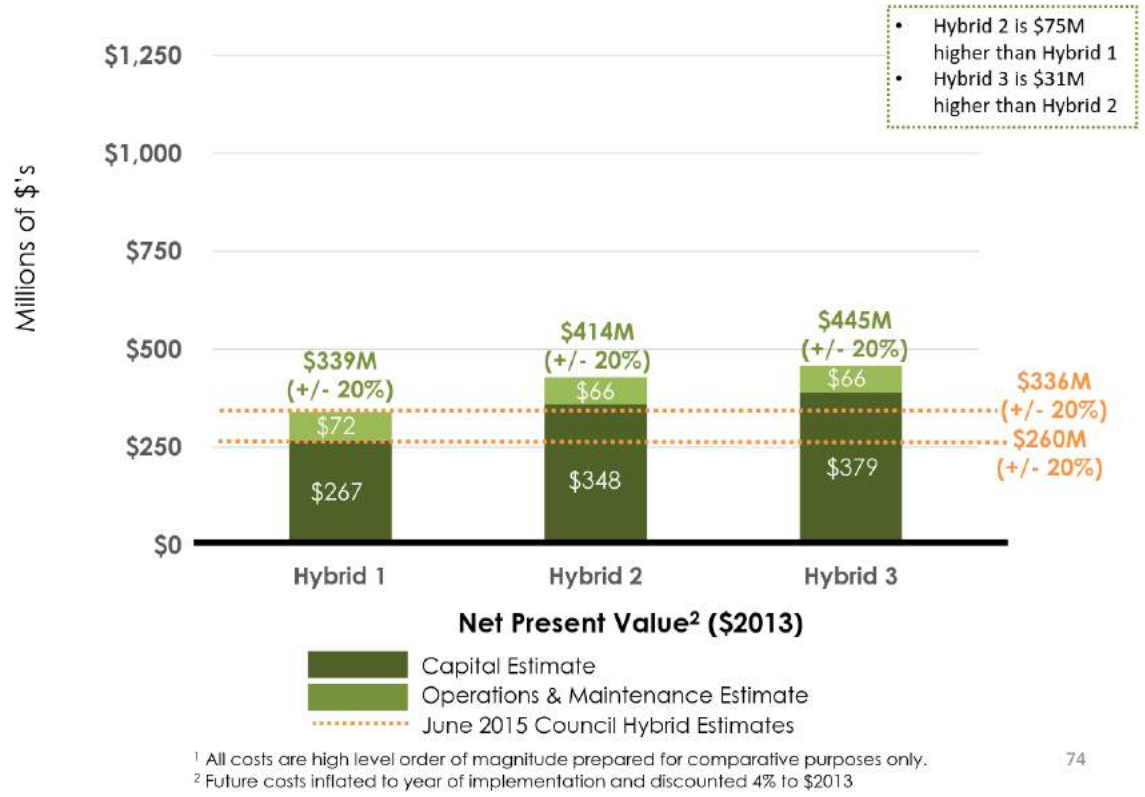
Figure 5.17: Design Alternatives Lifecycle Infrastructure Costs 2013$



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

73

Figure 5.18: Design Alternatives Infrastructure Lifecycle Costs NPV



Land Value Creation and Net Cost

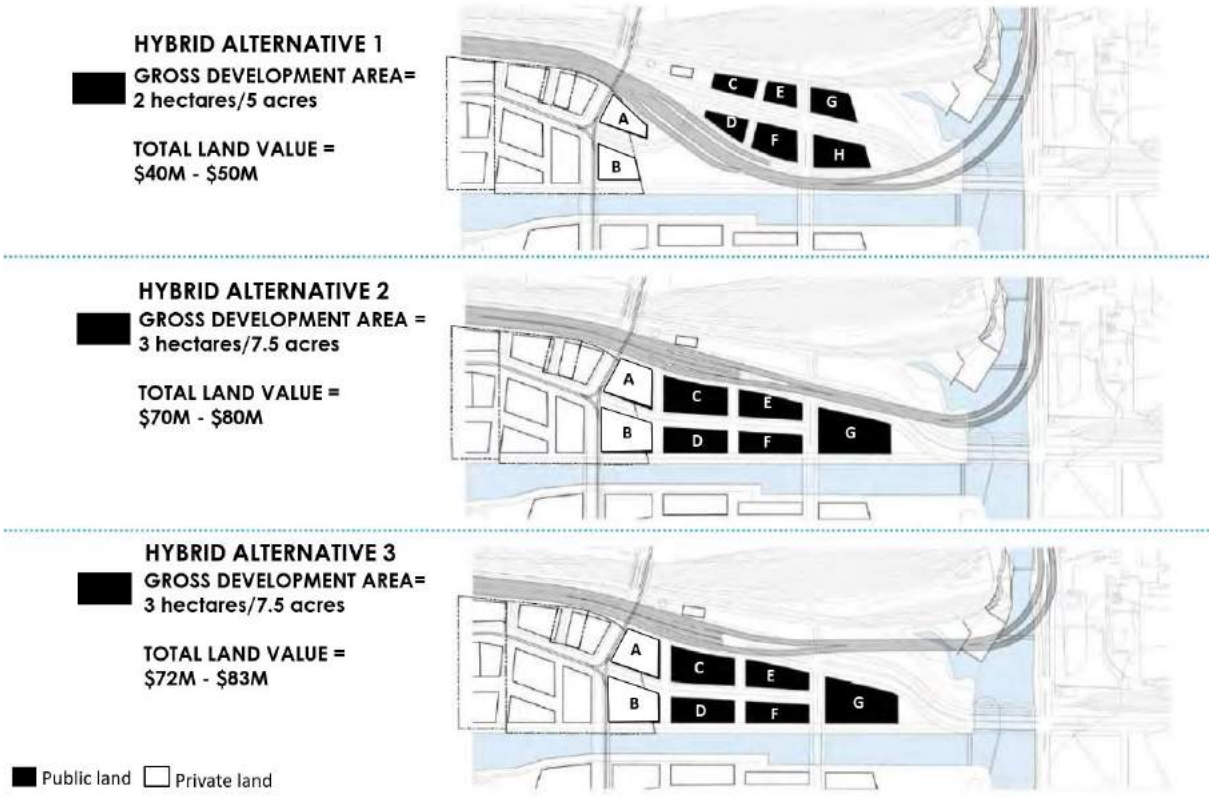
An analysis of potential revenues from the sale of City land under the three Hybrid design alternatives was undertaken by the independent firm of Cushman & Wakefield Associates who have extensive experience in the valuation of lands in Toronto including waterfront/Port Lands properties.

Figure 5.19 illustrates the estimated public land value creation for each Hybrid design alternative. The lands were valued in 2025$ as the construction of the preferred Hybrid design is expected to be largely completed by then, allowing for the release of the Keating Channel Precinct City owned properties for redevelopment at this time. Hybrid Design Alternative 1 would create 5 acres of public redevelopment land. Hybrid Design Alternatives 2 and 3 would both create 7.5 acres of public redevelopment land. This additional land results from the relocation of the elevated expressway and reduction in the expressway infrastructure through new design.

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

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

Figure 5.19: Design Alternatives Public Land Value Creation (2025$)



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

The public realm costs include the costs for the full study area extending from Jarvis Street to Logan Avenue. The results show that Hybrid Design Alternative 1 has a slightly higher public realm cost because it involves a greater length of treed median along Lake Shore Boulevard within the Keating Channel Precinct and would require more public realm design intervention to improve the water's edge promenade with the Gardiner Structure located adjacent to the Keating Channel. This additional public realm cost for Hybrid Design Alternative 1 does not change the relative cost rankings of the design alternatives.

Table 5.2: Design Alternatives Evaluation Matrix

Study Lens	Criteria Group	Criteria	Measures	Alternative Design 1	Alternative Design 2	Alternative Design 3
A. Transportation & Infrastructure	A.1 Automobiles	A 1.1 Commuter Travel Time (Modeled average travel time for AM & PM Peak Hour) Note: Transportation demand based on regional projections for growth expected by 2031 in addition to full build-out of East Bayfront, Keating, Port Lands).	Average travel times between representative Origins and Destinations Don Mills to CBD Scarborough to CBD	✓ Equally Preferred - All alternatives provide similar average travel times during peak period.	✓ Equally Preferred - All alternatives provide similar average travel times during peak period.	✓ Equally Preferred - All alternatives provide similar average travel times during peak period.
			Auto travel time sensitivity to future transit scenarios.	✓ Equally Preferred - Similar increase in travel times without planned transit projects.	✓ Equally Preferred - Similar increase in travel times without planned transit projects.	✓ Equally Preferred - Similar increase in travel times without planned transit projects.
		A 1.2 Impact on Average Auto Travel Time (AM peak hr.) Within Downtown/ Transportation Study Area	Total Volume Assigned (reflects available road capacity)	✓ Equally Preferred - 70.500 vph	✓ Equally Preferred - 70.500 vph	✓ Equally Preferred - 70.500 vph
			Percentage of vehicles experiencing increases in travel time over the future Base Case/Maintain	✓ Equally Preferred - 90% of traffic (64,500 vph) will be impacted by less than 2 min	✓ Equally Preferred - 90% of traffic (64,500 vph) will be impacted by less than 2 min	✓ Equally Preferred - 90% of traffic (64,500 vph) will be impacted by less than 2 min
			Trip Reduction/Diversion	✓ Equally Preferred - Approx 15%	Equally Preferred - Approx 15%	✓ Equally Preferred - Approx 15%
			Overall impact on auto travel in Downtown	✓ Equally Preferred - Generates similar modelled auto travel times	✓ Equally Preferred - Generates similar modelled auto travel times	✓ Equally Preferred - Generates similar modelled auto travel times
		A 1.3 Road Network Flexibility/ Choice	Ability to accommodate traffic demand on Don Roadway	● Moderately Preferred - Less flexibility to increase road capacity on Don Roadway	✓ Preferred - Greater flexibility to increase road capacity on Don Roadway	✓ Preferred - Greater flexibility to increase road capacity on Don Roadway
			Turning prohibitions at key intersections (Cherry, Munition, Don Roadway)	✓ Preferred - More turning options available at Munition St. intersection. Other intersections are equal.	● Moderately Preferred - The west to south turn to travel south on Munition St. is restricted. Can use Don Roadway to access Port Lands. Other intersections are equal.	● Moderately Preferred - The west to south turn to travel south on Munition St. is restricted. Can use Don Roadway to access Port Lands. Other intersections are equal.
			Ability to accommodate future changes to the Gardiner-LSB corridor	● Moderately Preferred - Infrastructure alignment, ramp locations and separated Gardiner-LSB limit opportunities to accommodate future changes through the corridor.	✓ Preferred - Consolidated infrastructure provides opportunity to more easily accommodate future changes to Gardiner-LSB corridor.	✓ Preferred - Consolidated infrastructure provides opportunity to more easily accommodate future changes to Gardiner-LSB corridor.
			Ability to accommodate new roadway access to major planned developments	✓ Equally Preferred - All alternatives can accommodate potential new roadway access to the planned First Gulf development.	✓ Equally Preferred - All alternatives can accommodate potential new roadway access to the planned First Gulf development.	✓ Equally Preferred - All alternatives can accommodate potential new roadway access to the planned First Gulf development.
	Automobiles Summary Ranking			● MODERATELY PREFERRED	✓ PREFERRED	✓ PREFERRED
	A.2 Transit	A 2.1 Transit Impact	Flexibility to accommodate new transit along waterfront	● Moderately Preferred - Does not permit full extension of Queens Quay into Keating Precinct and thus limits potential to accommodate Queens Quay transit extension.	✓ Preferred - Possible Queens Quay extension into Keating Precinct provides greater potential/ flexibility to expand future transit along the waterfront.	✓ Preferred - Possible Queens Quay extension into Keating Precinct provides greater potential/ flexibility to expand future transit along the waterfront.
	Transit Summary Ranking			● MODERATELY PREFERRED	✓ PREFERRED	✓ PREFERRED
	A.3 Pedestrians	A.3.1 Pedestrian Access Through Keating Precinct	Ability to implement an attractive and safe pedestrian environment that allows for east-west and north-south travel including connections at Cherry St and into the Port Lands	● Moderately Preferred - Expressway infrastructure, including proposed ramps east of Cherry Street, restrict pedestrian environment and limit potential for pedestrian connections throughout the Keating Precinct.	✓ Preferred - Integrates a more attractive and safe pedestrian environment. New overhead expressway provides opportunity for reduced columns and flexibility in location to improve sightlines. Allows for extension of Queens Quay as a pedestrian attractive street.	✓ Preferred - Integrates a more attractive and safe pedestrian environment. New overhead expressway provides opportunity for reduced columns and flexibility in location to improve sightlines. Allows for extension of Queens Quay as a pedestrian attractive street.
	Pedestrians Summary Ranking			● MODERATELY PREFERRED	✓ PREFERRED	✓ PREFERRED
	A.4 Cycling	A 4.1 East-West Movement	Ability to accommodate a continuous E-W cycling trail along the corridor	✓ Equally Preferred - Total length of existing and proposed facility is 3,690 m in length between Yonge St. and Leslie St.	✓ Equally Preferred - Total length of existing and proposed facility is 3,690 m in length between Yonge St. amd Leslie St.	✓ Equally Preferred - Total length of existing and proposed facility is 3,690 m in length between Yonge St. and Leslie St.
			Connectivity with other planned and existing bikeway facilities including Cherry St. and Don Valley	✓ Equally Preferred - Connects with planned and existing cycling facilities.	✓ Equally Preferred - Connects with planned and existing cycling facilities.	✓ Equally Preferred - Connects with planned and existing cycling facilities.
	Cycling Summary Ranking			✓ EQUALLY PREFERRED	✓ EQUALLY PREFERRED	✓ EQUALLY PREFERRED

Table 5.2: Design Alternatives Evaluation Matrix

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

Table 5.2: Design Alternatives Evaluation Matrix

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

Table 5.2: Design Alternatives Evaluation Matrix

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

Table 5.2: Design Alternatives Evaluation Matrix

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

Table 5.2: Design Alternatives Evaluation Matrix

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

5.4.2 Alternatives Comparison Summary – Keating Channel Precinct Segment

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

All of the Hybrid design alternatives facilitate:

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

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

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

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

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

The additional cost of Hybrid 3 over Hybrid 2 can be justified by its additional benefits including less potential to impact the Don Mouth sediment management activities, higher value to development blocks south of Lake Shore Boulevard, and greater section of Lake Shore Boulevard open to light and air allowing for improved public realm. Considering these benefits, combined with its public support, Alternative 3 is therefore recommended as preferred.

5.5 Alternative Designs Conclusion

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

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

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

Table 5.3: Summary of the Design Alternatives Evaluation

Preferred ✓	Moderately Preferred ●	Least Preferred ×

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

6.0 Description of Undertaking and Effects Assessment

6.1 Description of the Preferred Undertaking

On March 30, 2016 Toronto City Council endorsed the City Staff recommendation for the Hybrid 3 alternative design that was supported by the technical analysis and public consultation process undertaken during the alternative design phase of study. As such, the Hybrid 3 alternative design is the preferred undertaking for the Gardiner East Project.

The Gardiner East Project includes five distinct components:

1) The rehabilitation of the existing Gardiner Expressway deck from Jarvis Street to Cherry Street.

2) The removal of the existing expressway east of Cherry Street and the construction of a new expressway link with the Don Valley Parkway (DVP).

3) The construction of a realigned Lake Shore Boulevard from Cherry Street to Don Roadway with new ramps to and from the Gardiner Expressway.

4) Reconstruction of Lake Shore Boulevard east of the Don River to Logan Avenue including a reconstructed Don River bridge.

5) Public Realm Improvements from Jarvis Street to Leslie Street.

All items above except item 1) form the undertaking for which an EA approval under the EAA is being sought. Item 1) does not require EA approval and does not form part of the undertaking for which an approval under the EAA is being sought. The combination of the infrastructure changes noted in items 2), 3) and 4) along with the public realm improvements as per item 5) provide the complete picture of how the study area will transform as a result of the Gardiner East undertaking.

West of Cherry Street Gardiner Deck Rehabilitation

West of Cherry Street only, the elevated Gardiner deck is to be replaced. This work would be undertaken as part of the broader Gardiner Strategic Rehabilitation Program managed by City of Toronto Transportation Services. There would be no significant changes to the expressway support structure and/or ramps (with the exception of a proposed change to the Jarvis Street eastbound off-ramp that is to be reduced in length as per the Lower Yonge Precinct Plan). The

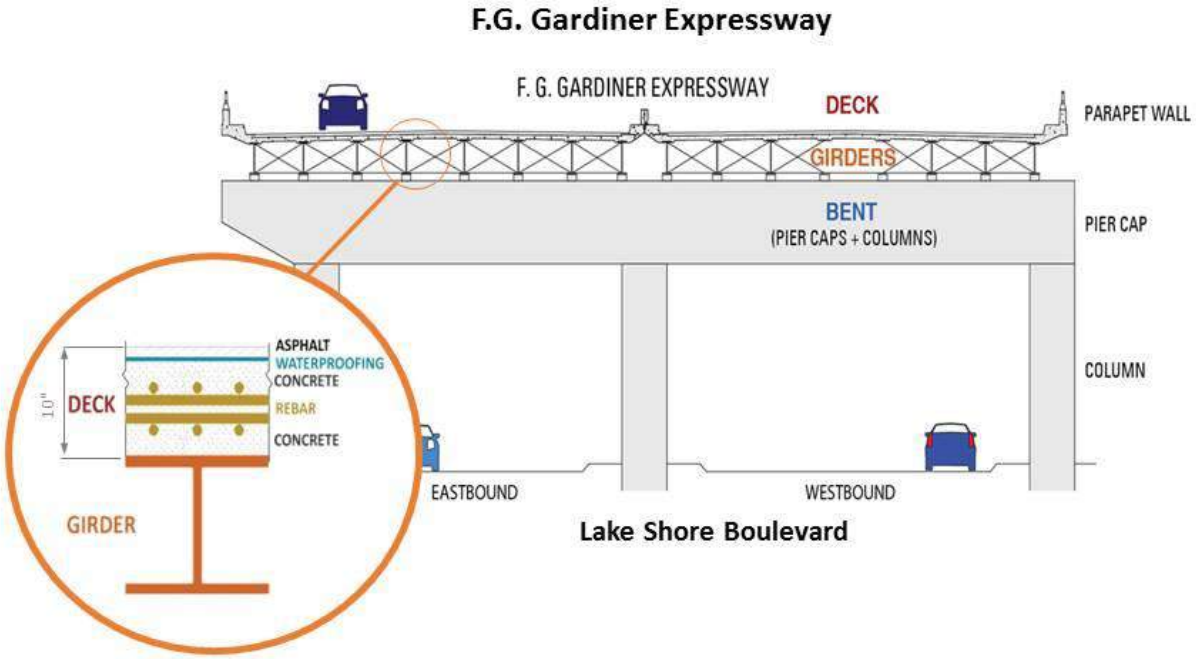
City is contemplating an accelerated deck replacement approach whereby new girders and deck segments would be prefabricated in advance, at a remote facility, and then transported to the site and placed in their final locations, using crane hoisting equipment. The existing deck would be saw-cut in sections and each deck section, together with the supporting girders, would be hoisted and removed utilizing the same equipment used to handle the prefabricated components. The timing for these works is currently projected for the 2018-2024 period.

West of Cherry Street, Lake Shore Boulevard will remain in its current configuration with modifications to streetscaping and minor intersection improvements at Jarvis Street, Sherbourne Street and Parliament Street. Along the north side of Lake Shore Boulevard there will be the addition of a new east-west multi-use trail. Public space improvements will be designed along the north and south sides of Lake Shore Boulevard to create a more inviting pedestrian environment. The details of public realm, streetscaping and trail configuration will be defined through additional study.

East of Cherry Street Gardiner Removal and New Link Construction

The existing elevated Gardiner Expressway that runs east of Cherry Street, including the connecting ramps to the DVP and the Logan ramps that are located east of the Don River, would be demolished. This would include the removal of the deck, bent/pier caps and piers/support columns. The existing column/pier support footings would require removal only if they are in conflict with any proposed new underground works, including earthworks required for landscaping, along the existing Gardiner corridor between the Don River and Cherry Street and underneath the existing DVP ramps. **Figure 6.1** illustrates the existing Gardiner components that will require removal.

Figure 6.1: Gardiner Elements Requiring Removal



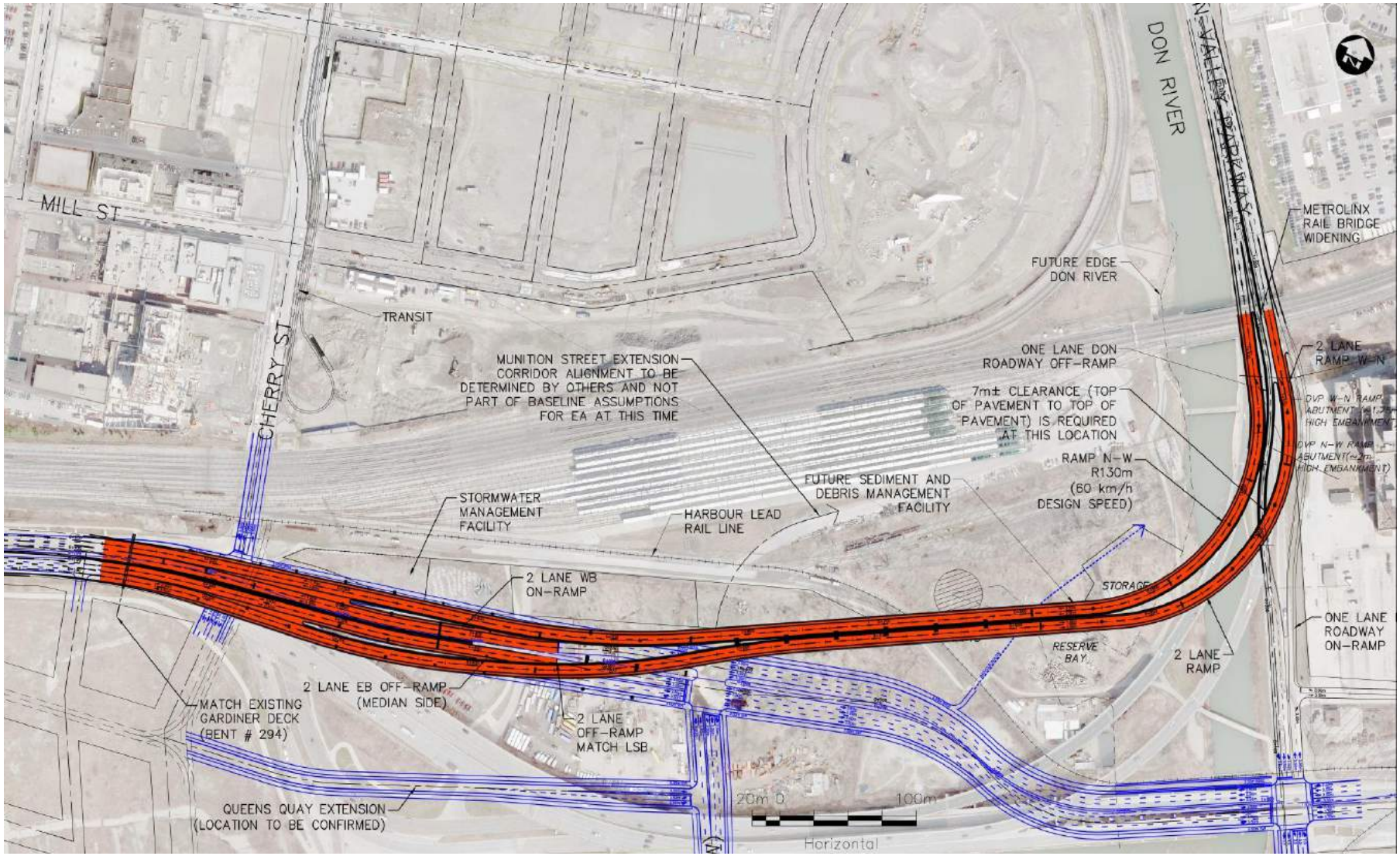
1

It is anticipated that the expressway would be removed through mechanical means. Removal would likely require mechanical splitting, concrete sawing and drilling, use of pneumatic breakers or other percussive tools to break up the concrete for removal by smaller bucket loading vehicles. Blasting will not be allowed. The photograph in **Figure 6.2** illustrates the demolition of the Gardiner's east end, east of Logan Avenue, which was removed in 2001. The debris from removal would be hauled away by truck to an appropriate disposal area. It is anticipated that the existing steel girders would be recycled.

Figure 6.2: Gardiner Deck Removal (2001) East of Logan Avenue

A new elevated expressway link would be constructed between the Gardiner at Cherry Street and the DVP, including new ramps over the Don River to connect the Gardiner with the DVP. This would include the construction of a new support structure that includes bent caps and support piers/columns with footings and piles to support the new deck. The new elevated expressway would consist of 2 lanes in each direction. It is recommended that wider right (outside) shoulders be provided on the ramps (2.5 m). Wider shoulders will provide space for safety and emergency purposes. **Figure 6.3** illustrates the proposed alignment of the new expressway link between Cherry Street and the DVP, through the Keating Channel Precinct, and shows the approximate location of the support piers. Future detailed design work will confirm the design of the facility.

Figure 6.3: Alignment of New Expressway Link with Don Valley Parkway



To facilitate the tighter 130 m radius ramp that allows for a more northern alignment of the expressway through the Keating Channel Precinct and to accommodate the reconfigured DVP/Gardiner roadway/ramp combination plus the exit and entrance ramps to Don Roadway at this location, it will be necessary to lengthen the Metrolinx rail bridge that extends over the DVP to provide for the appropriate bridge spans. **Figure 6.3** on the previous page indicates the location of the existing Metrolinx rail bridge and the bridge lengthening required. The existing bridge at this location is a four span bridge with a wide west side span over the Don River and three smaller spans east of the river. Based on the concept design of the undertaking, it is anticipated that the bridge would need to be reconstructed to replace the three eastern spans with new spans that have a total width of approximately 35 m. The design for the bridge reconstruction is to be confirmed during detailed design. Metrolinx has been an important stakeholder in this study and provided input to this EA process including recommended mitigation measures related to the bridge widening. A letter was received from Metrolinx dated May 12, 2016 outlining coordination expectations for input and reviews of designs, staging plans and specification that may relate to or affect the rail corridor or rail infrastructure as the project proceeds. Metrolinx will need to be consulted with during the detailed design and construction stages to ensure that disruption to rail traffic is minimized as much as possible. Coordination with Metrolinx will be ongoing to understand Metrolinx planned works in the study area and manage project integration.

The new alignment of the expressway also includes the construction of two new access ramps that would be located east of Cherry Street connecting the Gardiner with the realigned Lake Shore Boulevard (see **Figure 6.3**). A new 2-lane eastbound off-ramp and a new 2-lane westbound on-ramp would be constructed. These ramps would each be supported by a bridge structure that would be integrated with the structure to support the main expressway deck.

An example description of construction staging with how the Gardiner Expressway will be demolished and the new expressway constructed between Cherry Street and the DVP/Don Roadway is provided in **Appendix D, Construction Staging Report.** Included are schematic diagrams showing proposed detour roads. The construction staging considered for the EA provides one example of how the staging may occur. This will be refined during future detailed design work in consultation with other major construction projects occurring in the study area at the same time.

Other project components associated with the new expressway alignment include the requirement for additional speed reduction measures and advisory signage on the DVP and Gardiner informing drivers of the 50 km/h ramp speed in advance of the tighter ramp curves. It

is expected that speed transition zones will need to be created in advance of the ramps to slow vehicles down in steps from 90 km/h to 70 km/h to 50 km/hr.

Lake Shore Boulevard Realignment

This project component involves the development of a new alignment for Lake Shore Boulevard between Cherry Street and the Don Roadway, in the Keating Channel Precinct. The roadway would be developed as a six-lane cross section with a potential new future intersection with Munition Street should it be extended north from Villiers Island into the Keating Channel Precinct (as proposed in the Lower Don Lands TSMP EA). This realignment of Lake Shore Boulevard is consistent with the Keating Channel Precinct Plan.

The existing road surface of Lake Shore Boulevard that runs along the north edge of the Keating Channel, between Cherry Street and Don Roadway, would be removed. Further treatment of this area would be completed separately as per the Keating Channel Precinct Plan. Public realm improvements include the implementation of additional green space, pedestrian connections, streetscaping, landscaping and cycling connections throughout the Keating Channel Precinct. The public realm improvements will build on the infrastructure improvements of realigning the Gardiner and Lake Shore Boulevard through this area so as to enhance the Keating Channel Precinct.

East of the Don River, after the removal of the overhead Logan Avenue ramps, Lake Shore Boulevard would be rebuilt into a landscaped 6-lane boulevard with generous medians. **Figure 6.4** provides a cross section of the roadway through this section. The roadway would connect and transition into the existing at-grade Lake Shore Boulevard just east of where the existing Logan ramps touch down – roughly at Booth Street.

Lake Shore Boulevard/Don River Bridge

The Lake Shore Boulevard Bridge over the Don River will need to be rebuilt to provide sufficient width for: 6 travel lanes, an eastbound left turn lane to access the northbound Don Roadway/ DVP, a multi-use trail, and sidewalk.

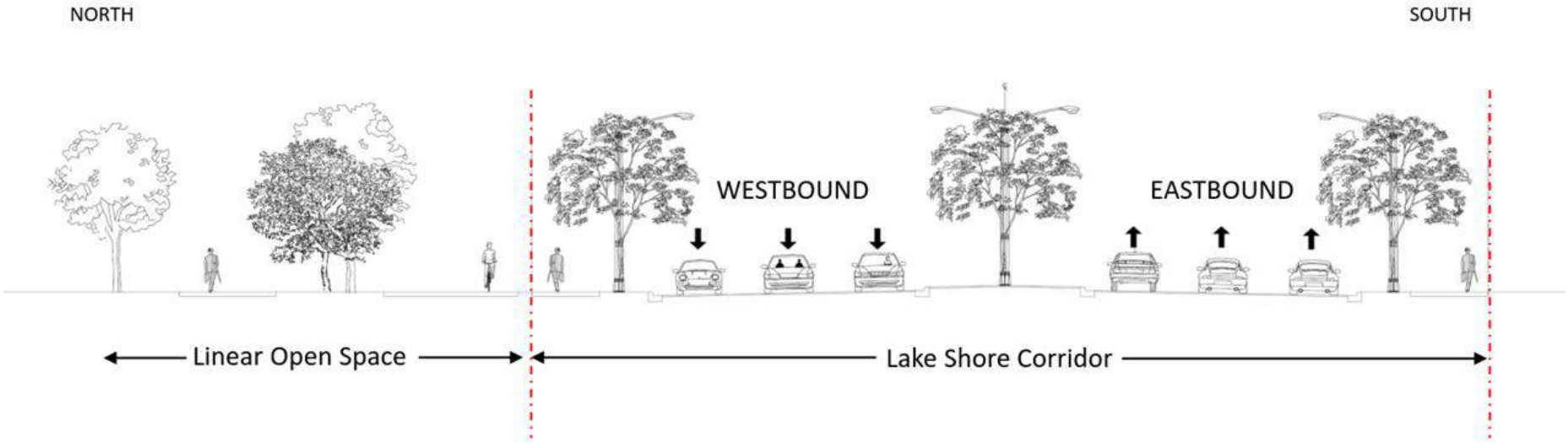
It is noted that modifications to the Lake Shore Boulevard bridge over the Don River have been previously proposed in the approved EA reports for the *Lower Don Lands Master Plan, Keating Channel Precinct Environmental Study Report* and the *Don Mouth Naturalization and Port Lands Flood Protection Project* (DMNP Project). The previous studies identified that the new Lake Shore Boulevard-Don River bridge would involve retaining the existing bridge and providing three new spans to the west to accommodate the widening of the Don River Mouth in order to provide the Don Mouth flood protection, and sediment and debris management works. The selection of

this bridge modification option in those studies was based, for the most part, on the existence of the overhead Gardiner Expressway structure in the immediate bridge area as per the current condition.

With the removal of the overhead Gardiner Expressway in the vicinity of the Lake Shore Boulevard-Don River bridge, there may be other opportunities for bridge re-design / modifications to improve river conveyance and sediment management operations north and south of Lake Shore Boulevard. This could include the raising of the future Lake Shore Boulevard-Don River bridge soffit and reducing the number of piers to support the structure. This could further enhance the Don River Mouth naturalization efforts. It is recommended that more detailed examination be completed on this opportunity in coordination with TRCA during future detailed design work.

In addition to rebuilding the Lake Shore Boulevard-Don River bridge crossing, the industrial rail spur connection that links the rail facilities west of the Don River to the east and provides rail access to the Port Lands area will be maintained. This will involve constructing a new rail crossing over the Don River. For the purposes of this EA it has been assumed that a separate rail bridge structure located immediately north of the new Lake Shore Boulevard-Don River bridge would be constructed. It may be possible to integrate the rail bridge into the reconstructed Lake Shore Boulevard bridge. This will be explored as part of detailed design. In addition, opportunities to raise the soffit height of the railway spur bridge will also be explored at detailed design in coordination with TRCA and the appropriate stakeholders.

Figure 6.4: Lake Shore Boulevard Design East of Don River



6.2 Planned Public Realm Improvements

This section presents public realm improvements proposed for the corridor. The project co-proponents are committed to improving the public realm adjacent to Lake Shore Boulevard. The improvements outlined here require further refinement and detailed design through future study as directed by Council. The recommended corridor public realm improvements recognize the following:

- For the western segment (Jarvis Street to Cherry Street), through the alternative solutions phase of the EA study, it was determined that there would be no significant infrastructure changes to the corridor west of Cherry Street. At the June 10, 2015 City Council Meeting, Council recommended that the western segment of the Gardiner-Lake Shore Boulevard corridor be maintained with the full traffic function that exists today (retaining the same number of roadway lanes and ramps). Although there will be no major infrastructure changes, there will be improvements to the public realm in this area through streetscaping, a multi-use trail and modifications to the intersections. These improvements will focus on enhancing the pedestrian experience, improving pedestrian crossings, connecting a new east-west multi-use trail on the north side of Lake Shore Boulevard, and providing improved hard and soft landscaping along the underutilized edges of Lake Shore Boulevard.
- Between Cherry Street and the Don River, the planned public realm improvements complement the infrastructure changes for the proposed undertaking (Hybrid 3, the recommended preferred alternative design for this section). With the realignment of Lake Shore Boulevard and the new configuration for the Gardiner Expressway through this area, there will be a significant transformation and opportunities for improved public realm that includes prominent new public space. This includes streetscaping and landscaping throughout the network of new streets proposed in the area, improved Keating Channel public space, additional open space and significant streetscaping along the opened up Lake Shore Boulevard that will have access to light and air. Through this area will also be the new east-west multi-use trail north of Lake Shore Boulevard.
- For the section from Don Roadway to Logan Avenue, for the undertaking the existing Logan Ramps would be removed and Lake Shore Boulevard would be rebuilt within the same road right-of-way. This rebuilt boulevard would connect with the existing Lake Shore Boulevard east of Logan Avenue. Lake Shore Boulevard is a six-lane boulevard from just east of Logan Avenue to Leslie Street. To the west, the rebuilt

roadway would connect with the proposed realigned Lake Shore Boulevard at the current Don River bridge location (which will also be a six-lane roadway). Streetscaping improvements will be made on both the north and south sides of Lake Shore Boulevard to improve what exists today and to provide new pedestrian connections. The existing multi-use trail on the north side of Lake Shore Boulevard will remain in this area. Opportunities to improve the public realm through landscaping and improved pedestrian crossings are encouraged.

It is important to note that the corridor east of Cherry Street passes through a part of the waterfront that is undergoing extensive study that will result in changes to land use and the transportation network. In particular, the plans for the neighbourhoods on either side of Lake Shore Boulevard east of the Don Roadway (Port Lands and South of Eastern) are still being developed and will influence the public realm and streetscape design of Lake Shore Boulevard. This includes the potential for new north-south street intersections, transit and cycling connections. This EA study has included, where possible, consideration for these developing plans and the design allows for some flexibility to accommodate future modifications if needed. Improvements to public realm throughout the corridor will need to be coordinated with relevant precinct plans and planning frameworks to provide a consistent design language that achieves the public realm revitalization goals for the waterfront. The public realm improvements recommended in this EA will be confirmed and refined through a coordination effort led by the co-proponents (which will occur under separate study from this EA). More detailed plans for public realm design throughout the Gardiner – Lake Shore Boulevard corridor should include consideration for opportunities to maintain a high-quality public realm in the vicinity of an elevated expressway. This may include considerations for managing effects of winter salt applications, managing potential impacts to landscaping and public space related to stormwater management and surface runoff contaminants, as well as opportunities to improve the pedestrian and cycling experience related to noise and air quality.

Although Lake Shore Boulevard has unique public realm conditions depending on the segment of the study area, there are elements of the public realm design plans that extend throughout the study corridor. These include pedestrian and cycling network connections, streetscape improvements and open space concepts as described below.

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

Pedestrian Network and Cycling Connections – Extending the length of the study area is a proposed new multi-use trail. The trail would be located along the north side of Lake Shore Boulevard. Along this north side would also be an associated greenway which varies in size depending on the dimensions of the space available.

Key north-south connections across the corridor that link into the new multi-use trail along Lake Shore Boulevard include planned or proposed improvements on Yonge Street, Sherbourne Street, and Cherry Street. As the Villiers Island Precinct, Port Lands and South of Eastern area plans evolve, additional important north-south connections across the corridor are anticipated.

The pedestrian network will also be enhanced through the implementation of continuous sidewalks along the north and south sides of Lake Shore Boulevard, where possible. Improved pedestrian connections will enhance connectivity throughout the Central Waterfront and between the planned precincts. As a key principle of the CWSP, improved pedestrian connections will be prioritized throughout the study area with attention paid to how connections may facilitate the revitalization of the waterfront.

Figure 6.5 provides an example rendering of what the multi-use trail could look like in the western section of the study area between Jarvis Street and Cherry Street.

Figure 6.5: Example Rendering of Pedestrian and Multi-Use Trail (east of Sherbourne Street looking west)

Open Space/Linear Greenway – A system of new open space referred to as a greenway is proposed along the north edge of Lake Shore Boulevard for the entire extent of the study corridor. The greenway would include primarily passive recreational spaces to provide an improved balance of green space including tree planting among the road infrastructure to enhance the pedestrian experience. There may be locations where more active recreational uses such as small skateboard parks would be possible.

Public Realm, Public Art and Animation – There are many public realm design interventions that can be applied throughout the study area that do not require infrastructure changes. These include landscaping, public art installations and animation of the existing public realm and open spaces with temporary market space, pedestrian squares, light, and art installations. Planning for public art along the corridor would occur through separate City and Waterfront Toronto public art plans and implementation tools.

Streetscaping – Improved streetscaping will be completed throughout the corridor on the north and south sides of Lake Shore Boulevard. This may include tree planting/landscaping and a continuous pedestrian sidewalk on the south and north sides of the street.

Intersection Improvements – At the existing Lake Shore Boulevard intersections throughout the corridor (at Jarvis Street, Sherbourne Street, Parliament Street, and Cherry Street), improvements will be made to:

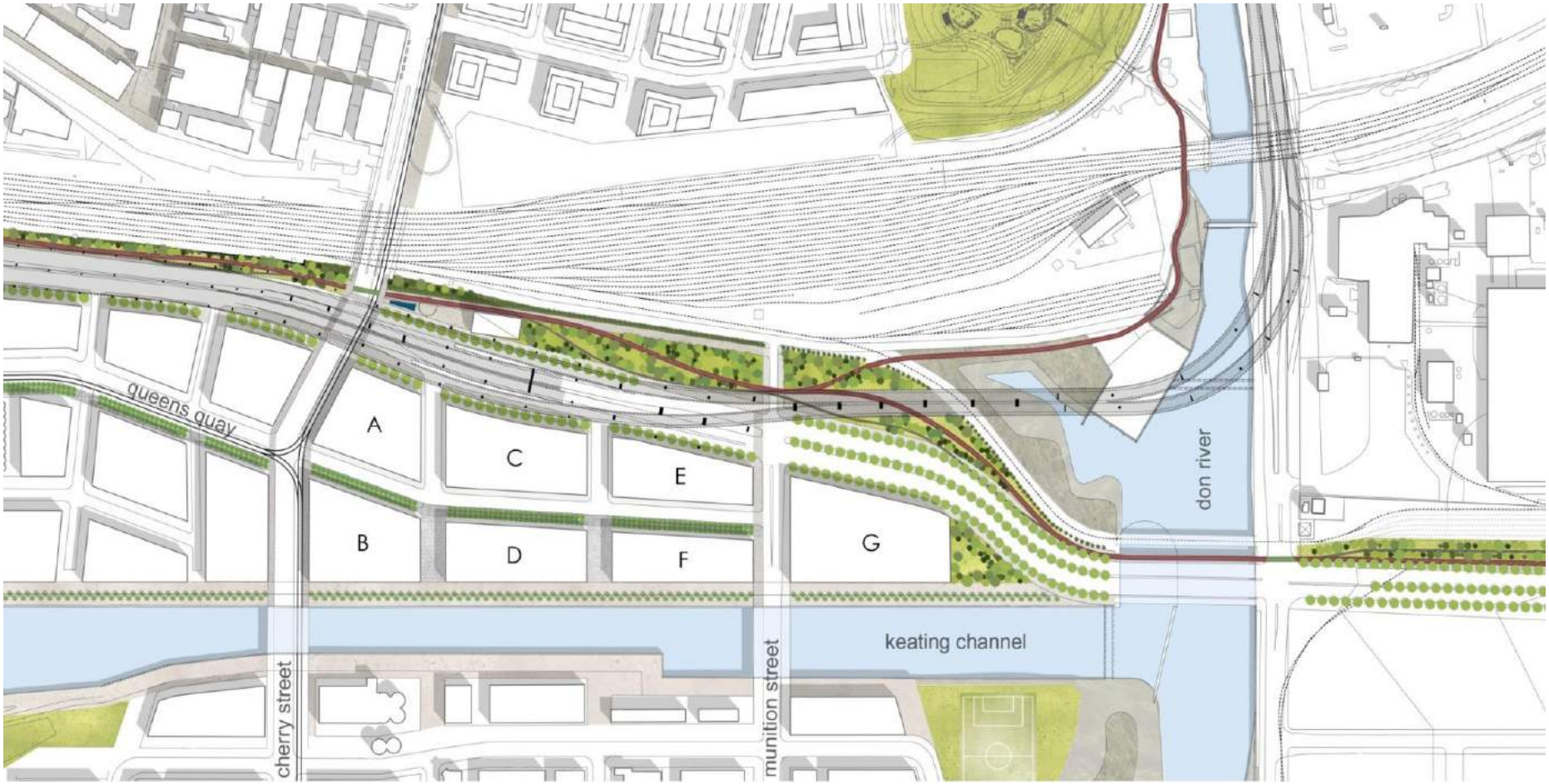
- Regularize the intersections where possible to reduce pedestrian crossing distances and improve the legibility of the intersection movements for drivers;
- Reduce turning lanes to improve walkability;
- Provide texture to road surface to demark pedestrian crossing areas. This can be done in coordination with line painting (including zebra markings);
- Add bollards to the pedestrian refuge medians to provide additional safety and separation between pedestrians and vehicles;
- Implement north-south curb enlargements that will allow for bike lanes to be incorporated;
- Increase the setback of intersection stop lines to support safe pedestrian crossings; and,
- Implement hard and soft landscaping along Lake Shore Boulevard to improve the pedestrian and cycling experience.

An example rendering of potential intersection improvements is provided in **Figure 6.6.**

Public Realm Phasing and Implementation Strategy – A coordinated urban design implementation strategy for the corridor will be completed to provide a consistent public realm design for the corridor. The strategy will identify opportunities to integrate with complementary projects within or proximate to the Gardiner East EA study area. The strategy will include a phasing plan and will identify how proposed public realm improvements can best be coordinated among other initiatives including the Port Lands Planning Framework and the Keating Channel Precinct Plan. In addition, the Keating Channel Precinct Plan will need to be reviewed to reflect the Gardiner East EA undertaking. **Figure 6.7** presents a conceptual plan for the improvements in the Keating Channel Precinct along Lake Shore Boulevard between Cherry Street and the Don Roadway.

Figure 6.6: Example Rendering of Intersection Improvements (Cherry Street and Lake Shore Boulevard)

Figure 6.7: Hybrid 3 Conceptual Design Plan between Cherry Street and Don Roadway (Keating Channel Precinct)



6.2.1 Don Roadway to Leslie Street Public Realm

East of the Don River, the Gardiner Expressway will be removed and a boulevard design will be constructed for Lake Shore Boulevard. The design of the boulevard will generally mirror the design of Lake Shore Boulevard east of Carlaw Avenue. Improvements to the design may include:

- Enhanced tree planting;
- A wider pedestrian median for pedestrian refuge to cross the boulevard;
- Improved paving materials and line painting (including zebra markings) to differentiate intersection crossings and pedestrian, cycling and automobile spaces;
- Enhanced landscaping on the north edge supporting the multi-use trail; and,
- Improved pedestrian sidewalk on the south side of the street.

The public realm plan for the section of Lake Shore Boulevard east of the Don Roadway will be coordinated with the plans for the Port Lands and South of Eastern area.

6.3 Effects to the Environment

6.3.1 Effects Assessment Approach

The provincial EA process requires proponents to identify and describe in detail the potential effects on the environment from the proposed undertaking as well as the measures that would be implemented to reduce or possibly avoid those effects. The assessment uses a broad definition of environment, as stipulated in the Ontario *EA Act*, which includes natural, social, economic and cultural components.

The impact assessment has been developed to provide a certain degree of flexibility in project design and how it would be constructed. This flexibility is required to accommodate potential changes to the conceptual design, construction methods, and baseline conditions including the evolution of other planned projects in the study area. These potential changing circumstances would be considered during the detailed design and construction phases of the project. The approach to accommodate these potential changes is provided in **Chapter 8** which includes an outline as to how identified project design changes will be considered, including the assessment of effects from those changes to ensure the integrity of the EA.

The effects assessment was completed for the near-term construction period and the long-term operation period. The construction period is expected to last for approximately six years (2020-2025). For the assessment of construction effects, it has been assumed that current baseline conditions would exist. It is noted that the area to be subject to the most significant construction activity, Cherry Street to Don Roadway/DVP, consists of lands that are largely vacant. This is also the area in which part of the DMNP will occur. The construction effects assessment considers the coordination of the Gardiner East undertaking and the DMNP undertaking should these two projects be constructed during a similar time period. This includes consideration for how traffic detours will be planned and constructed to accommodate the construction of both projects. The long-term operations period assumes that full build-out of the study area has been achieved, including the naturalization and habitat restoration of the Don River.

In completing the assessment of effects, mitigation measures have been identified to minimize or reduce the identified adverse environmental effects. These identified mitigation measures form part of the commitments for this undertaking.

6.3.2 Effects Assessment

The assessment of the undertaking was based on evaluation criteria and measures that were developed by the co-proponents and the Consulting Team that reflect the study area, project characteristics and the input received from stakeholders through the course of the EA study. Unlike the previous evaluation steps of the EA (e.g., evaluation of alternative solutions and alternative designs), these criteria are not comparative as we are not comparing facilities. Rather, these criteria provide structure to the assessment of project effects to help in the identification of measures to reduce these effects. The effects assessment was also completed to aid in the assessment of the advantages and disadvantages of the project that is presented in **Section 6.6**. For each of the criteria, one or more measures were developed. The measures specify the data to be collected and/or the effects to be assessed for each criterion. The criteria reflect the four study lenses, Transportation and Infrastructure, Urban Design, Economics and Environment, and are organized on the basis of the following criteria groups:

- Transportation
- Public Safety
- Planning and Urban Design
- Social and Health
- Natural Environment
- Cultural Resources
- Economics

Table 6.1 identifies the effects (environmental interactions) that are expected to occur for each of the major project construction activities. The table focuses on the interaction of construction activities and not the operations of the facilities. Based on the construction period interactions presented in **Table 6.1**, **Table 6.2** presents a summary of the projected project construction related effects, proposed mitigation measures and identifies the net residual effects. **Table 6.3** presents a summary of the projected project operations period related effects, proposed mitigation and monitoring measures, and identifies net residual effects.

Following **Tables 6.1-6.3**, detailed subsections provide a summary description of the more notable effects of the project by each of the seven criteria groups noted above. This description is organized by the construction and operation periods.

Table 6.1: Construction Period – Project/Environmental Component Interaction

Not Affected (NA), Positive Interaction (+), Negative Interaction (–)

Project Activity (Construction)	Construction Support Facilities (e.g., Staging Areas, Casting/Assembly Yards, Concrete Batch Plant, etc.)	Vegetation Removal / Protection	Topsoil Removal/ Stockpiling / Disposal	Utility Relocations	Construction of Road Detours and Temporary Traffic Facilities	Removal of Gardiner/DVP Ramp Decks and Superstructure	Installation of Bridge Superstructure and Deckworks (including for new Don River/LSB & Rail Bridges)	Roadworks and Retaining Walls	Electrical Works (Signals, Illumination)	Installation of Public Realm & Streetscape Elements	Installation of Signage and Lane Markings
Auto travel time delays	NA	NA	NA	NA	–	–	–	–	–	NA	–
Transit travel delays	NA	NA	NA	–	–	–	–	–	NA	NA	NA
Impact to pedestrian Movement	NA	NA	NA	–	–	–	–	–	NA	–	NA
Impact to cyclist movement	NA	NA	NA	–	–	–	–	–	NA	–	NA
Safety risks to pedestrians	NA	NA	NA	NA	–	–	–	–	NA	–	NA
Safety risks to cyclists	NA	NA	NA	NA	–	–	–	–	NA	–	NA
Safety risks to motorists	NA	NA	NA	NA	–	–	–	–	NA	NA	NA
Impact with other projects and initiatives	NA	NA	NA	–	–	–	–	–	NA	–	NA
Change in views and viewscapes	–	–	–	–	–	–	–	–	NA	NA	NA
Effects from contaminated soil disturbance	NA	NA	–	–	–	–	–	–	–	–	NA
Change in air quality	–	–	–	–	–	–	–	–	NA	NA	NA
Change in noise levels	–	–	–	–	–	–	–	–	–	–	–
Vibration effects	NA	NA	NA	NA	–	–	–	–	NA	NA	NA
Traffic diversion effects on neighbourhoods	NA	NA	NA	NA	–	–	–	–	NA	NA	NA
Impacts on recreation use	NA	NA	NA	NA	NA	NA	–	–	NA	–	NA

Project Activity (Construction)	Construction Support Facilities (e.g., Staging Areas, Casting/Assembly Yards, Concrete Batch Plant, etc.)	Vegetation Removal / Protection	Topsoil Removal/ Stockpiling / Disposal	Utility Relocations	Construction of Road Detours and Temporary Traffic Facilities	Removal of Gardiner/DVP Ramp Decks and Superstructure	Installation of Bridge Superstructure and Deckworks (including for new Don River/LSB & Rail Bridges)	Roadworks and Retaining Walls	Electrical Works (Signals, Illumination)	Installation of Public Realm & Streetscape Elements	Installation of Signage and Lane Markings
Loss of terrestrial features & habitat	–	–	–	NA	NA	NA	NA	NA	NA	NA	NA
Disruption to terrestrial features & habitat	–	–	NA	–	–	NA	–	–	NA	–	NA
Loss of aquatic features & habitat	NA	NA	NA	NA	NA	–	–	NA	NA	NA	NA
Disruption to aquatic features & habitat	–	–	–	NA	–	–	–	NA	NA	NA	NA
Change in surface water quality from storm run-off	–	–	–	NA	–	–	–	NA	NA	–	NA
Impact on Don River flood conveyance	NA	NA	NA	NA	–	–	–	NA	NA	NA	NA
Potential for change to microclimate/ heat island effect	NA	–	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ability to accommodate storm event changes from climate change	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Removal of built heritage features	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Change to cultural landscape	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Impact on archaeological resources	–	NA	–	–	–	NA	–	–	NA	NA	NA
Impact on First Nations People and activities	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Project Activity (Construction)	Construction Support Facilities (e.g., Staging Areas, Casting/Assembly Yards, Concrete Batch Plant, etc.)	Vegetation Removal / Protection	Topsoil Removal/ Stockpiling / Disposal	Utility Relocations	Construction of Road Detours and Temporary Traffic Facilities	Removal of Gardiner/DVP Ramp Decks and Superstructure	Installation of Bridge Superstructure and Deckworks (including for new Don River/LSB & Rail Bridges)	Roadworks and Retaining Walls	Electrical Works (Signals, Illumination)	Installation of Public Realm & Streetscape Elements	Installation of Signage and Lane Markings
Impacts to goods movement	NA	NA	NA	–	–	–	–	–	–	–	–
Impact on downtown mobility	NA	NA	NA	NA	–	–	–	NA	NA	NA	NA
Impact on local business activity	NA	NA	NA	NA	NA	–	–	–	NA	NA	NA

Table 6.2: Construction Period Net Effects

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
TRANSPORTATION			
Impact to auto travel time	The degree of impacts to auto travel times will depend on the construction staging/phasing and traffic management approach adopted by the Contractor. Potential travel and access effects and impacts and issues include the following: ● Safety considerations will preclude the removal of major deck panels and substructure components over live traffic or public / inhabited areas. This will require the periodic shut down of lanes and/or sections of Lake Shore Boulevard during deck removal. ● Sections of expressway and surface roads will require lane reductions or complete shut down during periods of construction of the new bridge decks and related facilities. This is expected to involve sections of the Gardiner, Don Valley Parkway, Don Roadway, Cherry Street and Lake Shore Boulevard. ● The total number of available east-west lanes in the Gardiner – Lake Shore Boulevard corridor will be reduced during construction due to the need to provide sufficient working areas for the new construction work. ● It is expected that auto travel time delays will occur during these periods. ● Access to/from the site by construction vehicles could also contribute to additional traffic congestion in the local area. Nearby access to DVP and Gardiner expected to minimize construction vehicle disturbance effects on the local community.	● The contractor will be required to maintain a specified minimum number of total east-west lanes open to traffic throughout the construction period. This will likely involve the construction of temporary lanes on other area roads as operating lanes are shut down for construction. Traffic will be directed to use other existing and/or widened roadways and constructed detour roads during these periods. See draft Construction Phasing Plan for proposed detour roads (subject to finalization during detailed design). ● Advanced notification and signing will advise motorists of lane reductions and closures. ● New construction work can be staged to allow the existing Gardiner corridor to remain partially operational during construction. ● Example, possible staged construction and the introduction of temporary works/local detour routes include the following: ○ Early replacement of the eastern spans of the Metrolinx rail bridge over the Don River/DVP will allow the establishment of a widened Don Roadway as a new, temporary exit/entrance to the DVP while the existing DVP-Gardiner ramps are removed; ○ Phased construction of portions of new Lake Shore Boulevard and the new Lake Shore Boulevard-Don River bridge to allow maximize use for east-west traffic during; ○ Establish a Commissioners Street and/or Villiers Street detour routing to divert Lake Shore Boulevard traffic around the Gardiner East Ramp structures and the Lake Shore Boulevard-Don River bridge. This may	● Temporary travel time delays to auto users due to lane reductions and temporary road closures.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
		include the construction of a new, temporary crossing of the Keating Channel east of Cherry Street; ○ Staged removal and construction of existing Gardiner deck and DVP ramps to allow traffic to use existing deck lanes during construction; ○ Widen the Jarvis-Gardiner ramps to two lanes to facilitate access. ● Carry out as much of the bridge deck demolition work as possible on weekends/overnight to avoid the need to shut down sections of the Lake Shore Boulevard during the busier weekday periods ● Construction delays to emergency vehicle service (EMS, fire, police etc.) will be minimized by: ○ Regular communication with Emergency Services during construction; ○ Meeting with Emergency Services prior to construction start; ○ A requirement in the construction contract for a, "Emergency Service Provider Notification," to notify Emergency Services in advance of construction start and prior to any full closures.	
Impact to transit travel	● There are no transit facilities located on the Gardiner-Lake Shore Boulevard corridor in the study area. As such there will be no direct impact to transit operations. ● Transit routes utilizing Cherry Street through the Gardiner-Lake Shore Boulevard corridor (e.g., Route 172) may be affected by traffic restrictions due to overhead bridge works. ● The project requires the widening of the Metrolinx Don River/DVP Rail Bridge underpass and may also require relocation of utilities adjacent to the Metrolinx rail corridor (e.g., hydro tower on west side of Don River). And while major disruptions to GO Train service are to be avoided, there is the potential for some minor delays. ● During periods of traffic detouring, other nearby roadways could experience increase in auto traffic volumes which could lead to	● Advanced warning and advertising will advise transit users of possible travel time delays during periods of road closures. ● Co-proponents to explore with transit providers, including Metrolinx and Toronto Transit Commission, potential to increase service levels during these periods. ● Co-proponents to coordinate with Metrolinx re: opportunities for joint work on site related to track upgrades so as to minimize impacts to rail service.	● Potential for periodic/temporary increase in transit travel times including on Cherry Street south of Lake Shore Boulevard.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
	slower street transit travel (e.g., for King and Queen Streets). ● Commuters may opt to use transit instead of driving during periods of road closures which could put more user pressure on the transit system.		
Impact to rail (freight) transportation	● The project requires the construction of a new rail spur bridge over the Don River (north of Lake Shore Boulevard-Don River bridge) and will require either the establishment of temporary rail works/bridge crossing or temporary closure of the existing spur line, depending on finalizing rail access needs to the east of the Don River.	● Co-proponents to explore with freight rail users the potential to reduce rail spur line use during construction periods as needed. ● Co-proponents to coordinate with TRCA and other stakeholders to integrate rail spur works with DMNP works related to sediment management area integration and weir installation works	● Potential for short periods of closures or limited use of existing rail spur line may be necessary as new and/or temporary rail spur bridge facilities are put in place.
Impact to pedestrian movement	● Existing pedestrian activity in the area is located on Cherry Street and on the Lower Don River trail system situated on the north side of Lake Shore Boulevard through the Keating Channel Precinct, including a Don River crossing. Pedestrians using these pathways will be impacted during construction. Refer to the "Impact to Cyclist Movements" section below for details. ● Any pedestrian travel will be restricted at times through the Keating Channel Precinct and along the Lake Shore Boulevard corridor between Cherry Street and Logan Avenue and along Cherry Street through the Gardiner area during construction – particularly during demolition of the elevated expressway.	● It is recommended that the path link to the Lower Don River trail system be temporarily relocated during construction when new works conflict with the current location. This will require that some segments of the path be shifted north of the new DVP ramps. ● It is recommended that the path connecting to the east be temporarily established along the proposed Villiers Street and/or Commissioners Street detour route. This will divert pathway users south on Cherry Street to Villiers Street and/or Commissioners Street to reconnect with the pathway via Don Roadway north to Lake Shore Boulevard. ● Appropriate signage will be implemented to identify detour routes at the time of temporary roadway/sidewalk closures. In addition, closure events and restricted access will be minimized to the greatest extent possible to facilitate pedestrian movement during construction.	● Some short periods of closures to existing pathways may be necessary as new, temporary pathway facilities are put in place. ● The establishment of temporary pathways through the area may increase the trip length which could be a negative impact to commuters.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
Impact to cyclist movement	• No impacts to the Martin Goodman Trail have been identified. • The path connecting to the Lower Don River trail system is currently situated north of Lake Shore Boulevard through the Keating Channel Precinct and a branch off of this provides path access across the Don River (via a separate bridge crossing) to run along the north side of Lake Shore Boulevard. Both of these links will be impacted by the proposed works as they are situated where new facilities will be located. • Cyclist travel along Cherry Street could be impacted by construction – particularly during demolition of the elevated expressway.	• It is recommended that the path link to the Lower Don River trail system be temporarily relocated during construction when new works conflict with the current location. This will require that some segments of the path be shifted north of the new DVP ramps. • It is recommended that the path connecting to the east be temporarily established along the proposed Villiers Street and/or Commissioners Street detour route. This will divert pathway users south on Cherry Street to Villiers Street and/or Commissioners Street to reconnect with the pathway via Don Roadway north to Lake Shore Boulevard. • Appropriate signage shall be implemented to identify detour routes at the time of temporary pathway closures. In addition, closure events and restricted access will be minimized to the greatest extent possible to facilitate cyclist movement during construction.	• Some short periods of closures to existing pathways may be necessary as new, temporary pathway facilities are put in place. • The establishment of temporary pathways through the area may increase the trip length which could be a negative impact to commuters.
PUBLIC SAFETY			
Safety risks to pedestrians	• Pedestrians will be required to use temporary facilities during the construction period, including those that are on-road rather than the current off-road pathways. • Pedestrians could be at risk from the movement of construction related vehicles and equipment on public roadways.	• Temporary pathway facilities will be designed to address safety issues (e.g., appropriate path widths, barriers to separate cyclist/pedestrians from vehicle traffic). • Construction staging will minimize overall impacts to motorists, residents and trail/pathway users. • Appropriate signage and public communication shall be implemented to identify detour routes at the time of temporary roadway/pathway/sidewalk closures. • Closure events of roadways and pathways will be minimized to the greatest extent possible to facilitate vehicle, cyclist and pedestrian movement through the area during construction.	• Through appropriate mitigation, safety risks to pedestrians are expected to be largely avoided.
Safety risks to cyclists	• Cyclists will be required to use temporary facilities during the construction period, including those that are on-road rather than the current off-road trails. • Cyclists could be at risk from the movement of construction related vehicles and equipment on public roadways.		• Through appropriate mitigation, safety risks to cyclists are expected to be largely avoided.
Safety risks to motorists	• Motorists could be at risk from the movement of construction related vehicles and equipment on public roadways. • Motorists will be initially unfamiliar with detour roads which could include some unconventional road configurations.		• Through appropriate mitigation, safety risks to auto users are expected to be largely avoided.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
PLANNING AND URBAN DESIGN			
Impact with other projects and initiatives	• The current Gardiner construction period is forecasted to be 2020 to 2026. • There are many other projects proposed in the study area (both public and private) that could proceed to construction at the same time that the Gardiner project is to be constructed including for example the DMNP, Cherry Street realignment, Metrolinx Regional Express Rail Program/rail bridge track expansion and the First Gulf Development. • The project has the potential for impact on the implementation of these other projects should the construction periods overlap. • There is the potential for cumulative effects on the surrounding community for several projects being constructed at the same time.	• Many of the other projects/plans are in the control of the project co-proponents. • Assess the potential for project overlaps (time and space) to determine potential conflicts and/or the potential to re-package infrastructure works to improve coordination amongst projects and eliminate issues. • Project co-proponents and/or its agent(s) to coordinate with City Transportation Services. • City and/or its agent(s) is required to apply for permit(s) to coordinate planned lane, pathway and roadway closures to manage impacts to a host of users, including pedestrians, cyclists, transit, and motor vehicles. • Liaise with transit, police, and other Emergency Services, and provide feedback and guidance to contractors. The project co-proponents and/or its agent(s) are responsible for notifying impacted residents and businesses. • Project co-proponents and/or its agent(s) will communicate with the implementing/review agencies of other projects such as TRCA and Metrolinx to ensure that the Gardiner East Project construction activities are coordinated with the other projects in the area. • Refinement of the construction staging plan will be required to address coordination of simultaneous construction projects in the study area if timelines for the implementation of major projects coincide.	• With proper coordination and management of the numerous area construction projects, the net negative effects should be minimal.
Change in views and viewscapes	• Construction activities will be visible through the project area. Some may feel that this is a negative effect despite the current vacant land/former industrial nature of the study area (Keating Channel Precinct).	• No mitigation required.	• Minor temporary changes in views during the construction period.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
SOCIAL AND HELATH			
Effects from contaminated soil disturbance	• Much of the project area contains soils that are contaminated (oil impregnated). • The nature and extent of the contamination is to be confirmed in advance of or during detailed design. • Potential for short-term truck traffic related nuisance effects in the local area from the transportation of contaminated soil off-site for disposal (noise and air emissions). • Related truck traffic could result in additional traffic congestion in the local area.	• Soils and groundwater will be managed as per applicable MOECC requirements and the contaminated soil disposed of off-site at a licensed disposal facility. Collected groundwater may require treatment prior to discharge. • Project co-proponents and/or its agents will be required to develop a comprehensive materials and groundwater management plan including the identification of intended haulage routes for the removal of materials and to submit the plan for approval. Haulage routes will be restricted to appropriate roads to minimize local area impacts. Any collected ground water collection and treatment requirements will be identified. • A provincial Permit to Take Water may be required if the extent of pumping is above 50,000 litres of water per day, which is expected. This will result in the pumping and potential ground water effects coming under MOECC review and approval requirements.	• With appropriate mitigation, no adverse effects from contaminated soil disturbances are expected.
Effects from contaminated groundwater	• Any underground works (e.g., new Gardiner/ramp footings, storm sewers) will likely be in the groundwater zone as groundwater in the Keating Channel Precinct area has been reported as being between 1.5 m and 2.5 m below surface and fluctuating very little throughout the year. Such works will likely need to pump ground water to keep the excavations dry while the underground works are installed/constructed. • There is the potential that the groundwater encountered is contaminated (with PHCs, PAHs and inorganic substances).		• With appropriate mitigation, no adverse effects from contaminated groundwater disturbances are expected.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
Change in air quality	• The set-up and use of on-site construction facilities such as concrete batch plants and the operation of construction equipment will result in air emission from use of internal combustion engines. • Excavation of soils could result in an increase in dust/particulate matter in the local area. • Between Cherry Street and the Don River, the area is undeveloped. The closest receptors are located to north of the Metrolinx rail corridor (West Don Lands). The closest sensitive receptors are about 300 m away. • Between the Don Roadway and Logan Avenue there are a few commercial (warehouse) businesses in proximity to the corridor that could experience some air quality effects during removal of the Logan Ramps/rebuild of Lake Shore Boulevard.	• The introduction of on-site construction facilities such as batch plants potentially have the effect of reducing truck traffic on area roads by keeping the external delivery of materials such as concrete to a minimum. • Air emissions from any construction point sources such as batch plants may require an Environmental Compliance Approval from the MOECC and subsequent monitoring. • Apply water and dust suppressants during construction to protect air quality due to dust. • (Contractors are required to keep idling of construction equipment to a minimum and maintain equipment in good working order to reduce emissions from the construction activities.	• Temporary and localized air quality effects are anticipated (e.g., dust). • Effects will be minimal as receptors are generally well removed from the project location.
Change in noise levels	• Pile driving activities, bridge deck and bent removal and the operation of construction equipment will result in noise generation. • Between Cherry Street and the Don River, the area is undeveloped. The closest receptors are located to north of the Metrolinx rail corridor (West Don Lands). The closest sensitive receptors are about 300 m away. • Between the Don Roadway and Logan Avenue there are a few commercial (warehouse) businesses in proximity to the corridor that could experience some noise disturbance effects during removal of the Logan Ramps/rebuild of Lake Shore Boulevard.	• Contractor operational constraints related to construction noise will be incorporated into the contract documents. • Construction activities throughout the project will conform to current municipal noise by-laws giving due consideration to such factors as the time of day, proximity and size of equipment and type of operation. • Contractors are required to keep idling of construction equipment to a minimum and maintain equipment in good working order to reduce noise from the construction activities.	• Temporary and localized noise effects are anticipated. • Effects will be minimal as receptors are generally well removed from the project location.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
Vibration effects	• Pile driving activities, bridge deck and bent removal and the operation of construction equipment could result in some off-site vibration effects; • Between Cherry Street and the Don River, the area is undeveloped. The closest receptors are located to north of the Metrolinx rail corridor (West Don Lands). The closest sensitive receptors are about 300 m away. • Between the Don Roadway and Logan Avenue there are a few commercial (warehouse) businesses in proximity to the corridor that could experience some vibration disturbance effects during removal of the Logan Ramps/rebuild of Lake Shore Boulevard (major buildings are 40 to 70 m away).	• No specific vibration mitigation required.	• Minimal vibration effects are possible during some construction activities (e.g., pile driving, if required) • As buildings are generally well removed (40 to 70 m) from the project location, this will minimize the effects.
Traffic diversion effects on neighbourhoods	• During construction and periods when traffic detours are in place, traffic diversion into local neighbourhoods is possible as drivers attempt to find less congested routes in/out of the downtown area. • This traffic diversion, that is expected to be temporary, could result in some increased traffic disturbance effects.	• Appropriate signage shall be implemented to identify appropriate detour routes during construction. • Traffic infiltration monitoring undertaken as required by the project co-proponents. • Traffic turn restrictions may be put in place to limit traffic infiltration into neighbours if identified as a problem.	• Any traffic infiltration effects will be temporary. • With appropriate mitigation and monitoring, traffic infiltration effects into local neighbourhoods can be managed.
Impacts on recreation use	• During construction, use of existing paths through the Keating Channel Precinct will be restricted and/or construction activity could result in noise/air quality effects to users of the path.	• Temporary pathways will be put in place for use by cyclists/pedestrians during periods when construction disrupts existing pathways in the area. • Appropriate signage shall be implemented to identify detour routes at the time of temporary roadway/sidewalk closures. In addition, closure events and restricted access to local residents and/or businesses shall be minimized to the greatest extent possible to facilitate cyclist and pedestrian movement during construction.	• Potential for some temporary disruption to trail users from noise/dust and temporary trail closures.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
NATURAL ENVIRONMENT			
Loss of terrestrial features & habitat	• The realignment of Lake Shore Boulevard and the expressway connection east of Cherry Street will result in the removal of approximately 2.5 ha of low quality vegetation that consists primarily of urban species and non-native invasive species that are regenerating in former industrial properties. • Effects to area vegetation and terrestrial habitat are documented in the Keating Channel Precinct Environmental Study Report. The redevelopment of the Keating Channel Precinct is expected to result in the loss of this same low quality vegetation. • Urban wildlife that inhabits these areas would be expected to relocate (e.g., birds, raccoons, coyotes, squirrels). Potentially into the Don Valley system that is nearby.	• A special provision in the Contract will include provisions to protect wildlife encountered during construction. • Salvage plants for replanting were appropriate. • Creation of new green space along north side of the realigned Gardiner-Lake Shore Boulevard as per the public realm concept for the undertaking will result in the creation of new habitat. • Co-proponents will integrate with the Port Lands Biodiversity Strategy that is currently being developed (part of the Port Lands Framework Plan), which includes components to develop and protect wildlife corridors through the development of the Port Lands.	• Loss of approximately 2.5 ha of poor quality vegetation. • The net impact is considered to be low considering the low amount of terrestrial habitat to be removed and the low quality of this habitat.
Disruption to terrestrial features & habitat	• There is no valued terrestrial habitat in the immediate vicinity of the project that is expected to be affected by the project.	• No specific mitigation required other than implementation of standard construction best management practices (BMPs) to minimize off site disturbance effects.	• Low potential for disruption to terrestrial habitat due to a lack of habitat in the vicinity of the project.
Loss of aquatic features & habitat	• The construction of the following new facilities have the potential for loss of aquatic habitat: ○ Construction of new DVP-Gardiner ramp columns in the Don River. Two new columns are to be constructed in the river with a diameter of approximately 1.5m each. To minimize construction impacts it is recommended that these columns be extended to bedrock (approximately 10 m below ground level) eliminating the need to construct a local footing for each column in the river. Such column/caisson construction will require in-river works with a slightly larger footprint than the column, approximately 3.0 m diameter, with installation/drilling likely from a barge. This will result in a construction disruption foot print of about 7m^2 per column, or a total habitat disruption area of 14.0 m^2 during construction. There will be a net gain of permanent habitat of approximately 8 m^2 as a result of the new columns being smaller than the existing ones;	• Apply stormwater run-off BMPs. • Prepare and follow a spills response plan for construction activity in proximity to open water areas. • The construction contract will include special provisions related specifically to fish and fish habitat (Timing of In-Water Work and Additional Measures to Avoid Serious Harm to Fish under the Fisheries Act). This will also require coordination with TRCA. • To protect sensitive life stages/processes of migratory and resident fish, in water work will be conducted between July 1st to March 31st. • Fish screens shall be used on all dewatering intake pipes to protect fish, if required.	• Permanent destruction of 4 m^2 of low quality aquatic habitat (the existing columns impact approximately 12 m^2). There will be a net gain of permanent habitat of approximately 8 m^2 as a result of the new columns being smaller than the existing ones which will be removed.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
	○ Lake Shore Boulevard – Don River bridge widening (and raising if possible) (note that work and impacts associated with the proposed Lake Shore Boulevard bridge over the Don River are documented in previous EA reports for the Lower Don Lands Master Plan, Keating Channel Precinct Environmental Study Report and the Don Mouth Naturalization and Port Lands Flood Protection Project). ● The removal of the east end of the Gardiner deck and columns (i.e., "Logan Ramps") will not result in any loss of aquatic features or habitat as the east end of the Gardiner is located directly over Lake Shore Boulevard in the Don River crossing area and the support columns are integrated with the columns supporting Lake Shore Boulevard. As with the demolition of the DVP–Gardiner ramps columns, appropriate demolition procedures are required to minimize the loss of aquatic habitat.	● Consult with Aquatic Habitat Toronto to identify permitting requirements, assess monitoring needs and develop offsetting plan.	
Disruption to aquatic features & habitat	● The following construction activities have the potential for disruption to aquatic habitat: ○ Demolition the existing DVP ramps and Gardiner bridge decks of the Don River and the elevated expressway along the north side of the Keating Channel; ○ Demolition of the existing DVP–Gardiner ramp columns/piers in the Don River; ○ Construction of new DVP–Gardiner ramp columns in the Don River; ○ Placement of a temporary bridge across the Keating Channel to accommodate a temporary detour road; ○ Widening/reconstruction of the Lake Shore Boulevard – Don River bridge (note that Work and impacts associated with the proposed Lake Shore Boulevard bridge over the Don River are documented in previous EA reports for the Lower Don Lands Master Plan, Keating Channel Precinct Environmental Study Report and the Don Mouth Naturalization and Port Lands Flood Protection Project). ● Aquatic habitat quality in the Don Mouth area and Keating Channel is considered to be poor. ● From the above construction activities, there is potential for temporary disturbance to aquatic species and habitat in the Don	● Consult with Aquatic Habitat Toronto to identify permitting requirements and mitigation strategy (to include Don River and Keating Channel). ● Apply stormwater run–off BMPs as outlined below for "Change in surface water quality from storm run–off". ● All disturbed areas will be stabilized with rock or topsoil and seed/mulch to prevent future erosion ● Appropriate erosion and sediment control measures (e.g., silt fencing) must be installed along exposed surfaces around the work area to prevent sediment–laden runoff from entering the surrounding water body. ● Erosion and scour control material to be placed on the existing banks (not on the creek bed) under the bridges will be free of fines and placed gently in calm weather so as to not create sediment plumes. ● Erosion and sediment control measures will be left in place until all exposed soils have been stabilized. ● Handling of fuel, excess materials and debris will be	● Temporary disruption of aquatic habitat in Don River mouth and Keating Channel. ● The effect will be of short duration, localized and minimized through the identified BMPs/mitigation measures.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
	Mouth and Keating Channel during construction from run-off and sedimentation effects, spills and from demolition debris falling into the river.	properly managed on-site and removed as per the standard construction practices necessary to protect the water body. ● All materials used or generated (e.g., organics, soils, woody debris, temporary stockpiles, construction debris, etc.) will be temporarily stored, handled and disposed of during site preparation, construction and clean-up in a manner that prevents entry into the water body. ● Minimize demolition debris from entering the water.	
Change in surface water quality from storm run-off	● During construction, particular during period when soil is excavated or exposed, there is the potential for run-off effects into local water bodies including the mouth of the Don River and the Keating Channel.	● Develop and implement an erosion and sediment control (ESC) plan to mitigate impacts to the Don River and Keating Channel, and associated riparian habitat. These measures should contain the construction area. ● ESC measures will be monitored regularly and/or after every 10 mm or greater rainfall event as they could require periodic cleaning, maintenance and/or re-construction. If deficiencies are found, they will be repaired and/or replaced promptly. ● Grading, placement of topsoil and seeding specifications to be implemented to decrease the erosion potential and promote suitable native vegetation regeneration. ● Construction sites will be stabilized prior to removal of erosion and sediment control measures. ● If works require dewatering, then a dewatering plan will be prepared in accordance with environmental best management practices. ● A construction work plan will be developed which designates locations for stockpiling of soils and other materials including fuel. Prior to commencement of construction, the limits of protection areas will be delineated and fenced to avoid inadvertent intrusion of machinery or other activities such as stockpiling of excess material.	● With the implementation of the mitigation measures, adverse effects to surface water quality during construction will be minimal. ● Any effects will be temporary, short duration and localized.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
		This fencing should be maintained and remain in place until final grading and landscaping has been completed. ● After major storm events, monitor effectiveness of mitigation measures. Implement corrective action measures if there is visible evidence of sedimentation in receiving water bodies (Don River/Keating Channel).	
Impact on Don River flood conveyance	● The placement of construction forms, supports etc. in the Don River floodplain could impact flood water conveyance during major storm/flood events. ● This would be a temporary condition. ● Effects might occur if there is a major storm event while construction forms/supports etc. are in the floodplain.	● The work area(s) shall be stabilized against the impacts of high flow events at the end of each workday. ● Undertake construction under normal weather conditions, to the extent possible, and design project to appropriate specifications to withstand variable weather conditions. ● Project co-proponents to consult with TRCA to coordinate construction of project with the construction and operation of the sediment management area as part of the DMNP. ● Project co-proponents to coordinate with TRCA to minimize the period in which construction impacts to flood conveyance may be felt. Additional hydraulic modelling will likely be required to test construction staging approaches in detailed design. Hydraulic modelling will be managed through TRCA. ● Monitor effectiveness of flood conveyance during storm/flood events should they occur. ● Removal of existing Gardiner support piers as part of the demolition activities may contribute to improved flood conveyance.	● Some impact on flood conveyance is possible during the construction period but can be minimized through appropriate design specifications. ● Impacts on flood water conveyance will be temporary.
Potential for change to microclimate/ heat island effect	● Not applicable to the construction period.		

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
Ability to accommodate storm event changes from climate change	• Adequate storm controls will be put in place during construction as previously described for "Change in surface water quality from storm run-off". • As construction is to occur in the near term and will be temporary, significant changes in storm events as a result of climate change are not anticipated.	• The ability of the stormwater controls to accommodate storm events will be monitored. • In the event that climate change results in different storm characteristics, changes will be made to the storm control system.	• No net adverse effects as a result of climate change with appropriate controls and monitoring in place.
CULTURAL RESOURCES			
Removal of built heritage features	• No built heritage features will be removed by the project.		
Change to cultural landscape	• No cultural landscapes are impacted.		
Impact on archaeological resources	• The project is largely located on areas of historical lakefill that have been subject to extensive past historical development activity. • Based on the completed Stage 1 Archaeological Assessment, because of the historical development activities in the area, there is no potential for the survival of Aboriginal archaeological resources in primary contexts. • Potential for impact on nineteenth-early twentieth century development features including Toronto Dry Docks, Toronto Iron works and British American Oil.	• Prior to construction, once detailed design has been completed which will finalize project component location (e.g., location of support piers), complete archaeological investigations on areas of excavation required for the project. • Should deeply buried archaeological resources be uncovered, the co-proponents and/or its agent(s) shall immediately notify MTCS. The *Ontario Cemeteries Act* applies to discovery of unmarked human remains.	• With the completion of additional archaeological investigations, adverse effects on any remaining archaeological features are not anticipated.
Impact on First Nations people and activities	• Impacts of First Nations people are not anticipated. The project area is not known to be used by Aboriginal communities for traditional activities. Due to historical land use activities, the potential to encounter intact Aboriginal artefacts is virtually nil. Consultation with interested First Nations groups is on-going.	• Additional First Nations mitigation activities to be determined.	• No net adverse effects on First Nations people or activities anticipated. • Continue consultations with First Nations that have an interest in the project.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
ECONOMICS			
Impacts to goods movement	• Significant portions of the project can be constructed with impacts to existing road traffic • Sections of expressway and surface roads will require shut down during periods of project construction (e.g., to remove overhead infrastructure and to connect the new ramps to DVP lanes). • This is expected to include sections of the Gardiner, Don Roadway and Lake Shore Boulevard. • It is expected that some truck travel time delays will occur during these periods.	• Local commercial entities that rely on truck traffic will receive advance notice of road closure/detour periods. • Truck traffic will be detoured onto existing roadways and constructed detour roads during these periods. Construction Phasing Plan outlines proposed detour roads which are to be finalized during detailed design. • Traffic detouring to be coordinated with other projects that might be under construction during the same period such as the DMNP Project. • The construction phasing plan proposes the need for and location of detour roads.	• Delays to truck traffic movement will be temporary and minimized as much as possible • Provision of detour roads will minimize the effect.
Impact on downtown mobility	• During periods of road closures/detours, access the downtown by vehicle will take longer and be more inconvenient. • This might dissuade some people from coming to the downtown area.	• Advance notifications of road closure periods and road detour and transit options will be made well in advance through various forms of media. • Traffic will be detoured onto existing roadways and constructed detour roads during these periods. Construction phasing plan outlines proposed detour roads which are to be finalized during detailed design. • The construction phasing plan proposes the need for and location of detour roads. • Transit will remain as an option to access the downtown and enhanced transit service may be warranted for periods of time when there are significant road closures. The project co-proponents to work with transit agencies such as GO Transit/Metrolinx. It is noted that GO Transit usage increased during periods of recent lane closures of the Gardiner West.	• Delays to traffic movement will be temporary and minimized as much as possible. • Transit options to access the downtown will be available and possibly enhanced. • Provision of detour roads will minimize the effect.

Assessment Criteria	Construction Period Effects	Mitigation and Monitoring	Net Effects
Impact on local business activity	• During the removal of the Logan Ramps, access along Lake Shore Boulevard could be reduced at times which could affect a few local businesses that are located east of the Don River. • Air quality (dust), noise and vibration effects could result to businesses (2 or 3) located along the Lake Shore Boulevard corridor east of the Don Roadway and to the car dealership located on the east side of the DVP, north of the rail corridor. • Construction of Lake Shore Boulevard–Don River bridge and associated rail spur bridge may result in impacts to rail operations that serve local port operations and Toronto Water Ashbridges Bay Treatment Plant.	• Access to area businesses will be maintained during construction. • Businesses will be notified well in advance of construction timing and any road closures/access limitations. • Temporary closure of the rail spur Don River crossing will be done in consultation with rail spur users including the Toronto Port Authority and Ashbridges Bay Treatment Plant. • Appropriate construction BMPs will be implemented to minimize dust and noise disturbance effects during construction.	• Any impacts on access and disturbances will be temporary. • Effects are expected to be largely minimized through mitigation.

Table 6.3: Operations Net Effects

Effects Assessment Criteria	Operations Period Effects	Mitigation and Monitoring	Net Effects
TRANSPORTATION			
Impact to auto travel time	• In the AM period, compared to the Do Nothing base condition, the Project will result in longer auto travel times for east to west trips. Traffic modelling projects an increase of 3 minutes during the AM peak hour. • In the PM period, compared to the Do Nothing base condition, the Project will result in travel time increase for trips originating in the downtown and destined to the east (i.e., along Lake Shore Boulevard). • Auto travel time increases are not projected for travel to and from areas north and west of the downtown. • During non-peak travel periods, travel time delay will be less than during the peak period forecasts.	• The co-proponents and transit providers are planning improvements to the City/Regional transit system including for example the Metrolinx RER program and Waterfront Transit Re-Set program. • Existing and enhanced transit provide alternative transportation means into the downtown as an alternative mode of travel. • Pathway system will be enhanced including a new pathway that will run along the north side of Lake Shore Boulevard as far as Jarvis or Yonge Street). This will also provide an alternate mode of travel into the downtown.	• Commuters from/to the east that continue to travel to the downtown by automobile will experience delays in the order of 3 min during peak periods. • It is estimated that about 90% of downtown AM commuters will have delays of less than 2 min with the project in place.
Impact to transit travel	• No impacts to transit operations are projected during the project operations period. • The project might entice some auto users to use the transit system to commute to downtown. • The project is consistent with the Waterfront LRT project and facilitates the possibility to bring LRT into the Keating Channel Precinct should Queens Quay be extended east of Cherry Street.	• No additional specific mitigation proposed.	• No long term negative net effects to transit travel.
Impact to pedestrian movement	• The project provides for new/improved multi-use pathways that will improve pedestrian travel through the study area – in particular the removal of the elevated expressway along the north side of the Keating Channel will facilitate an improved pedestrian promenade through this area. Further the provision of a multi-use pathway east of Cherry Street along the north side of Lake Shore Boulevard will promote pedestrian travel through the corridor.	• No additional specific mitigation proposed.	• No long term negative net effects to pedestrians. • Positive effect through improved/new planned multi-use pathway through the corridor and planned intersection improvements.

Effects Assessment Criteria	Operations Period Effects	Mitigation and Monitoring	Net Effects
Impact to cyclist movement	• The project provides for new/improved multi-use pathways that will improve facilitate cycling through the study area. The provision of a multi-use pathway east of Cherry Street along the north side of Lake Shore Boulevard will promote cyclist travel through the corridor. This facility will link with north-south cycle facilities along Cherry, Sherbourne and Yonge Streets. The existing cycle paths east of Cherry St will be improved and linked with the Don Valley cycle route.	• No additional specific mitigation proposed.	• No long term negative net effects to cyclists. • Positive effect through improved/new planned multi-use pathway through the corridor and planned intersection improvements.
PUBLIC SAFETY			
Safety risks to pedestrians	• Safety risks to pedestrians are reduced as a result of: the removal of sections of the overhead expressway (Logan Ramps) that will improve sight lines, proposed improvements to key Lake Shore Boulevard intersections (e.g., Don Roadway), and the development of an off road multi-use pathway through the corridor. • City has committed to undertake a safety review of the Lake Shore Boulevard/Jarvis Street intersection that could lead to further improvements to this intersection for pedestrians.	• No additional specific mitigation proposed.	• No long term negative net effects to pedestrian safety. • Positive effect through improved/new planned multi-use pathway through the corridor and planned intersection improvements.
Safety risks to cyclists	• Safety risks to cyclists are reduced as a result of: the removal of sections of the overhead expressway (Logan Ramps) that will improve sight lines, proposed improvements to key Lake Shore Boulevard intersections (e.g., Don Roadway), and the development of an off road multi-use pathway through the corridor. • City has committed to undertake a safety review of the Lake Shore Boulevard/Jarvis Street intersection that could lead to further improvements to this intersection for cyclists.	• No additional specific mitigation proposed.	• No long term negative net effects to cyclist safety. • Positive effect through improved/new planned multi-use pathway through the corridor and planned intersection improvements.

Effects Assessment Criteria	Operations Period Effects	Mitigation and Monitoring	Net Effects

Safety risks to motorists	• The proposed Gardiner-DVP ramps are to be developed at a 60 km/hr design speed (speed limit posting of 50 km/hr).
	• The required reduction in vehicle speed from 90 km/hr to 50 km/hr is greater than typical for directional ramps.
		• The following measures are recommended for further assessment in the detailed design phase of the project:
		  ○ Provision of appropriate signage;
		  ○ Lowering posted speed on approach mainline (with visual clues);
		  ○ Implementation of crash attenuators;
		  ○ Provision of flatter vertical curves to improve sight lines;
		  ○ Provision of end of queue detection systems in areas with potential ramp queuing;
		  ○ Further shoulder widening on the DVP-Gardiner ramps;
		  ○ Investigation for increasing the length of speed change lanes on the Don Valley Parkway and on the Gardiner associated with the proposed ramps.
			• With the implementation of appropriate safety measures into the design of the freeway facility, safety risks to motorists are expected to be minimized to acceptable levels.

PLANNING AND URBAN DESIGN			
Consistency with secondary/ precinct plans	• The project is consistent with the Keating Channel Precinct Plan. • The relocation of the Gardiner-DVP ramps north of the current alignment allows for a development plan with direct connection to the Keating Channel. • The project co-proponents will review and update the Keating Channel Precinct Plan to reflect the new northern alignment for the Gardiner-DVP ramps. • Redevelopment in the Keating Channel Precinct is to occur after construction of the project is complete.	• No mitigation warranted.	• No net negative effects, as construction is to occur in advance of redevelopment in the Keating Channel Precinct.
Consistency/impact with other projects and initiatives	• Once operational the project is not expected to have negative impacts on other projects in the area.	• No mitigation warranted.	• No adverse effects on other projects.

Effects Assessment Criteria	Operations Period Effects	Mitigation and Monitoring	Net Effects
Change in views and viewscapes	• The relocation of the Gardiner-DVP ramps further north will lead to improvements of views over the Don River mouth and along the Keating Channel. • Improvements to the Lake Shore Boulevard streetscape and public spaces in the corridor will lead to improvements in the viewscape.	• No mitigation warranted.	• No adverse effects on views and viewscapes. • Project will result in improvements to views and viewscapes along the north edge of the Keating Channel and over the Don River mouth, particularly in combination of the planned DMNP Project. • Removal of the Logan ramps will improve views across Lake Shore Boulevard and complement development plans for the First Gulf site that is located north of the Logan Ramps/east of the Don River.
SOCIAL AND HELATH			
Effects from contaminated soil disturbance	• No interaction with contaminated soil during operations.	• No mitigation warranted.	• No adverse effects pertaining to contaminated soil;
Effects from contaminated groundwater	• No interaction with contaminated groundwater during operations.	• No mitigation warranted.	• No adverse effects pertaining to contaminated groundwater.
Change in air quality	• The future volume of traffic within the corridor with the project in place is forecasted to be similar to the base case Maintain (Do Nothing). • As a result, no additional air quality effects are anticipated as compared to the future base case scenario.	• No mitigation warranted.	• No additional long term adverse effects on air quality.
Change in noise levels	• The future volume of traffic within the corridor with the Project in place is forecasted to be similar to the base case Maintain (Do Nothing). • Future development plans for the Keating Channel Precinct and areas east of the Don River will be finalized to reflect new alignment/configuration of the expressway. • As a result, no additional noise effects are anticipated as compared to the future base case scenario.	• No mitigation warranted.	• No additional long term adverse noise effects. • Relocation of expressway away from the Keating Channel will be positive for the Villiers Island development from reduced roadway noise levels.

Effects Assessment Criteria	Operations Period Effects	Mitigation and Monitoring	Net Effects
Vibration effects	● The future volume of traffic within the corridor with the Project in place is forecasted to be similar to the base case Maintain (Do Nothing). ● Future development plans for the Keating Channel Precinct and areas east of the Don River will be finalized to reflect new alignment/configuration of the expressway. ● As a result, no additional vibration effects are anticipated as compared to the future base case scenario.	● No mitigation warranted.	● No adverse effects pertaining to vibration.
Traffic diversion effects on neighbourhoods	● Once operational, the facility is not expected to result in any additional traffic infiltration into local neighbourhoods.	● No mitigation warranted other than routine traffic pattern monitoring by City Transportation.	● No adverse effects pertaining to traffic infiltration.
Impacts on recreation use	● The project, through the development of a new multi-use path along Lake Shore Boulevard will benefit recreation opportunities.	● No additional mitigation warranted.	● No adverse impacts on recreation use. ● New multi-use path will lead to positive effects. ● Project will enhance opportunity to develop a waterfront promenade along the north edge of the Keating Channel which provides a new recreation experience in the local area.
NATURAL ENVIRONMENT			
Loss of terrestrial features & habitat	● No loss of terrestrial habitat during operations. ● The project, through proposed landscaping along the Lake Shore Boulevard will result in an increase of the tree canopy.	● No specific mitigation warranted.	● No adverse effect on terrestrial features during operations. ● The project will result in a positive effect through proposed landscaping along the Lake Shore Boulevard.
Disruption to terrestrial features & habitat	● No additional disruption to habitat during operations.	● Monitor health of trees once planted along the corridor.	● No adverse effects to terrestrial habitat.
Loss of aquatic features & habitat	● No loss of aquatic habitat during operations.	● No specific mitigation warranted.	● No adverse effect on aquatic features during operations. ● The project will result in a positive effect through relocated of the expressway from the Keating Channel allow for further opportunities of shoreline/aquatic habitat enhancement.
Disruption to aquatic features & habitat	● With improved storm control systems in place, and relocation of expressway away from the Keating Channel, less effect to water quality/aquatic habitat are expected.		

Effects Assessment Criteria	Operations Period Effects	Mitigation and Monitoring	Net Effects
Change in surface water quality from storm run-off	• The removal of the elevated expressway and Lake Shore Boulevard away from the north edge of the Keating channel is expected to contribute to improved water quality in the channel. • As well, the new infrastructure provides the opportunity to install improved storm collection and treatment prior to discharge.	• No additional mitigation warranted beyond storm water management system that is to be put in place.	• No additional adverse effects to water quality in local water bodies. • Potential for improvement to water quality in local water bodies.
Impact on Don River flood conveyance	• The new ramp location and height over the Don River has been designed to meet TRCA flood conveyance requirements and sediment and debris management operations.	• Complete final design for the ramps in consultation with the TRCA to meet flood conveyance and sediment and debris management requirements.	• No additional adverse effects to flood conveyance.
Potential for change to microclimate/ heat island effect	• The project is expected to result in a similar, if not less amount, of impervious paved areas that would contribute to an urban heat island effect considering the removal of the Logan Ramps. • The proposed landscape plan, including the planting of street trees along the corridor would provide additional shading reducing heat island effects.	• No additional mitigation warranted beyond the landscape/public realm plan that is proposed by the co-proponents including the proposed extensive canopy of street trees along the rebuilt sections of Lake Shore Boulevard (approximately east of future Munition Street intersection).	• No net negative effects. Potential for positive effects as a result of the commitment for corridor plantings and removal of Logan Ramps.
Ability to accommodate storm event changes from climate change	• The design of the elevated expressway will include opportunities to allow more water to drain from the elevated surfaces (deck drains) to accommodate storm events (greater rainfall and intensities). Storm sewers would still be sized for the 2 year storm but the deck drains would allow for greater opportunity for surface drainage from the major system storm.	• Complete final design of the Gardiner deck drains to ensure that storm events can be accommodated/managed.	• No net negative effects. The reconstructed section of the elevated Gardiner between Cherry Street and the DVP will have less elevated surface than the existing structure and will provide improved drainage to manage storm events.
CULTURAL RESOURCES			
Removal of built heritage features	• No impacts during operations period.	• Not required;	• No impacts during operations period.
Change to cultural landscape	• No impacts during operations period.	• Not required;	• No impacts during operations period.
Impact on archaeological resources	• No impacts during operations period.	• Not required;	• No impacts during operations period.
Impact on First Nation People and activities	• Impacts on First Nations people are not anticipated. The project area is not known to be used by Aboriginal communities for traditional activities. Consultation with interested First Nations groups is on-going.	• Continue consultations with First Nations that have an interest in the project.	• No net adverse effects on First Nations people or activities anticipated.

Effects Assessment Criteria	Operations Period Effects	Mitigation and Monitoring	Net Effects
ECONOMICS			
Impacts to goods movement	● In the AM period, compared to the Do Nothing base condition, the Project will result in longer auto travel times for east to west trips. Traffic modelling projects an increase of 3 minutes during the AM peak hour. ● In the PM period, compared to the Do Nothing base condition, the Project will result in travel time increase for trips originating in the downtown and destined to the east. ● Travel times for truck trips originating/destined from the Waterfront/Port Lands area are not expected to be significantly affected with the provision of new Gardiner access ramps located east of Cherry Street. ● Truck travel time increases are not projected for travel to and from areas north and west of the downtown.	● No specific mitigation recommended. ● City Transportation to work with those entities involved with Goods Movement to ensure that adequate access to road network is provided.	● Based on the forecasted future travel times, impacts to the movement of goods in the project area are expected to be minimal and well within variation of typical travel times.
Impact on downtown mobility	● No negative impact on downtown mobility once the facility is constructed and operational.	● No specific mitigation recommended. ● Improve future transit system expected to improve downtown mobility.	● Effects on downtown mobility expected to be minimal.
Impact on local business activity	● Access to businesses to be maintained. ● No long-term negative impacts to businesses are anticipated.	● No specific mitigation warranted.	● No long-term negative impacts to businesses are anticipated.

6.3.2.1 Transportation

Construction Period

During the construction period, the main potential effects relate to delays to road traffic as a result of temporary roadway closures and impacts to pedestrians and cyclists due to temporary closures of the existing pathway through the Keating Channel Precinct as well as the pathway along the north side of Lake Shore Boulevard east of the Don River.

Through the Keating Channel Precinct, much of the new roadway infrastructure can be constructed without impact to road traffic. However, for the connection of the ramps to the DVP, the demolition of the existing elevated expressway including the Logan Ramps, and for the connection of the new elevated section to the remaining section of the Gardiner at Cherry Street, road detouring will be required. An initial road detour plan has been developed as presented in the project description above (also see **Appendix D, Construction Staging Report**). This is an example detour plan. More detailed construction staging planning, including the location of road detours, will need to be developed in concert with the detailed design of the undertaking. Despite the best efforts to detour traffic, delays to road traffic will occur, particularly during the AM and PM peak commuting periods. Other roads including surface streets such as Richmond Street/Adelaide Street can expect increased traffic volumes during road closure periods. The project co-proponents will widely communicate road closure/detour periods and encourage commuters to use public transit or travel during off-peak periods as much as possible. The City and/or its agent(s) will monitor traffic conditions and make adjustments to the traffic management plan accordingly.

Similarly, users of the existing pedestrian/cyclist connections located on Cherry Street, on the Lower Don River trail system situated on the north side of Lake Shore Boulevard through the Keating Channel Precinct, including the Don River crossing, will be affected. Sections of these pathways will require closure at periods (e.g., demolition) to ensure that the public is not at risk. To mitigate these effects, it is recommended that a temporary path through the Keating Channel Precinct to the Lower Don River trail system be created that runs outside of the construction area (i.e., run close to the rail corridor).

It is also recommended that the multi-use pathway connecting to the east (that includes a Don River crossing) be temporarily established along the proposed Villiers Street and/or Commissioners Street detour route. (Note that this detour route needs to be confirmed during the refinement of the construction staging plan.) This will divert pathway users south on Cherry Street to Commissioners and/or Villiers Street to reconnect with the pathway via Don Roadway

north to Lake Shore Boulevard. These pathway detours will increase the length of the trip for cyclists and as a result, a decrease in their usage is possible, although auto traffic delays as a result of road closures may make cycling an attractive alternative.

Section 6.5 of this report includes consideration for cumulative effects. Due to the number of redevelopment projects being planned in and adjacent to the study area, a review of cumulative effects considers the coordination of traffic management during construction as it relates to the various projects that the co-proponents are undertaking.

Operations Period

The removal of the Logan Ramps will add travel time to those travelling to/from the east (i.e., south Scarborough and the Beach communities that regularly use Lake Shore Boulevard). Travel to/from the north and the west will not be affected. Traffic modelling forecasts that travel time in the AM peak hour will increase by about three minutes over future baseline conditions. Planned transit improvements such as the Metrolinx RER program and the subway relief line will provide alternatives for commuters. It is noted that even under the future Do Nothing condition, auto travel times will increase as a result of growth in background traffic volumes due to population and employment increases in the city, including in the Port Lands area.

Access between the elevated Gardiner Expressway and Lake Shore Boulevard will be provided through the new Cherry Street ramps in the Keating Channel Precinct.

For pedestrians and cyclists, once fully operational the project would include a continuous multi-use pathway that extends from Jarvis Street east along the north side of Lake Shore Boulevard and connecting to the existing Don Valley trail and the path that exists east of the Don River. With this new multi-use pathway, pedestrian and cycling access through the corridor will be improved over the existing condition.

6.3.2.2 Public Safety

Construction Period

All major infrastructure construction projects present some risk to the public. Construction will be staged to ensure public safety. As an example, access below the elevated expressway sections will be restricted during demolition. Vehicles will be detoured away from the construction areas as per the traffic management plan that is to be developed in greater detail by the project co-proponents and its agent(s). There will be appropriate signage and notifications to ensure that drivers are well aware of the detour plans and timing. Similarly,

pedestrians and cyclists will be diverted off of existing paths through the area onto temporary paths and detour roads. It is also important that worker safety be maintained. Health and safety plans to maintain staff safety on-site during construction will be required prior to the commencement of construction activities.

Operations Period

The project will involve tighter ramp radii (130 m) at a slower design speed that the current ramps that connect the Gardiner with the DVP. As a result, there is the potential for drivers to expect higher Gardiner-DVP ramp speeds than the posted design speed - 90 km/hr speed limit to transition to a 50km/hr speed limit. In developing the alternative designs, Dillon completed a safety assessment of the design alternatives. In addition, an independent safety audit of the Hybrid Alternatives was completed by AECOM. The safety review focused on the ramp geometry connecting the Gardiner and DVP as well as the new ramp connection to the east of Cherry Street that are included in each of the Hybrid alternative designs. Input from this review resulted in some revisions being made to the alternative designs. The following measures are recommended for further assessment in the detailed design phase of the project:

- Provision of appropriate signage;
- Lowering posted speed on approach mainline (with visual clues);
- Implementation of crash attenuators;
- Provision of flatter vertical curves to improve sight lines;
- Provision of end of queue detection systems in areas with potential ramp queuing;
- Further shoulder widening on the Gardiner-DVP ramps; and,
- Investigation for increasing the length of speed change lanes on the DVP and the Gardiner associated with the proposed ramps.

With appropriate mitigation, including signage and speed deceleration zones, the ramps can be designed to an acceptable level of safety.

Once operational with the new off-road multi-use pathway in place, as well as the proposed Lake Shore Boulevard intersection improvements, safety levels for pedestrian and cyclists will be improved over future baseline conditions. In particular, the removal of the Logan ramps will improve sight lines at grade along Lake Shore Boulevard.

6.3.2.3 Planning and Urban Design

Construction Period

The area to be subject to the most change from the project includes the Keating Channel Precinct (Cherry Street to Don Roadway) and the section of Lake Shore Boulevard that extends about 575 m east of the Don Roadway (to Booth Street). The Keating Channel Precinct lands east of Cherry Street consist largely of publicly-owned vacant former industrial lands that are planned for future development as per the Keating Channel Precinct Plan. The precinct is expected to remain vacant during the project construction period and as such there will be no direct impact on planned land use in the immediate area as a result of the undertaking. East of the Don Roadway, the First Gulf property (at 21 Don Roadway) is currently being planned for redevelopment. The timing for this development is unknown and approvals for this site have not yet been obtained. It is not anticipated that the removal of the Logan Ramps/re-build of Lake Shore Boulevard will have direct impact on the First Gulf property development.

The project will require a section of the First Gulf site immediately to the east of the Don Roadway. This land is required to facilitate the tighter radius of the DVP-Gardiner ramps allowing for a more northern alignment through the Keating Channel Precinct. This required area is also proposed for a future flood protection berm which is needed to allow the First Gulf development to proceed. There may be an opportunity to integrate the Don Roadway realignment into the flood protection features which will be determined as part of the detailed design work for the Project. The co-proponents will work with First Gulf and TRCA in the finalization of land requirements and acquisition to support the project.

It is noted that there are other planned projects/developments proposed in the project area that could proceed during the period of time that the Gardiner East Project is to be constructed (2020-2025). In particular, the Lower Don Lands and DMNP Project detailed design and implementation, which is being led by Waterfront Toronto in cooperation with TRCA and the City, will lead to a major transition of the mouth of the Don River, Lower Don Lands, Port Lands and South of Eastern area and has some areas of physical overlap with the Gardiner East Project. Other planned future projects in the project area include the Cherry Street realignment, the Metrolinx RER Program/rail bridge track expansion, the Don River and Central Waterfront Project, the Port Lands and South of Eastern redevelopment, and the First Gulf development. To avoid conflict with the development of these other planned projects, should they proceed to implementation at the same time as the Gardiner East project is being constructed, it will be important for the project co-proponents to collaborate with the agencies/interests that are involved with these other projects. In most cases the project co-proponents are also leading

these other projects and as such coordination within and between Waterfront Toronto and the City will be required to manage construction and implementation.

Operations Period

Once construction is complete and operational, the realignment of the elevated expressway/Lake Shore Boulevard and removal of the Logan Ramps will allow for a major transition to the Keating Channel Precinct as well as to the lands that parallel the north and south sides of the existing Logan ramps. With the realignment of the expressway connection towards the north edge of the Keating Channel Precinct and removal of the Logan Ramps, key achievements of the project include the ability to:

- Develop an unencumbered water's edge promenade along the north edge of the Keating Channel;
- Create a new Keating Channel Precinct community with direct access the water – conceptual plans illustrate that approximately 7.5 acres of public development lands with direct access to the water will be created with an estimated value of $72m-$83M;
- Extend Queens Quay east of Cherry Street allowing for the creation of a pedestrian friendly street;
- Develop Villiers Island well removed from an elevated expressway; and,
- Develop the First Gulf site with connection to a 2-way Lake Shore Boulevard free of overhead ramps/expressway.

Figure 6.8 shows a draft development concept for the Keating Channel Precinct with the project in place. This is to be finalized through a review and update of the Keating Channel Precinct Plan that the project co-proponents will undertake once the MOECC has approved the Gardiner East EA.

Figure 6.8: Preferred Undertaking – Keating Channel Precinct Conceptual Development Concept

6.3.2.4 Social and Health

Construction Period

This criteria is primarily concerned with impacts to residents and users of recreation facilities. The project area is primarily vacant land that is well removed from existing residences, formal recreation features, and institutions (e.g., schools). The closest residences are in the newly created West Don Lands development that is located north of the rail corridor, approximately 200 m away from the new northern alignment of the Gardiner Expressway east of Cherry Street. There are no institutional uses in close proximity to the project that might be affected. Planned facilities (e.g., on Villiers Island) would not likely be constructed and operating during the Gardiner East project construction period. There is the potential for typical construction disruption effects including noise, dust and vibration. A construction management plan will be developed by the constructor to minimize these effects. Due to the absence of social features in proximity to the project location and the ability to mitigate effects, adverse effects to residents and institutions are not expected.

During periods of road closures, there is potential for traffic patterns to change, particularly during peak travel periods as drivers look for faster routes to the downtown. This could result in additional traffic infiltration into residential neighbourhoods. The South Riverdale/ Riverside community is potentially susceptible to this. During road closure/detour periods, the City will need to monitor traffic patterns and potentially implement measures such as turn restrictions to minimize effects to local neighbourhoods.

Users of the existing pathway linking the Martin Goodman Trail to the Don Valley Trail and the pathway (Lower Don Recreation Trail) that runs along the north side of Lake Shore Boulevard east of the Don Roadway will experience some effects, including nuisance effects, trail closures and longer required travel distances through provided detours. These effects are previously described under the Transportation criteria group.

The only other recreation feature of note that could be affected is McCleary Park that is situated on the south side of Lake Shore Boulevard where the Logan Ramps touch down. There are two baseball diamonds at this Park. Users of this park could experience nuisance type effects (noise/dust) and could face access restrictions, although alternative access to this park is possible via Commissioners and Bouchette Streets.

Operations Period

Once operational, the project is expected to not result in any greater effects as compared to the Do Nothing under future baseline conditions. Road traffic is a major contributor to noise and air quality in the project area and the proposed project is not expected to result in a material change to traffic volumes or patterns in the area. The Keating Channel Precinct will be developed, and residential building located in recognition of the new realigned expressway and Lake Shore Boulevard.

6.3.2.5 Natural Environment

Construction Period

Natural habitat in the area of project construction is either non-existent or severely degraded. The realignment of Lake Shore Boulevard and the expressway connection east of Cherry Street will result in the removal of about 2.5 ha low quality vegetation that consist primarily of urban species and non-native invasive species that are regenerating in former industrial properties. The redevelopment of the Keating Channel Precinct is expected to result in the loss of this same low quality vegetation and is documented in the *Keating Channel Precinct Environmental Study Report*. Urban wildlife that inhabits these areas would be expected to relocate (e.g., birds, raccoons, coyotes, squirrels), potentially into the Don Valley system that is nearby. During the construction phase, the project co-proponents will coordinate internally with the Port Lands Biodiversity Strategy team to identify opportunities for wildlife migration corridors.

Aquatic habitat in the Don River mouth area and Keating Channel is similarly degraded. Although these areas are important migration corridors to spring and fall spawning fish species, the existing habitat to support aquatic life beyond acting as a migration corridor is limited. These watercourses are affected by urban run-off in the Don River catchment area and are actively dredged to remove sediment. Further, the shoreline largely consists of sheet piles and lacks riparian habitat. The project will result in the permanent removal of about 4 m^2 of low quality aquatic habitat from the placement of new expressway piers in the river. There are 12 m^2 of existing pier structures currently located in the river which would be removed. As such, there would be a total net gain of 8 m^2 of aquatic habitat area with the removal of the existing larger sized piers and replacement of new smaller sized piers. Pending the requirements of *Fisheries Act* authorization, compensation for loss habitat may be provided which could be integrated into the DMNP Project. On-site compensation opportunities would be coordinated with TRCA before considering off-site compensation. It is noted that the DMNP Project will significantly improve the ecological function of the lower Don River. Project

implementation, which could overlap with the construction of the Gardiner East project, would lead to further disturbances/alteration of this poor quality habitat.

Disturbance/alteration of habitat is also possible from storm run-off from the construction site. An erosion/sedimentation management plan will be developed by the co-proponents and/or its agents and is to include the best management practices (BMPs) as outlined in **Table 6.2**. The detailed erosion/sediment management plan should include information on the possible impairment of flood conveyance during construction based on the final constructability approach that will be prepared. Integration with the DMNP Project implementation will be required to manage sedimentation issues. The project co-proponents and/or its agent(s), in coordination with TRCA, will identify an approach that allows for Lower Don River and Keating Channel sediment management operations to occur and will undertake hydraulic modelling during detailed design to minimize possible short-term impacts related to erosion/ sedimentation.

The effectiveness of these measures will be monitored after storm events to ensure they are effective and corrective actions taken if necessary. With these measures it is expected that adverse negative effects to the local watercourses can be minimized.

Operations Period

Once the project is operational, compared to the existing/future baseline condition, there would be a net improvement to terrestrial environment through the green space/ landscaping/ public realm improvements that have been committed to by the project co-proponents. In addition, once the project is operational, the co-proponents will coordinate internally with the Port Lands Biodiversity Strategy team to continue the implementation of habitat improvements. Similarly, with the relocation of Lake Shore Boulevard and the elevated expressway away from the Keating Channel and implementation of improved stormwater management, and localized habitat improvements, there is the potential for improved water quality in the channel. As well, the relocation of the connection ramps further north than their current location is also considered beneficial to future sediment management activities required to support the future re-naturalized Don River mouth area.

The current concept design, which has been reviewed by TRCA, will have no material impact on Don River flood conveyance. The final design will need to be reviewed by TRCA in coordination with Waterfront Toronto and the City to confirm this. Further, the removal of the columns that support the Logan Ramps have the potential to benefit flood conveyance by providing further flexibility in the redesign of the Lake Shore Boulevard-Don River bridge widening that is required to support the DMNP Project.

6.3.2.6 Cultural Resources

Construction Period

Much of the project area consists of lakefill and lands that have been significantly altered by land development activities in the late 1800s and early 1900s. Based on the completed Stage 1 Archaeological Assessment, because of the historical development activities in the area where construction of the undertaking is proposed, there is limited potential for the survival of Aboriginal archaeological resources in primary contexts. There is however the potential for impact on nineteenth-early twentieth century development features including Toronto Dry Docks, Toronto Iron Works and British American Oil. Once detailed design has been completed, and the areas of excavation identified (e.g., for the expressway support piers) further archaeological assessment is warranted to confirm the potential for any features to exist. Additional recovery and/or preservation measures may be warranted.

Operations Period

No effects to cultural resources or features would occur during the operation period.

6.3.2.7 Economics

Construction Period

There will be no direct removal or displacement of existing businesses as a result of the project. During periods of road closures, there could be delays to truck traffic travelling through the area similar to what automobile users would experience as previously described under the Transportation criteria group. Detour roads will be provided and advance warnings/communications of road closure periods.

Regarding downtown mobility, travel between the downtown and the east will take longer during construction. Travel during non-peak periods and through different modes will be encouraged.

Businesses adjacent to Lake Shore Boulevard east of the Don Roadway may experience some construction nuisance effects and temporary access restrictions. These business owners/operators will be advised of the construction activity and mitigation plans will be developed with their input to minimize negative effects to them.

Regarding the construction of the Lake Shore Boulevard-Don River bridge and rail spur bridge, there is potential for short-term temporary impacts to port related businesses that use rail cars which utilize the rail bridge. This includes the Ashbridges Bay Treatment Plant. The project co-

proponents and/or its agents will work with these businesses to minimize impacts during construction and coordinate rail needs during temporary construction disturbances.

Operations Period

During operations, future economic effects of the project are largely related to increased travel times as compared to the future Do Nothing condition. As previously described, traffic modelling work forecasts an increased travel time of three minutes for travel from the east during the AM peak hour. Travel time increases during non-peak periods are expected to be less. Travel to/from the north and west are unaffected and the project will maintain a continuous freeway link between the Gardiner and DVP facilitating regional movement of goods.

The provision of new access ramps in the Keating Channel Precinct just east of Cherry Street will facilitate Gardiner access for businesses located in the Port Lands.

It is noted that future travel times in the corridor will increase without the project in place because of expected growth in background traffic volumes.

6.4 Consideration of Source Water Protection

Source water protection is the protection of any untreated water which is used as a source for municipal drinking water. Drinking water is best protected by taking an approach that uses multiple barriers to prevent contamination from affecting drinking water. This approach includes taking actions to prevent contamination of source water, using adequate water treatment and distribution systems, undertaking water testing and training of water managers.

Within the Gardiner East study area there are no source wellhead protection areas and no issue contributing areas (ICA is a documented, existing problem with the quality of the source water). However, there is a concern that flooding from the Don River east towards Leslie Street could potentially impact source water. This would be considered an “Event Based” source water protection concern as it relates to major storm events. The Event Based modelling for the area east of the Don River and south of Eastern Avenue has shown that a disinfection interruption at the Ashbridges Bay Treatment Plant could cause a plant by-pass discharge to the lake and be a potential drinking water threat. Although this is a potential given existing flood potential in the study area (without the implementation of the DMNP), the proposed undertaking does not appear to negatively impact this threat as there is an overall reduction in impervious area due to infrastructure changes and therefore there are no additional protection measures recommended. The implementation of the DMNP will be the most significant contributor to addressing the Event Based source water protection concern that exists east of the Don River.

6.5 Consideration of Climate Change

The project co-proponents recognize that future climate changes could have impacts on its services, operations, and infrastructure. As a result, over the last 10 years, the co-proponents have undertaken several climate change related initiatives. In 2007, City Council unanimously adopted *Toronto's Climate Change Action Plan*. The plan sets bold targets for the reduction of greenhouse gas emissions, and outlined actions that would see the city and its residents, businesses and communities reduce emissions, clean the air and create a sustainable energy future. Using 1990 as the baseline year, the City has a target to reduce greenhouse gas emissions (GHGs) by 80% by 2050. Initiatives to help met this target include: providing incentives to make buildings more energy efficient, cutting landfill gas emissions, promoting bike usage through the bike sharing program and cycling network planning process, increasing the city's tree canopy, and expanding of the public transit system.

Waterfront Toronto is also active in the reduction of GHGs in relation to the redevelopment of the city's waterfront. Through its Minimum Green Building Requirements, Waterfront Toronto requires that all projects achieve a minimum of LEED® Gold certification, including LEED® certification credits in energy efficiency, water efficient landscaping, water use reduction, on-site renewable energy generation and measurement and verification. Other requirements include electric vehicle infrastructure, bicycle parking, green roofs, and waste management.

In 2008, the City released *Ahead of the Storm – Development of a Climate Change Adaptation Strategy*. This report outlines a number of actions that will improve the city's resilience to climate change and extreme weather events. The report recognizes that the City's Wet Weather Flow Master Plan (WWFMP) is Toronto's "single most relevant policy" for climate change adaptation.

Further, in 2012 the City released its Future Weather & Climate Driver Study. This study presents predictions of future climate conditions for the city for the purpose of informing present and future infrastructure decisions. The study results indicate that while the average number of snow storms in the winter is predicted to decrease and the number of storms in the summer is predicted decrease as well. However, extreme rainstorm events in the summer will be more extreme resulting in the maximum amount of rainfall expected in a single day and in any single hour to more than double. There will be a smaller number of storm events but on average each storm will produce a higher amount of precipitation.

In 2015, the Subcommittee on Climate Change Mitigation and Adaptation was established by the Parks and Environment Committee to report on a review of City policies, expert advice and international best practices to mitigate and adapt to climate change.

Climate change has been considered in this EA through the consideration of:

- Effects on Climate Change: effects of the undertaking on climate change; and,
- Effects from Climate Change: effects of climate change on the undertaking.

In the absence of provincial guidance documents on how climate change should be considered in EAs, this assessment was conducted considering input received from MOECC staff as well as the consideration of current best practice regarding climate change integration in EA.

Effects on Climate Change

The following describes how potential effects of the undertaking on climate change were considered in the EA.

Regarding the alternatives evaluation, GHGs were estimated through modelling of the alternative solutions: Maintain, Improve, Replace, and Remove. The results of the assessment were considered in the comparative evaluation of the alternatives. GHGs were not modelled for the alternative designs as all three Hybrid alternatives would generate similar if not the same traffic volumes and patterns and as such, there would not be a difference in the amount of GHGs generated for each of the alternative designs.

It is noted that the project will not encourage greater use of automobiles and as such will not contribute to a greater amount of GHGs over future baseline conditions. In fact, the removal of the Logan Ramps that is part of the preferred undertaking will result in a reduction in some road capacity and as a result, might entice the use of alternate modes of travel.

A major benefit of the project is that it enhances new development opportunities in the Keating Channel Precinct which is close to the downtown core and provides an alternative to living further away with greater commuting distances. The Keating Channel Precinct is within an easy cycling distance to the downtown and will be connected with transit. The project alternatives have been evaluated and the preferred undertaking conceptually designed and assessed on the assumption that planned transit projects will be in place to provide people with an alternative mode of transportation that has a lower carbon footprint than automobile travel. This includes the proposed waterfront LRT project that is planned to run in parallel to the Gardiner- Lake Shore Boulevard corridor. The preferred undertaking also allows for an extension of Queens

Quay Boulevard East that might allow for the extension of transit into the Keating Channel Precinct that was not practical under the Maintain alternative.

As part of the preferred undertaking, the project co-proponents have committed to the construction of a new off-road multi-use pathway/bikeway along Lake Shore Boulevard that would extend from the Don Roadway to at least Jarvis Street. This new pathway would complement the existing Martin Goodman Trail that extends south of the study corridor along Queens Quay. The Lake Shore Boulevard multi-use pathway would provide a more direct commuter route for cyclists and connect with the existing multi-use trail that extends east of the Don River. With this new multi-use pathway, improved connections with the surrounding pedestrian/cycling network and with proposed improvements for pedestrian/cycling crossings at intersections, it is hoped that a larger number of commuters will be attracted to active modes of transportation, further reducing reliance on automobiles and encouraging healthy communities. In addition, during future detailed design work, consideration will be given to designing this pathway with features that will encourage people to cycle/walk in various weather conditions or feel safe should extreme weather suddenly arise. Examples may include shade to protect users on extremely hot days, designed to minimize snow and ice accumulation, and allow for adequate snow clearing, also ensure no sections are flood-prone.

The project will involve the demolition of a section of the existing elevated expressway and as a result, a considerable amount of demolition debris will be available. To reduce the amount of new material for project construction and reduce the project carbon footprint, the project co-proponents will explore the potential to reuse some of the construction debris in new road and trail construction. This might involve crushing the old concrete to create granular material that could be used in new roadway construction. Cost, timing and suitability of this material would need to be considered in any decision to re-use this demolition material.

Further, the potential to construct the Gardiner deck sections off-site under an accelerated construction program is being considered by the City and may allow for a more efficient use of materials including concrete, which again would reduce the carbon footprint of the project.

Finally, the project includes a commitment to “green” the corridor which includes plantings along the multi-use pathway (where feasible given the presence of the elevated expressway). With the relocation of the Expressway through the Keating Channel Precinct and the removal of the Logan Ramps, the project will allow for an extensive greening of the corridor from about the middle of the Keating Channel Precinct through to Leslie Street. The greening of the corridor will be a positive net improvement over future baseline conditions.

Effects of Climate Change

The project by its nature is not considered to be overly susceptible to changing climate conditions and certainly is not any more susceptible than the future Do Nothing baseline condition. The new elevated section of the expressway is not prone to flooding and the location of the realigned section of Lake Shore Boulevard will not be any more susceptible than the current alignment that runs along the Keating Channel. With the planned flood protection works associated with the DMNP, the flood risk in the Keating Channel Precinct would be further reduced and as a result, the flood risk to Lake Shore Boulevard would be reduced.

The project will be constructed using the latest advancements in concrete use/manufacturing for both the elevated and at-grade road sections and as a result, is expected to have a lifespan approaching 100 years unlike the current facility which has had about a 50-year lifespan. The project will be designed to withstand extreme weather events, more frequent freeze/thaw cycles, and to better withstand the effects of roadway salting (chlorides) which is a major contributor to the deterioration of concrete and steel reinforcements.

Climate change modelling for the project area indicates the potential for larger and more frequent storm events which could contribute to greater amounts of runoff to be managed. The stormwater management system will be designed to meet the City Wet Weather Flow Management Guidelines. Furthermore, the City, through a Resilient City Working Group, has identified several adaptation actions including the use of bio-retention and low impact development within rights-of way. These options to manage stormwater will be considered during the detailed design phase of the project. As a possible climate change adaptation measure, run-off from the Gardiner could be directed to the planned new green space area north of Lake Shore Boulevard for reuse/infiltration. This serves as an alternative to the oversizing of infrastructure including storm sewers to managed high flow events.

6.6 Coordination With Other Projects - Cumulative Effects

Cumulative environmental effects include the combination of adverse effects from the undertaking with effects from other future projects or activities that are planned to be carried out within the same time period and physical space. In identifying future projects to include in the cumulative environmental effects assessment, projects that are "certain" and "reasonably foreseeable" have been considered. These include projects that have approved plans or projects that have plans/studies underway. The main projects that may contribute to cumulative effects in the study area are:

- DMNP Project;
- Future development as identified in the Lower Don Lands Master Plan, including Villiers Island Precinct Plan;
- Future Development as identified in the Port Lands and South of Eastern Area Master Plan, including the First Gulf site;
- Don River and Central Waterfront Project; and,
- Cherry Street Realignment.

The main potential cumulative effect associated with these projects is from overlapping construction periods which could contribute to increased disturbance effects to the surrounding area and additional traffic delay. Once operational, adverse cumulative effects from these projects are not expected.

The DMNP Project will provide the critical infrastructure changes needed to manage flood risk to the Port Lands and South of Eastern areas. Without the DMNP the redevelopment of these areas cannot proceed. The timing for construction of the DMNP is still being confirmed but there is the potential that both the Gardiner East project and the DMNP could have overlapping construction periods. Construction for the Gardiner East undertaking will be coordinated with the DMNP construction so as to minimize combined effects. In particular, this applies to construction related effects of works occurring in the Don River, around the banks of the Don River and along the Don Roadway north of Lake Shore Boulevard. Specific consideration will be needed for erosion/sediment management control. This includes the sediment management activities required in the Don River and Keating Channel during construction. Hydraulic modelling of construction staging is to be completed with TRCA. Once both of these projects are constructed, the simultaneous operation of these two projects is not anticipated to result in cumulative effects.

The *Port Lands and South of Eastern Transportation and Servicing Master Plan* (in progress) and the *Lower Don Lands Master Plan* (complete) and *Villiers Island Precinct Plan* (in progress) include population and employment, land use, servicing and transportation changes that will change the existing conditions in the eastern sections of the study area. The timing for the construction of these new communities is uncertain. As they require the completion of the DMNP, it is likely that construction activities would occur after the Gardiner East project has been completed. If there is the potential for development activity to occur in the same time frame as the Gardiner East project, then there would be the need to coordinate construction activities with the Gardiner East undertaking so as to limit the potential for cumulative effects.

The Don River and Central Waterfront Project includes a 25-year implementation plan for a series of major servicing projects that will provide solutions to address the problem of stormwater and combined sewer overflow discharges in the city (this is in addition to the flood protection provided through the DMNP). The projects include underground infrastructure that will capture and treat polluted stormwater and combined sewer overflows before they enter Toronto's waterways. They also include upgrades to the Don Sanitary Trunk Sewer system, including twinning of the Lower Don River / Coxwell Bypass Sanitary Trunk Sewer. Other works include an Inner Harbour Tunnel in Lake Ontario, a pumping station, new underground vertical storage shafts, and a new Wet Weather Flow Treatment facility. Not all of the works occur within the Gardiner East study area and the phasing for implementing the projects extends over 25 years. As such, the project co-proponents and its agents will need to coordinate construction activities related to the two projects in the areas where overlap is possible. The primary focus will be the Don River, Inner Harbour and Port Lands improvements. Cumulative effects will be limited through the coordinated planning of these construction projects.

The co-proponents are aware of the potential that the redevelopment of the waterfront and Port Lands could result in multiple years of ongoing construction. As all of the planned and approved projects in the study area undergo construction, there may be cumulative effects to residents and businesses if construction is ongoing for multiple years. There is recognition that considerations will need to be made to manage cumulative impacts to residents and businesses that result from ongoing construction. Efforts will be made to:

- Keep the public and businesses informed of construction activities on an ongoing basis (including location and schedules for construction);
- Ensure opportunities are available for the public and businesses to provide feedback regarding construction related concerns;
- Review opportunities to stagger construction years and phases so as to limit continuous construction in one area;
- Review opportunities to coordinate construction activities proposed along individual transportation corridors so as to reduce construction timelines and limit the requirement to commence multiple construction projects in one corridor over consecutive years;
- Coordinate with transit authorities including Metrolinx and TTC to reduce impacts to transit operations and coordinate future transit construction projects in the study area; and

- Review construction methods on an on-going basis to identify opportunities for new techniques or the use of new technologies that may reduce construction timelines.

6.7 Advantages and Disadvantages

The overall advantages and disadvantages of the Gardiner Expressway and Lake Shore Boulevard East EA and Urban Design project are presented in this chapter. Advantages are positive net effects to the natural and socio-economic environment, while disadvantages are negative net effects. The purpose of this chapter is to provide an overall conclusion as to whether, in comparison with the "Do Nothing" Alternative, the negative net effects of the project are acceptable, based on a balanced assessment against the positive net effects.

Table 6.4 presents an analysis of the advantages and disadvantages of the project organized by study lens and which draws on the assessment of effects and recommended mitigation measures as presented previously in **Tables 6.2 and 6.3.**

Table 6.4: Project Advantages and Disadvantages

Study Lens	Advantages	Disadvantages
Environment	Potential for improvement to water quality and habitat in the Keating Channel by removing the expressway away from it and the installation of improved storm runoff controls. Construction nuisance/disturbance effects are minimal as the project area is yet to be developed and receptors are well removed from the construction area. Provides opportunities to better complement the planned DMNP Project. Public realm, green space and corridor plantings will increase the amount of quality vegetation/habitat in the area.	Some potential for temporary construction nuisance effects (noise/dust) to users of the pathways through Keating Channel Precinct and McCleary Park (during removal of Logan Ramps). Loss of a minimal amount of poor quality terrestrial and aquatic habitat. Potential for some temporary sedimentation effects to local water bodies (Don River and Keating Channel) from construction site runoff during storm events. Potential negative short-term impacts on Don River flood conveyance during construction until final weirs and bridges have been put in place. Potential short-term impacts on Don River sediment management operations during construction may need to be mitigated/ avoided.
Urban Design and Planning	Allows for transformation of the Keating Channel Precinct and the redevelopment of approximately 7.5 acres of public lands with direct access to the water (Keating Channel). Allows for the development of an unencumbered water's edge promenade along the north side of the Keating Channel. Removes the barrier of the elevated expressway through Keating Channel Precinct allowing better connections through the waterfront from the Port Lands through to East	

Study Lens	Advantages	Disadvantages
	Bayfront. Makes the planned Villiers Island community more attractive by relocating the elevated expressway away from it. Removal of the Logan Ramps opens up development opportunities along Lake Shore Boulevard east of the Don Roadway including the First Gulf development which lies to the north of the corridor. Provides potential for development with direct access to Lake Shore Boulevard.	
Transportation and Infrastructure	Maintains continuous freeway connection between the DVP and the Gardiner while also providing a connection that replaces and greatly improves the structure's life span. The existing structure in this area requires significant rehabilitation if it were to be maintained. The removal of the Logan ramps eliminates the need to ever complete/budget for the rehabilitation or maintenance on that stretch of the expressway.	Temporary road traffic delays during periods of road closures during construction – most significant during peak travel periods. Temporary detouring of the pedestrian/cycling pathway through the Keating Channel Precinct will increase travel distances. Potential for short-term traffic infiltration into residential neighbourhoods during periods of road closures. Potential for temporary effects to Metrolinx rail service during widening of the rail bridge underpass. Increase in travel time during the peak period for travel between downtown and the east (south Scarborough).

Study Lens	Advantages	Disadvantages
Economics	Maintains freeway connection and provides access to the Gardiner allowing for the movement of goods. Keating Channel Precinct public lands sales revenue estimated at approximately $70 to $80 M. Complements the First Gulf land development proposal which is projected to generate in excess of 25,000 jobs serving as a major economic catalyst to the Port Lands.	Additional cost of $154 million (NPV) over the Maintain option (Do nothing). Requirement for some private property acquisition (from the First Gulf site). Removal of Logan Ramps will lengthen truck travel to the east. Potential for temporary effects to businesses in the Port Lands and Ashbridges Bay Treatment Plant during construction of rail spur bridge over Don River.

Also to be considered is the extent to which the project achieves the study goals that were articulated in the EA Terms of Reference. The extent to which these goals are achieved with the project are presented below:

Goal 1 – Revitalize the Waterfront – The improvements planned for the corridor contribute to the revitalization of the waterfront and complement other planned waterfront improvements such as the DMNP, Keating Channel Precinct Plan, Lower Don Lands Plan including Villiers Island Precinct Plan, and Port Lands and South of Eastern Master Plan. Planned improvements to the public realm will further support waterfront revitalization by improving the pedestrian and cycling experience throughout the corridor. *Goal 2 – Reconnect the City to the Lake* – The relocation of the Gardiner away from the north edge of the Keating Channel provides an opportunity to connect the Keating Channel Precinct to the water in a manner that was not previously imagined – it achieves city building objectives. The relocation of the Gardiner Expressway through the Keating Channel Precinct also facilitates improved waterfront connections between the Keating Channel Precinct, East Bayfront and the Port Lands. In addition to the improvements realized in the Keating Channel Precinct, the planned improvements at key Lake Shore Boulevard intersections between Jarvis Street and Cherry Street will facilitate better north-south connections to the waterfront for pedestrians and cyclists coming to/from the downtown area.

Goal 3 – Balance modes of Travel – The development of a new multi-use pathway along the north edge of Lake Shore Boulevard will encourage active modes of travel into/from the downtown. The multi-use trail will be coordinated with public realm improvements (e.g., streetscaping) as well as with other planned pedestrian/cycling facilities in the study area to improve the overall experience and encourage more active transportation in the area. The project results in some reduction on road capacity which might lead to the adoption of other modes of transportation by auto users not wanting further delay to their auto-based commute. This may also encourage other modes of goods movement such as rail.

Goal 4 – Achieve Sustainability – The project involves the creation of significant improved/new green space that would lie north of the Lake Shore Boulevard creating a new green ribbon. In addition, tree plantings are proposed along the Lake Shore Boulevard corridor, particularly from the future Munition Street intersection east. The project will also result reduced infrastructure in the Don River which will reduce pressures on stormwater management and sediment management facilities. The design of the new Gardiner Expressway-DVP connection through the Keating Channel Precinct will also provide opportunities to consider the use of more sustainable construction materials. Further, the detailed design process will consider opportunities to improve the management of stormwater runoff from the new Gardiner-DVP connection. Finally, with improved storm water controls associated with the relocation of the Gardiner away from the water's edge, improvements to surface water quality are possible. Future detailed design work presents further opportunities to explore the use of sustainable design techniques.

Most of the project's negative effects will occur during the construction period and, as such, will be temporary. Adverse effects on the natural environment are minimal considering the low quality of existing habitat in the project vicinity. Similarly, there are few negative social impacts due to an absence of receptors in the project area. The most notable effects are increased travel times for commuters during project construction when road closures will occur. Travel between the downtown and the northern and eastern parts of the city will be affected. Once the project is constructed and operational, the only negative effects of note are the increased travel time for auto commuters between the downtown and the east during peak travel periods (average increase of three minutes in the AM peak hour). It is noted that 90% of the downtown commuters will not experience any change in their peak period travel time as a result of the project.

In contrast, the project offers many city building advantages and fulfills to some extent all of the study goals as defined in the EA ToR. Further, the public has indicated strong support for the Hybrid 3 alternative (as the preferred alternative design) and City of Toronto Council and the Waterfront Toronto Board have also provided support for the project. In conclusion, the

negative net effects of the Gardiner East project, many of which will occur during construction and are temporary, are considered to be offset by the positive contributions of the Project, including the opportunity to develop the Keating Channel Precinct with direct access to the water, the creation of new public realm space, contributing to the creation of a better connected waterfront, complementing other major projects such as DMNP Project and Port Lands development, providing additional trees/plantings within the Lake Shore Boulevard corridor, complementing major private sector development projects including the First Gulf development, and promoting alternative modes of transportation through the provision of a new multi-use pathway.

7.0 Summary of Consultation

7.1 Consultation Program Overview

A significant amount of consultation was undertaken during the course of this EA. Nearly 30,000 people participated in a variety of in person and online engagement opportunities between 2009 and 2016. The EA process and design decisions regarding the future of the Gardiner Expressway and Lake Shore Boulevard East have interested many residents and businesses across Toronto. As such, the consultation process involved reaching out to citizens at various key points in the EA study to gather input, help inform alternative solutions and designs, and to understand the interests, concerns and preferences of the community. The result was that the preferred design alternative reflects the input received during the study.

To fulfill the principles and objectives of the consultation program defined during the Terms of Reference (ToR) phase of the study, as well as regulatory consultation requirements mandated under the *Environmental Assessment Act*, a wide range of communication and consultation activities was undertaken as part of this EA study. Communication and information materials, including public notices, notices to Aboriginal communities, e-notices, project website updates and social media posts were released to inform people of the study progress and provide information for review and comment. Interactive consultation activities were also undertaken, including stakeholder meetings, public meetings and online consultation forums to encourage awareness of the project and facilitate broad participation.

During the development of the ToR in 2009, public and stakeholder consultation played a key role in defining the consultation process to be undertaken during this EA study. Consultation activities during the ToR phase included stakeholder workshops, public forums, online engagement opportunities and outreach to Aboriginal communities.

During the subsequent EA phase of the study, five rounds of public consultation, based on the technical work completed for each phase of the study, were held between May 2013 and January 2016 and engaged nearly 30,000 citizens, including website visits). Consultation with government agencies and ministries, Aboriginal communities, a Stakeholder Advisory Committee and the project's Technical Advisory Committee were also convened throughout the study.

This chapter is intended to be a high level summary of the consultation that was undertaken during the EA. The **Record of Consultation**, contained in **Appendix B**, provides a detailed

outline of the consultation activities that were undertaken, the feedback that was received, and responses to questions.

Table 7.1 below outlines the key consultation activities that were conducted during the development of the ToR and Gardiner East EA.

Table 7.1: Key Consultation Activities as Part of the Gardiner East EA

Component	Description
Public Forums	Public forums were held during the ToR phase and each round of consultation to obtain public feedback on technical work completed during each phase of the EA. Two rounds of public forums were convened during the ToR phase and five rounds were held during the EA phase of the Gardiner East EA. After each of the rounds of consultation, a consultation summary report was prepared and made available to the public through the Project Web site.
Public Notices	Formal notices regarding the ToR and the EA were published at various times throughout the study in local newspapers and online to launch each round of consultation and promote and encourage participation. Notices were generally released about 2 weeks in advance of the formal events.
Aboriginal Communities	In accordance with the City's First Nation Consultation Protocol for Environmental Assessments, formal study notices were circulated to Aboriginal communities that had been identified as having a potential interest in the study. This correspondence invited Aboriginal communities to participate during the ToR phase of the study and each round of EA consultation, and to invite the opportunity for direct engagement with the Aboriginal communities. Discussions are ongoing with Aboriginal communities including the Mississaugas of New Credit First Nation.
Stakeholder Advisory Committee (SAC) Meetings	The SAC was formed at the outset of the EA phase in 2013 and included members from approximately 40 key interest groups and community associations. The mandate of the SAC was to provide an ongoing forum for advice and guidance to the project team at key points during the Gardiner East EA. A total of 11 SAC meetings were convened during the study.

Component	Description
Technical Advisory Committee (TAC) Meetings	The TAC was formed during the ToR phase to provide input at key milestones during the study process, and included representation from various City Divisions, Toronto Transit Commission (TTC), GO Transit/Metrolinx and Toronto and Region Conservation Authority (TRCA). The TAC as a whole met a total of four times during the study. Numerous meetings were also held with key member agencies throughout the EA process, including, for example, Metrolinx and TRCA.
Stakeholder Workshops and Working Groups	Two stakeholder workshops were convened to engage a wide range of stakeholders during the ToR phase. Further, topic specific Working Groups were formed in Fall 2014 as directed by the Public Works and Infrastructure Committee (PWIC) of Toronto City Council and met two times each to discuss the role of the Gardiner East in relation to economic competitiveness and the movement of goods in the immediate study area and Downtown Toronto.
Individual Stakeholder Meetings	Face-to-face meetings with specific organizations or groups (e.g., property owners, land developers, third-party proposal proponents, Business Improvement Areas, the Canadian Automobile Association) were held as needed throughout the study.
Committee and Council Meetings	PWIC and Toronto City Council met at key decision points during the study to review progress and provide direction for the study. These meetings were publicly advertised, open to the public and in some cases deputations were made by various stakeholders and this information was also considered by the project team.
Waterfront Toronto Board Meetings	The project team provided regular updates about the Gardiner East EA to the Waterfront Toronto Board throughout the study.
Online Engagement	The project website (www.gardinereast.ca) served as a portal for all information and engagement activities during the consultation process. In parallel with the face-to-face consultation activities, online options were also available during each round of consultation via the project website to further encourage participation. E-blasts, email invitations, social media and media advisories were also used to promote stakeholder and public awareness of consultation activities at the outset of each round of consultation.

Component	Description
Facilitator's Office – "One-Window" Point of Contact	The Facilitator's Office provided a "one-window" point of contact for the project, with dedicated phone, fax and email connections to facilitate communication with stakeholders and the public during each round of consultation. The "one-window" customer service centre provided basic information about the project in response to inquiries and served as a focal point for receiving questions and comments and providing responses throughout the study.

7.2 Summary of Major Consultation Events

Summaries of the input received during each round of the consultation are provided below and reflect the feedback received through the face-to-face and online consultation activities. **Appendix B, Record of Consultation**, provides full documentation of the consultation input received.

7.2.1 Round 1 – Key Ideas for the Future of the Gardiner East

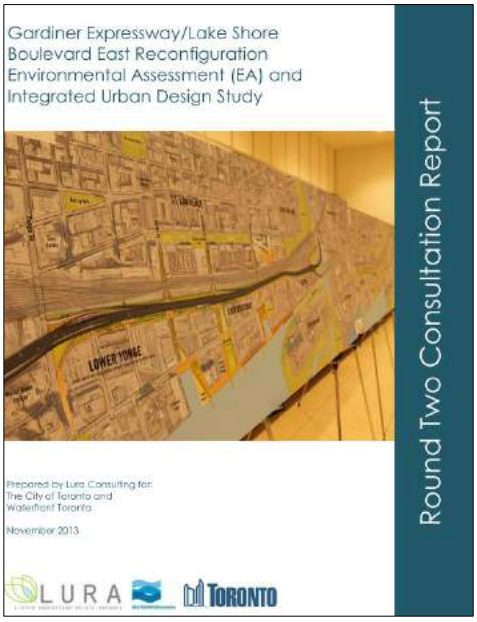
The purpose of this round of consultation was to introduce and obtain feedback on 14 "key ideas" informed by case study research and design concepts submitted by six international design teams in 2010. Round 1 of the EA public consultation process was held between May 28 and June 28, 2013, and engaged over 1,000 individuals (4,596 individuals with website visits) and 20 stakeholder groups. This round of consultation included the holding of a formal public meeting on June 13, 2013.

The top five most important ideas identified by participants corresponded to the Replace or Remove alternatives, and indicated strong public support to:

1. Balance transportation modes;
2. Enhance waterfront connectivity;
3. Incorporate alternative transportation; or,
4. Develop new transportation infrastructure and enhance the public realm.

The five least important ideas identified by participants corresponded to the Maintain, Replace and Improve alternatives and suggested limited public support to rehabilitate the existing expressway, rehabilitate the existing public realm, build a signature crossing over the Don River or improve the appearance of the existing expressway infrastructure.

7.2.2 Round 2 – Alternative Solutions



The purpose of Round 2 of the consultation process was to present and obtain feedback on the draft alternative solutions and evaluation criteria proposed. This second round of public consultation took place between October 1 and October 31, 2013, and engaged over 1,500 individuals (5,803 individuals with website visits). This round of consultation included the holding of a formal public meeting on Wednesday, October 16, 2013.

Participant feedback revealed strong support for the Remove alternative based on the opportunities it presented to revitalize and redevelop the study area, particularly the public realm. Participant support for the Maintain alternative was limited and associated with this alternative's ability to preserve existing road capacity and disrupt traffic the least. Varying support for the Improve and Replace alternatives was also expressed by participants in relation to the costs and benefits they attributed to each one.

Feedback received regarding the evaluation criteria was generally supportive of the criteria presented by the project team. Input from participants focused on the need to provide a balanced evaluation for each study lens to achieve the study goals.

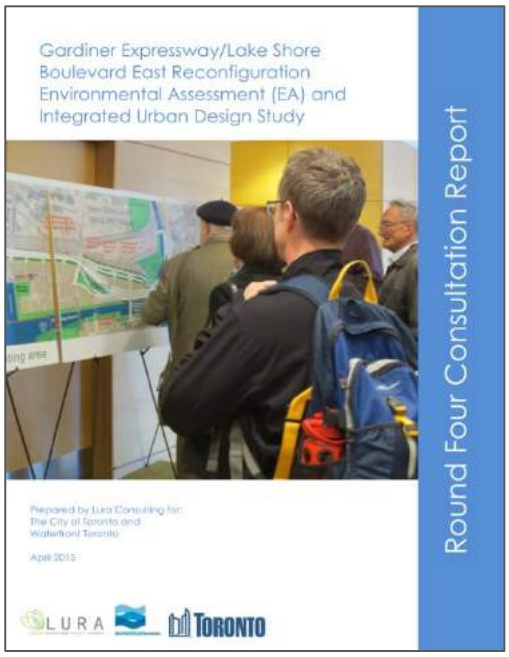
7.2.3 Round 3 – Alternative Solutions Evaluation

The purpose of this round of consultation was to present and obtain input on the draft assessment results of the four alternative solutions (Remove, Replace, Improve, and Maintain). Round 3 of the consultation process engaged more than 1,300 individuals (4,131 individuals with website visits) between February 4 and 20, 2014. This round of consultation included the holding of a formal public meeting on February 6, 2014.

Based on the feedback received, the majority of consultation participants (approximately 60 percent) supported the Remove option, followed by support for the Maintain (12 percent), Improve (4 percent) and Replace (4 percent) alternatives. Approximately 20 percent of participants provided general feedback on the evaluation results and/or advice to the project team and did not express clear support for any of the alternatives. Advice to the project team included general suggestions to clarify the trade-offs of each alternative as well as recommendations specific to the following theme areas: transportation and infrastructure, urban design, environment, and economics.

Following the formal consultation on the draft alternative solutions assessment results, an *Alternative Solutions Evaluation: Interim Report (February 2014)* and February 21, 2014 City Staff report was prepared and publicly released. The results and recommendations in these reports were considered by PWIC at a March 4, 2014 meeting. At this meeting several deputations were made from a variety of stakeholders including members of the public, local resident association representatives, Downtown BIA, major land developers, and Port Lands area businesses. Opinions for and against the Remove alternative were presented. Considering the input received, including concerns about the additional modeled traffic travel times under a Remove scenario, PWIC directed the study team to further optimize the Remove alternative to reduce traffic congestion and to develop a Hybrid alternative. PWIC also directed that studies be undertaken to assess the impacts of both alternatives on goods movement and economic competitiveness (Further details regarding the PWIC directions related to alternative solutions are provided in **Chapter 4**).

7.2.4 Round 4 – Updated Evaluation of Alternative Solutions



The focus of this round of the consultation process was to present and obtain input on the results of the additional alternative solutions work directed by the PWIC (optimization of auto travel times for the Remove alternative and development of a Hybrid alternative). More than 1,400 individuals (8,746 individuals with website visits) participated in the fourth round of consultation which took place between April 13 and 24, 2015. This round of consultation included the holding of two formal public meetings on April 15 and April 20, 2015.

Several recurring themes emerged in the feedback and advice provided by participants about key considerations to guide decision-making and balance diverse priorities:

- Road Capacity and Travel Time
- Cost
- Public Realm
- Safety and Accessibility
- Public Transit
- Active Transportation
- Construction
- Economic Development
- Future Development

Feedback from participants also raised the following additional key considerations:

- prioritize people over cars;
- learn from the experiences of other cities that have removed highway infrastructure; and,
- focus on the alternative that integrates flexibility to adapt to long-term needs.

Feedback on the Alternatives included:

Remove – Participants who indicated support for the Remove alternative typically provided the following reasons:

- Contributes to broader city building goals.
- Improves the public realm for a variety of users.
- Presents the most cost-effective solution.
- Improves urban design in the study area.
- Reconnects the City to the waterfront.
- Frees land for future development.
- Integrates transit and active forms of transportation.
- Replaces out-dated infrastructure.
- Increases traffic time marginally.

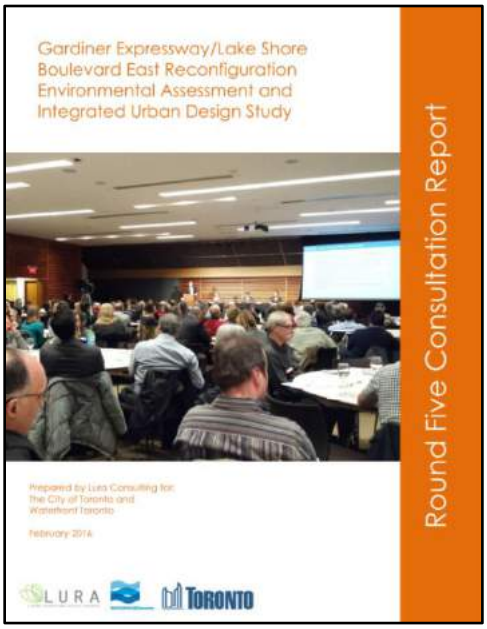
Hybrid – Participants who indicated support for the Hybrid alternative generally provided the following reasons:

- Does not decrease road capacity.
- Does not significantly increase travel time or add to congestion.
- Maintains a continuous expressway connection between the east and west ends of the City and into the downtown core.
- Supports the movement of goods and transportation needs of local businesses.
- Enhances safety better than the Remove alternative.

Concerns about projected increases in travel times, safety, impacts from construction, assumptions about public transit and the potential for future development were expressed by participants about both alternatives.

Following the formal consultation on the assessment results of the Remove (Optimized) and Hybrid Alternative Solutions, an *Alternative Solutions Evaluation Interim Report – Addendum (May 2015)* was prepared and publicly released along with a May 6, 2015 City Staff Report. The results and recommendations in these reports were considered by PWIC at the May 13, 2015 meeting. At this meeting several deputation were made from a variety of stakeholders including members of the public, local resident association representatives, Downtown BIA, major land developers, and Port Lands area businesses. Various opinions on the Remove (Optimized) and Hybrid alternatives were presented. On June 10, 2015, the Remove (optimized) and Hybrid alternative solutions assessment results were debated in City Council where the Hybrid Alternative was selected as the preferred EA solution.

7.2.5 Round 5 – Evaluation of Alternative Designs for the Hybrid Option



The purpose of this fifth round of consultation was to obtain feedback on the evaluation of alternative designs for the Hybrid alternative (which had been endorsed by Toronto City Council as the preferred alternative solution), as well as planning and urban design concepts for the study area. Consultation round 5 occurred between January 5 and 29, 2016 and engaged more than 1,550 individuals (3,682 individuals with website visits). This round of consultation included the holding of a formal public meeting on January 19, 2016.

Recurring comments were received that applied broadly to all three alternative designs for the Hybrid option, as well as proposed urban design concepts for the study area. In comparing the three design alternatives and associated public realm plans, most participants expressed support for either Hybrid 2 or 3, which realigns the expressway link away from the Keating Channel, with Hybrid 3 receiving the most positive feedback. Very little support was expressed for Hybrid 1 due to its impact on future development as per the Keating Channel Precinct Plan.

Following the formal consultation on the assessment results of the Hybrid Alternatives, an *Alternative Designs Evaluation Interim Report (February 2016)* was prepared and publically released along with a February 17, 2016 City Staff Report. The results and recommendations in these reports were considered by PWIC at a March 1, 2016 meeting. At this PWIC meeting, several delegations were made from a variety of stakeholders including local resident association representatives and third party proposal team representatives. The delegates largely expressed support for Hybrid 3. PWIC endorsed the recommendation for Hybrid 3 and referred and decision to City Council. On March 31, 2016, Hybrid 3 was selected as the preferred alternative design by a vote of 35-5 by City Council.

7.2.6 Aboriginal Community Consultation

In accordance with the City's First Nation Consultation Protocol for Environmental Assessments, which was developed in consultation with the Ministry of the Environment and Climate Change (MOECC), the Ministry of Aboriginal Affairs (MAA) and Aboriginal Affairs and Northern

Development Canada, the following communities were identified as having a potential interest in the EA:

- Alderville First Nation
- Beausoleil First Nation
- Chippewas of Georgina Island First Nation
- Chippewas of Rama
- Curve Lake First Nation
- Hiawatha First Nation
- Mississaugas of Scugog Island
- Moose Deer Point First Nation
- Mississaugas of the New Credit First Nation

Unless requested otherwise, letters and emails were sent to each of the communities advising of the five PICs.

The Hiawatha First Nation corresponded with the project team and advised of an interest in the project. Project materials were provided and an offer to meet was made, however, a meeting was never requested.

Curve Lake First Nation sent a letter on July 11, 2013 acknowledging receipt of the notice of PIC 1 and broadly outlining what the Curve Lake First Nation's interest may be in the project (limited to archaeological at this point). Further communication by phone and email confirmed that Curve Lake First Nation wants to be sent a copy of the draft EA when available for review and comment. They have further asked that they not be sent any further meeting notices.

Alderville First Nation sent an October 7, 2013 letter advising that the Gardiner East EA is deemed as having minimal potential to First Nations' rights. Accordingly, they have requested to be kept apprised of any archaeological findings, burial sites or any environmental impacts should they occur.

The Mississaugas of the New Credit First Nation provided a letter in early 2016 stating an interest in the project. A meeting was held on May 5, 2016 at the Mississaugas of the New Credit First Nation reserve. Members of the project team provided a presentation about the Gardiner East EA and answered questions about the project. A number of project related materials were provided and dialogue about the project continues.

A more detailed description of Aboriginal community consultation materials, meeting agendas and summaries is provided in **Appendix B, Record of Consultation**. A copy of the City's First Nation Consultation Protocol for Environmental Assessments is also included.

7.3 Influence of Consultation on the EA Study

The following provides a summary of how the input received throughout the consultation program influenced the EA study and outcome:

- Changes were made to both the draft alternative solutions and draft alternative designs evaluation criteria, following public input reflecting important community attributes.
- Identification of key problem areas in the corridor including key intersections that require improvement to better facilitate pedestrian and cyclist crossings.
- Identification of types of public realm improvements in the corridor that are desired by the community.
- The SAC was an important sounding board regarding the draft public information and communication materials. Throughout the public forums, significant changes were made to the presentation materials following SAC review to ensure that the messages and information were clear and understandable.
- Economic and business stakeholders (including the Canadian Automobile Association) expressed concerns regarding increased vehicle travels times under a Remove scenario – this was a key reason for PWIC to recommend the optimization of the Remove alternative and the development of the Hybrid alternative. Furthermore, direct consultation was held with many of the business interests to obtain information of their travel needs and concerns.
- Major landowners/developers provided comments on the alternatives including expressing the benefits of removing the Logan ramps and the need to adjust the design of the proposed east of Cherry Street access ramps for the Hybrid alternative.
- The West Don Lands Committee expressed concerns regarding the impact of the Hybrid design east of the Cherry Street ramps on the Keating Channel Precinct public realm opportunities and provided rationale to explore alternative alignments for the Hybrid to reduce the ramps. Improvements have also been proposed to the Cherry Street intersection reflecting the West Don Lands Committee vision of this area being a gateway to the Port Lands.

- Two alternative solutions were proposed by two third-party teams (Green Gardiner and Viaduct) which were further refined and evaluated by the Gardiner East project team.
- Several stakeholders, including for example, West Don Lands Committee, First Gulf, and the Third-Party teams, expressed the desire to align the expressway closer to the rail tracks through the Keating Channel Precinct which assisted in the development of Hybrid Design Alternatives 2 and 3.
- TRCA provided input to the design of the Hybrid design alternatives to minimize effects on the future Don Mouth Sediment Control facility and to ensure that Don River floodwaters are not impeded.
- Metrolinx provided input regarding their expectations for mitigation during the construction of the rail bridge underpass widening and provided important information regarding the long term plans for the Union Rail Corridor. Metrolinx also provided input on the process to be followed for reviews of detailed designs and staging plans that are related to or may affect the rail corridor and railway infrastructure.

Consultation input received throughout the EA study greatly informed the process and results of the EA. The public, stakeholders, and agencies who participated in the process were able to see how the designs evolved over the course of the study and understand the decision-making process followed. The project co-proponents are committed to continued consultation with interested agencies, stakeholders, Aboriginal communities and residents as the project proceeds into detailed design and implementation.

8.0 EA Amendment Procedures

8.1 Accommodating Future Changes to the Undertaking

The undertaking has been developed at a conceptual level of detail. Some aspects of the undertaking may therefore require refinements or changes between EA approval and implementation that is planned to occur from 2019. Some of the refinements and/or changes may be as a result of detailed design work. Furthermore, the project area including the Keating Precinct, Don River mouth area, and South of Eastern/Port Lands, is very much in a transitional state with many planned developments and changes proposed for the area. The EA was undertaken based on the best information available at the time regarding these planned developments, most of which had not completed final designs. Considering that the undertaking has been developed at a conceptual level of design only, and that there could be other changes made to the surrounding lands as the plans for the area mature, changes to some of the components of the undertaking may be required or desirable after EA approval.

Following EA approval, proposed changes to the undertaking will be documented by the co-proponents, and in pre-consultation with MOECC staff shall be classified as Minor or Major Changes. Minor Changes to the undertaking would include proposed project design refinements that do not trigger additional regulatory approval, though may require consultation meetings with directly-impacted stakeholders (see Section 8.3 for additional detail). Major Changes to the project are more significant changes to the undertaking that may require additional regulatory approval, and/or additional stakeholder consultation, (see Section 8.4 for additional detail).

In addition, the co-proponents may use the Municipal Class EA process to consider and document changes to components of the undertaking that are listed as activities under the Municipal Class EA. Project changes may be considered as part of separate Municipal Class EA studies (an update to the Keating Precinct Plan, for example) or as individual activities under the Municipal Class EA. In either case, the minimum consultation requirements outlined in the Municipal Class EA will be met.

8.2 Pre-Consultation with MOECC Regarding Proposed Changes

The co-proponents commit to engaging MOECC in ongoing pre-consultation dialogues to review proposed changes to the undertaking. These informal discussions of changes shall assist the parties to determine the significance of the proposed change and the appropriate process needed to consider the proposed change.

8.3 Post-EA Process for Minor Changes

Definition of Minor Changes Minor Changes would include design refinements that may occur as a result of detailed design work and or to accommodate changes to other projects or plans in the project area. Minor Changes shall not trigger additional regulatory approval, though may require consultation meetings with directly affected stakeholders (as determined through pre-consultation dialogue). Minor Changes are considered to be changes that:

- Help to achieve the desired outcomes of the project;
- Do not substantially change the proposed undertaking;
- Would not result in different or greater net effects than described in the EA Report;
- Would not require significant new or additional mitigation measures than committed to in the EA Report; and/or
- Would not create significant negative impacts for new or additional stakeholders or landowners.

The following provides examples of potential Minor changes to the undertaking. This list is provided for illustrative purposes and is not intended to represent a list of all the possible Minor changes that might be considered or proposed.

- Changes to the basic facility design including for example roadway lane configuration, intersection design details, ramp configuration, expressway height, etc.;
- Changes in the number of expressway support structures and/or the location of support structures as identified in the concept plans presented in the EA;
- A change in the location/defined physical limits of a component of the undertaking including for example, the roadway footprint, where the change results in similar or reduced net effects that have been identified in this EA Report and would not significantly impact landowners;
- Adjustments to temporary detour roads to take advantage of more suitable routes/rights-of-way at the time of construction as well to not interfere with the implementation of other projects or plans in the area, where the change results in similar or reduced effects that have been identified in this EA Report;

- The removal of a component of the undertaking that is determined to be no longer required as a result of future project design work; and
- Additional design details and/or further refinement of public realm improvements where there is no demonstrable net reduction in public realm area and/or experience.

Process for Minor Changes

The City and Waterfront Toronto shall document the scope of the Minor change(s) to the undertaking, summarize outcomes of any required stakeholder meetings, and make a formal submission to the MOECC. The MOECC shall undertake best efforts to provide a timely response to the proposed Minor Change. Where the MOECC consents to the proposed change, no further action is required.

Where the MOECC determines additional information, analysis and/or stakeholder meetings may be required, the co-proponents shall provide additional requested information to the Director of Environmental Assessment and Approvals (EAA) Branch in a timely manner.

After formal receipt and review of submission materials, the MOECC may determine at its sole discretion that a proposed change does not meet the definition of a Minor Change. In any such instance, the Post-EA Approval process for Major Changes, as outlined in Section 8.3 of this report, shall apply.

8.4 Post EA Approval for Major Changes

Definition of Major Changes. Major Changes are more significant changes to the undertaking, and may require additional regulatory approval, and/or additional stakeholder consultation, before proceeding with any such proposed changes. Major Changes are considered to be changes that:

- Negatively impact the ability to achieve the project objectives;
- Result in new or additional net effects than described in the EA Report;
- Require significant new or additional mitigation measures than committed to in the EA Report; and/or
- Would create significant negative impacts for new or additional stakeholders or landowners.

The following provides examples of potential Major Changes. This list is provided for illustrative purposes and is not intended to represent a list of all the possible major changes that might be considered or proposed:

- Substantial change in the alignment of the expressway and roadway components that results in new and/or greater net effects;

- Change to the facility design that results in substantial change in access through the area and/or travel patterns and times; and
- Reduction in the benefits of the undertaking including a demonstrable net reduction in public realm area and/or experience.

Approval of Major Changes

The co-proponents, in consultation with the MOECC, will determine whether a proposed change is Major.

Once this determination is made, the City and Waterfront Toronto will prepare a report that will document the proposed Major Change(s) and their potential effects including mitigation of effects (net effects). The report will draw upon appropriate technical expertise and new information (e.g. results of the detailed design exercise) to determine the effects of the proposed change in relation to the predicted effects outlined in the EA.

The report will include:

- The need or rationale for the Major Change(s);
- Description of the project change(s);
- Description of how the change(s) will affect project outcomes and achievement of objectives;
- Assessment of predicted effects on the environment;
- Comparison of anticipated effects of proposed change(s) to effects predicted from the original design as described in the EA;
- If required, propose new or additional mitigation to address the additional or new effects;
- Document consultation undertaken or comment on the need for additional consultation with the public, including if applicable, with the stakeholders and regulatory agencies that would be directly affected by the project changes, if applicable.

This report will be submitted to the Director of the Environmental Assessment and Approvals (EAA) Branch. The MOECC will undertake best efforts to provide a timely response.

Proposed Major Changes may require an amendment to the approved EA and approval by the Ministry of Environment and Climate Change. This is to be determined by the MOECC upon receipt and review of the submission materials.

9.0 Conclusions and Next Steps

Waterfront Toronto and the City of Toronto (City), the project co-proponents, have jointly undertaken this Individual Environmental Assessment Study to determine the future of the eastern portion of the elevated Gardiner Expressway and Lake Shore Boulevard from approximately Lower Jarvis Street to approximately Leslie Street. The study was undertaken in response to calls to consider reconfiguration options for this corridor that would better balance modes of transportation and create new and improved connections between the city and the lake. As well is the recognition that the condition of the eastern expressway deck is nearing the end of its service life and requires full rehabilitation. The study process was made up of two overarching components:

1. An Individual Environmental Assessment pursuant to the Ontario *Environmental Assessment Act* to assess proposed changes to the existing eastern section of the elevated Gardiner Expressway and Lake Shore Boulevard; and
2. An urban design review that yields a vision for the future of the area occupied presently by the eastern section of the elevated Gardiner Expressway and Lake Shore Boulevard.

This unique integrated study process has focused on completing a comprehensive technical analysis to generate a preferred undertaking that is rooted in strong city-building objectives. As a result of this EA process, which included a thorough examination of alternative solutions and alternative designs, the Hybrid 3 alternative was identified as the preferred undertaking. This includes:

1) The removal of the existing expressway east of Cherry Street and the construction of a new expressway link with the Don Valley Parkway (DVP).

2) The construction of a realigned Lake Shore Boulevard from Cherry Street to Don Roadway with new ramps to and from the Gardiner Expressway and the replacement of the Lake Shore Boulevard bridge over the Don River.

3) Reconstruction of Lake Shore Boulevard east of the Don River to Logan Avenue.

4) Implementation of public realm improvements in the corridor from approximately Jarvis Street to approximately Leslie Street.

During the course of this EA, an assessment of effects of the undertaking has been completed and mitigation and enhancement measures have been recommended. In completing the effects

assessment, consideration was given to climate change, cumulative effects and effects on source water protection areas.

The overall advantages and disadvantages of the Gardiner East project were also determined and compared against the "Do Nothing" Alternative. The negative net effects of the Gardiner East undertaking will largely occur during construction and are temporary. These negative effects are considered to be offset by the positive contributions of the project, including the opportunity to develop the Keating Channel Precinct with direct access to the water; the creation of new public realm space, contributing to the creation of a better connected waterfront; the accommodation or enhancement of other major projects such as the Don Mouth Naturalization Project (DMNP) and Port Lands and South of Eastern Area redevelopment; the provision of additional trees/plantings within the Lake Shore Boulevard corridor; opportunities for improved north-south connections between the city and the waterfront; the accommodation of major private-sector development projects including the First Gulf development; and the promotion of alternative modes of transportation through the development of a high-quality multi-use pathway.

The Need for a Decision

A final decision on the Gardiner East EA is imperative. The elevated Gardiner structure was constructed in sections between 1955 and 1966. The deck and concrete barriers east of Jarvis Street are in poor condition and are considered to be at the end of their service life. The effects of weathering, winter salting, and the loads imposed daily by an estimated 110,000 vehicles, particularly on the steel-reinforced concrete elevated section, have taken their toll on the structure.

Recognizing that implementation of the preferred EA alternative design would not likely commence until 2020, Toronto City Council has authorized $14 million of interim repairs to make this eastern portion of the structure safe and extend its service life to 2020. These repairs consisted of: temporary timber bracing under the deck; localized concrete deck repairs; and repair and replacement of severely deteriorated parapet walls.

Even with City Council's endorsement of Hybrid 3 confirmed, lengthy timelines are required to: complete the Environmental Assessment process, including approval from the Ontario Minister of the Environment and Climate Change; undertake detailed design; prepare construction tender documents; and procure the necessary construction contractor(s).

After decades of uncertainty and numerous costly studies on the future of the Gardiner/Lake Shore corridor, agreement and decisive action are needed with respect to the eastern segment of the expressway, which has considerable potential for redevelopment and positive change.

9.1 Commitments to Future Work

The following discusses future work required to advance the project to the construction stage. Key future work items, as discussed below include: detailed design work, completion of a detailed constructability and staging plan, the need to consider the advancement of other projects and plans in the project area, Keating Precinct Plan update, and Pubic Realm Plan development.

9.1.1 Detailed Design

The preferred alternative has been developed to a conceptual level of detail sufficient to identify likely impacts and to recommend mitigation measures to address those impacts. This included completion of conceptual plans and profiles of the preferred alternative, the illustration of lane configurations and approximate alignments of the new ramps, setting approximate road/ramp and bridge deck widths, identifying representative locations of new piers/columns to support the new bridge decks and resolving general lane arrangements and intersection layouts on the new Lake Shore Boulevard and Don Roadway alignments. Further, a high level construction staging option was developed that illustrates the kind of construction phasing and temporary works that may be necessary to implement the project. It will be necessary to advance the design of the preferred undertaking through the completion of detailed design work. The following highlights some key considerations that will need to be taken into account in the development of the detailed design.

Metrolinx Rail Bridge

To maximize the amount of northerly shift for the DVP Ramps through the Keating Channel Precinct for the Hybrid 3 preferred design, the development of the required ramp and Don Roadway exit/entrance treatments was initiated north of the Metrolinx Bridge. This resulted in the need to accommodate a wider treatment with shoulders and a greater separation between the DVP lanes and the Don Roadway lanes in both north and south directions at the bridge location. In addition, the locations available for the placement of new piers with the preferred alternative do not line-up with the existing pier locations. With the current preferred layout, if a new centre pier is located between the future southbound and northbound lanes, it would be situated approximately in the centre of the existing northbound lanes of the DVP. This will require the development of a staging plan that minimizes traffic disruption. Further, it is understood that Metrolinx requires that the impact to operating rail lines during construction be minimized.

New Gardiner – Don Valley Parkway Crossing Ramps of Don River

It will be necessary to more accurately locate and size the new ramp elements that cross the Don River. This will enable any potential floodplain impacts to be confirmed and addressed in coordination with the TRCA. The recommended profile for the new DVP ramps has been configured so that it reaches an appropriate height before crossing over the river. This was determined through flood conveyance modelling and through discussions with the TRCA. The height is based on achieving a similar elevation to the recommended height of the TRCA proposed Valley Wall Feature to be located immediately to the east of the Don Roadway that will provide flood protection. Other revisions to the ramps may be warranted to accommodate the Don Mouth sediment management activities once confirmed by TRCA.

Further, the EA developed approximate sizes and locations of the new Gardiner-DVP ramp columns/piers in and adjacent to the Don River. Although the preferred alternative will result in only two piers in the Don River, it will result in the placement of two new DVP ramp bridge abutments and approximately 10 new bridge piers within the immediate river regulatory flood plain. Of the alternative designs considered, the TRCA indicated a preference for the Hybrid 3 alignment as it is most removed from the area planned for sediment management in the Don River mouth. It is acknowledged that the detailed design work will need to be undertaken in a coordinated manner with the DMNP team, including those involved with the ongoing work related to the Don River sedimentation facility.

Don Roadway

The Don Roadway will provide a local connection to and from the Don Valley Parkway and provide access to the First Gulf development area to the east as well as the Port Lands to the south. It will also be used as a DVP detour route during some stages of construction. Single entrance/exit lanes are proposed at the north end to and from the DVP, widening to five lanes at the intersection with Lake Shore Boulevard. It will be necessary to finalize the lane arrangement to assess property requirements and determine general detour layout aspects and related considerations of TRCA's Valley Wall Feature proposed along the east side of the road as well as other changes that might be required to the Don Roadway to accommodate the DMNP. For this item, coordination with TRCA, First Gulf and other property owners will be required. This coordination will focus on identifying and confirming additional land needed on the east side of the existing Don Roadway to accommodate both the Don Roadway realignment and the potential integration of the TRCA Valley Wall Feature.

Lake Shore Boulevard and Rail Spur Crossing of the Don River

The future configuration of the Lake Shore Boulevard/Rail Spur crossing over the Don River was assessed as part of the Keating Channel Precinct Plan and Environmental Study Report (ESR). This earlier assessment assumed that the Gardiner Expressway (Logan Ramps) would continue to pass over Lake Shore Boulevard in this area and called for retaining the existing two-span bridge and adding three new spans to the west in order to increase the river passage under the bridge. The recommended layout and configuration is no longer appropriate as the required cross-section for Lake Shore Boulevard, as determined in the Gardiner East EA, is much wider than considered in the Keating Channel Precinct ESR, which maintained the existing four-lane Lake Shore Boulevard cross section. The recommendations for the new bridge now call for a seven-lane bridge with sidewalks/pathways on both sides. This will require the replacement of the existing bridge (including rail spur). The recommended new bridge, with seven lanes for Lake Shore Boulevard, accommodates the width of the river passage underneath the bridge as approved in the Keating Channel Precinct ESR and does not make changes to that part of the design: only the number of lanes for Lake Shore Boulevard (and therefore the width of the bridge itself to accommodate those lanes) will change.

In previous evaluations of various bridge treatments completed under the Keating Channel Precinct ESR (including one involving complete replacement of the existing bridge), the need to accommodate the existing Gardiner columns and overhead deck played an important role in the selection of the preferred option. The option to raise the Don River bridge profile to further accommodate flood conveyance could be explored by the DMNP EA team as the removal of the overhead expressway opens up this opportunity. The existing rail spur bridge over the Don River predates the Lake Shore Boulevard bridge but its abutments are in-line and connected to the abutments and piers of the roadway structure. The new rail spur bridge will likely be a separate bridge but, similar to the existing configuration, could share some structural elements with the new Lake Shore Boulevard bridge. The replacement of the Lake Shore Boulevard and rail spur bridge(s) will be considered in coordinated manner with the DMNP EA team in future detailed design activities.

Cherry Street Treatment

The recommended EA alternative was based on Cherry Street being shifted to its ultimate location and orientation west of the current intersection with Lake Shore Boulevard (as per the Lower Don Lands Master Plan and Keating Channel Precinct ESR). Additional work will be required to assess how the construction of planned Cherry Street realignment, including the Cherry Street/Lake Shore Boulevard intersection, should be coordinated between the implementation of the Gardiner East EA and the Port Lands Flood Protection project.

Safety Measures for Tight Ramps

Various safety audits and reviews were completed during the EA to address concerns with respect to traffic safety of the new Gardiner – DVP connection ramps. These freeway to freeway, directional ramps will have a design speed considerably lower than the adjoining roadways that they connect. A list of safety measures has been suggested for consideration to address the concerns. This work task will involve reviewing the suggested measures (and others if deemed appropriate) to provide recommendations.

9.1.2 Construction Detour Route Review

The general construction staging review completed during the EA recommended the implementation of a detour route that runs south of the existing corridor during the construction of the bridge and road works in the Keating Channel Precinct. This detour would also exist during the removal of the old bridge/ramp decks. A detailed road detour plan will need to be developed prior to construction initiation that considers:

- Extent of the detour including the location of the points where the detour route connects back to the existing Lake Shore Boulevard east and west of the Don River;
- The cross-section of the detour, including number of lanes, lane widths, bike path allowances, etc.;
- Keating Channel crossing of the detour route (either as a temporary bridge or using the future proposed Cherry Street crossing of the channel). Design aspects that need to be determined in discussion with TRCA, PortsToronto and other stakeholders regarding this crossing of Keating Channel include clearance requirements that may be needed for ongoing marine and maintenance activity in the channel;
- Bridge deck staging aspects associated with the west-end connection to the existing Gardiner structure at Bent #294. This is required to address traffic maintenance and lane reductions that will be required to complete the new bridge work at this location; and,
- Intersection layouts at cross roads.

9.1.3 Coordination with Other Infrastructure and Planning Projects

There are several infrastructure projects that are currently planned or in the planning stages in the immediate area of the proposed Gardiner works between the Don River and Cherry Street. Some of the elements of these plans are common to multiple projects and there is a need to coordinate construction activities to avoid conflicts. This includes City initiatives involving the Don River (as per the DMNP), planned works south of the Keating Channel (as per the Villiers Island Precinct Plan), implementation of the recommendations from the Don River and Central Waterfront Combined Sewer Outflow Project, and the ongoing Toronto Port Lands and South of Eastern TSMP. The coordination of the final planning recommendations, construction and implementation of all these plans is required on an ongoing basis. In addition, initiatives from other key area stakeholders will need to be considered and coordinated including those of Metrolinx, PortsToronto and private developers. Consultation activities completed throughout the EA included extensive coordination with stakeholders, agencies and project teams working in the study area as well as ongoing coordination with the Gardiner Expressway Strategic Rehabilitation team on implementation of Hybrid 3. This will need to continue during the detailed design and implementation planning stages through the various channels available to the City for coordinating large infrastructure projects. In addition, an inter-agency team has been formed to coordinate key Metrolinx, Gardiner Expressway, Port Lands and combined sewer overflow projects. The team includes representatives from the City of Toronto, Metrolinx, Infrastructure Ontario, and TRCA.

Keating Channel Precinct Plan and Keating Channel Precinct ESR Update

The Gardiner East EA results in a completely new alignment of the Gardiner Expressway through the Keating Channel Precinct. As such, there is an opportunity to design and implement a different local road network and block configuration in the Keating Channel Precinct than is currently approved in the Keating Channel Precinct Plan. Council authorized that the Keating Channel Precinct Plan be revisited based on the opportunities available due to the realignment of the Gardiner Expressway through this area. This will include consideration of new opportunities for public realm, pedestrian and cycling connections. A City staff report to Committee and Council is expected following MOECC approval of the Gardiner East EA.

Related to the above, the Keating Channel Precinct Plan work assessed long term utility requirements to support a relocated Lake Shore Boulevard and future development in the area. The location of Lake Shore Boulevard between the Don River and Cherry Street proposed in this EA is consistent with the roadway realignment proposed in the Lower Don Lands Infrastructure

EA and Keating Channel ESR. Servicing needs for the area as identified in the Precinct Plan recognized that most of the existing utilities were at or near the end of their service life and included the recommendation that implementing a series of utilidors could provide the best approach to future servicing.

The purpose of this additional work would be to develop a plan for the decommissioning of the bypassed Lake Shore Boulevard section, address utility conflicts and upgrading requirements, and future servicing needs leading to the development of an implementation strategy for the Keating Channel Precinct. This work requires coordination with the Don River and Central Waterfront Project which includes recommendations for servicing and stormwater management that would affect plans in this area.

9.1.4 Public Realm Implementation Strategy

Both the City of Toronto Official Plan and the Central Waterfront Secondary Plan provide policy direction for a high standard of public realm design within the study area, inclusive of (amongst others): the need for well-designed city streets, sidewalks and boulevards that act as public open spaces in their own right; recognition of a need to continually improve connectivity with the Lake Ontario shoreline as part of a comprehensive open space network; provision of new parks and open spaces that provide appropriate space and layout for recreational and community needs; and the creation of new city blocks and development lots at a size and configuration that promotes street-oriented development, and which allows for phased development.

In addition to these Council endorsed policies, the inclusion of "urban design" as one of four evaluation lenses used to evaluate alternative solutions and alternative designs, as well as the integration of an urban design study within the overall EA process, further reinforces the importance of the design and implementation of a high-quality public realm within the study area. City Council has also authorized a public realm implementation phasing and funding strategy for the Gardiner East corridor.

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

- Gardiner Strategic Rehabilitation Plan;
- Lower Yonge Precinct Plan;

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

Delivery of the proposed Gardiner East EA public realm improvements will be realized in concert with the many initiatives listed above. Based on the recommendations of the Gardiner East EA for public realm improvements along the Gardiner-Lake Shore Boulevard corridor, a public realm implementation strategy will be prepared to identify how proposed public realm improvements can best be coordinated with other waterfront and city-building initiatives. Given the overlapping implementation timeframes of various waterfront precinct and transportation planning initiatives, a phasing plan will be created as part of the implementation strategy. The implementation strategy will also consider the timeline and staging of construction for the Gardiner East EA road works in order to find opportunities to align construction planning so that initial public realm improvements can be in place when the Gardiner East reconfiguration is operational. The strategy will also review the coordination of other City programs related to traffic safety, cycling and pedestrian infrastructure, civic improvement and public art that may be implementing complementary projects within or proximate to the Gardiner East EA study area