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

Alternative Solutions Evaluation
INTERIM REPORT

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Table of Contents

1. INTRODUCTION 3
1.1 Interim Report Summary 4
1.2 Purpose of the Undertaking (Problem/Opportunity Statement) 4
1.2.1 Problems 4
1.2.2 Opportunities 5
1.3 Study Goals 6
1.4 Study Area 10
2. DESCRIPTION OF ALTERNATIVE SOLUTIONS 12
2.1 Context for the Undertaking 12
2.1.1 Existing and Future Conditions 14
2.1.2 Population and Employment Growth 14
2.2 Development of Alternative Solutions 17
2.2.1 Maintain Alternative 19
2.2.2 Improve Alternative 21
2.2.3 Replace Alternative 23
2.2.4 Remove Alternative 27
2.3 Understanding Transportation Choices and Case Studies 29
2.3.1 Creating a New Transportation Balance 30
2.3.2 Case Studies 31
3. EVALUATION APPROACH AND CRITERIA 34
3.1 Evaluation Criteria 34
3.2 Effects Assessment 37
3.3 Evaluation Approach 38
4. COMPARATIVE EVALUATION OF ALTERNATIVES 39
4.2 Criteria Group Ranking Rationale 39
4.2.1 Transportation and Infrastructure 50
4.2.2 Urban Design 55
4.2.3 Environment 59
4.2.4 Economics 62

4.3 Comparison of Alternatives 67
4.3.1 Criteria Group Preference Overview 68
4.3.2 Paired-Comparison Evaluation 70
5. CONCLUSION 75

List of Appendixes

Appendix A – 2009 Terms of Reference
Appendix B – 2009 Case Studies Report
Appendix C – PARAMICS Model Results Summary
Appendix D – Transportation Demand Management Paper
Appendix E – Construction Staging Summary
Appendix F – Air Quality Assessment Summary
Appendix G – Noise Assessment Summary
Appendix H – Economic Assessment Summary
Appendix I – Capital Cost and Net Present Value Estimate Summary

1. INTRODUCTION

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

Determining the future of the Gardiner East is a significant decision for the City: it requires reflection about the future of the City and its relationship with the waterfront. This project presents an opportunity for dramatic improvement in the urban design fabric of the City – an opportunity at a scale and with immediate benefit seldom possible in an established City. The Gardiner East EA is not just about road design, it is also about exploring the potential to create a new address that links the City with the waterfront. It is about finding a transportation solution that ties mobility to quality of life and placemaking. As the eastern waterfront gets shaped and energized with new plans, the window of opportunity to reconfigure the Gardiner is now. This EA study effectively integrates urban design objectives and mobility needs in the decision on how to address the deteriorated Gardiner Expressway East.

Through a competitive procurement process in 2008, Waterfront Toronto and the City hired Dillon Consulting Limited (Dillon) to lead an international team of engineers, planners, designers, economists and transportation consultants to complete the Gardiner East EA. The team includes Perkins+Will, Morrison Hershfield, Hargreaves Associates, and HR&A Advisors, with support from Sam Schwartz Engineering and Archaeological Services Inc.

The Gardiner East EA commenced in 2009 with the preparation of the Terms of Reference (ToR) for the study. The ToR set out the study process to be followed in conducting the Individual EA, including a description of how the public, stakeholders, Aboriginal communities, and agencies will be consulted throughout the EA. The ToR is available as **Appendix A** to this document and was approved by the Minister of the Environment in December 2009.

Studies and debates regarding the future of the Gardiner Expressway have been ongoing for over 20 years. The City is now at a point where a decision on the future of the Gardiner East is needed. The structure is over 60-years old and requires significant rehabilitation investment in order for it to continue to operate safely. This study is intended to identify a plan of action for the Gardiner East that can be fully coordinated with the rehabilitation of the structure west of the study area and with other waterfront revitalization efforts. A decision on the Gardiner Expressway and Lake Shore Blvd East is an important one that will influence development in the City's waterfront area for generations.

Background information related to the history and role that the Gardiner has played since its inception is provided in the ToR (**Appendix A**).

1.1 Interim Report Summary

This report has been prepared for the City and Waterfront Toronto as an interim report on the progress of the Gardiner East EA. Presented in this report are the alternative solutions that have been developed and the results of the assessment and evaluation of these alternatives. The evaluation considers the costs/impacts and the benefits/opportunities of the four alternative solutions: Maintain, Improve, Replace, and Remove. Descriptions of the alternative solutions are provided in Section 2.2. The approach to the evaluation of the alternatives is provided in Section 3 and the complete evaluation with results is provided in Section 4. Section 4 includes a detailed evaluation matrix (Table 2) presenting the data/effects by evaluation measure for each of the alternative solutions. As a result of the evaluation, the technically preferred alternative solution is Remove. A summary of the evaluation results is provided in Section 5, Conclusion.

1.2 Purpose of the Undertaking (Problem/Opportunity Statement)

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

1.2.1 Problems

Deteriorated Structure

The Gardiner Expressway East, from Lower Jarvis Street to east of the Don Valley Parkway (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.

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.

Disconnected Waterfront

The Gardiner Expressway and Lake Shore Blvd 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 Blvd also act as a psychological barrier with "dead space" located underneath it. Lake Shore Blvd 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 will address this gap.

1.2.2 Opportunities

Rebalance Transportation Modes

This project 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 a higher reliance on pedestrian, cycling, and transit (local and regional) modes. In the coming decades it is expected that the City will see a proportional decreased dependence on the private automobile and an increase in the use of active modes and transit. There is opportunity for the proposed solution to assist in achieving a more balanced transportation system for the City.

Revitalize the Waterfront

Reconfiguring the Gardiner Expressway and Lake Shore Blvd East presents opportunities to help re-shape the character of the urban environment, create new connections between existing City neighbourhoods and new waterfront districts, and make long-term quality infrastructure investments. 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.

Generate and Capture Economic Value

The Gardiner East EA presents opportunities for positive net value creation. 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.

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. Modifying the Gardiner Expressway and Lake Shore Blvd East and the surrounding development it catalyzes can be guided and evaluated by sustainable practices.

While environmental 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 the Toronto Region Conservation Authority (TRCA) have taken the lead in integrating many habitat and lake edge improvement projects along the waterfront. Among these is the *Don Mouth Naturalization and Port Lands Flood Protection* project. The Gardiner East EA provides a unique opportunity to support and build on these plans to create natural habitats around the study area.

1.3 Study Goals

Based on the problems and opportunities identified, the ToR established study goals for the EA. The goals were developed considering Waterfront Toronto's guiding principles, the City's *Official Plan* and *Central Waterfront Secondary Plan*, and public and stakeholder input. There are five goals for the Gardiner East EA:

Goal 1: Revitalize the Waterfront

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 along 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.

- 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.
- 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

The Gardiner Expressway and Lake Shore Blvd 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 East 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.

- Create physical, visual, and cognitive connections to the waterfront for downtown, the City, and region. The waterfront is an amenity that belongs 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.
- The new urban fabric should become a connector between the downtown and new waterfront communities, one that uses transit, street design and new mix use communities to stitch the city with its unique waterfront experience.

View of the Gardiner, City and waterfront looking east.

Goal 3: Balance Modes of Travel

Any new configuration of the Gardiner Expressway East 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”.

- Transportation initiatives are to be acknowledged 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 travelers. 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 Blvd East.
- Acknowledge and integrate other planned transit (local and regional) initiatives being proposed for the City.
- Consider a combination of supply, system and demand management measures. Creatively maximize the performance of infrastructure through management and operation.

Goal 4: Achieve Sustainability

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.
- Compliment 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/Riverside 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.
- Integrate ecology and natural systems with urbanism.

Goal 5: Create Value

The future reconfiguration of the Gardiner Expressway and Lake Shore Blvd East 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 Blvd East 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.

- 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. The public sector, through these city-building initiatives, creates value for the community, in terms of streets, open space, and catalysts for private development.
- Maximize net economic and environmental benefits

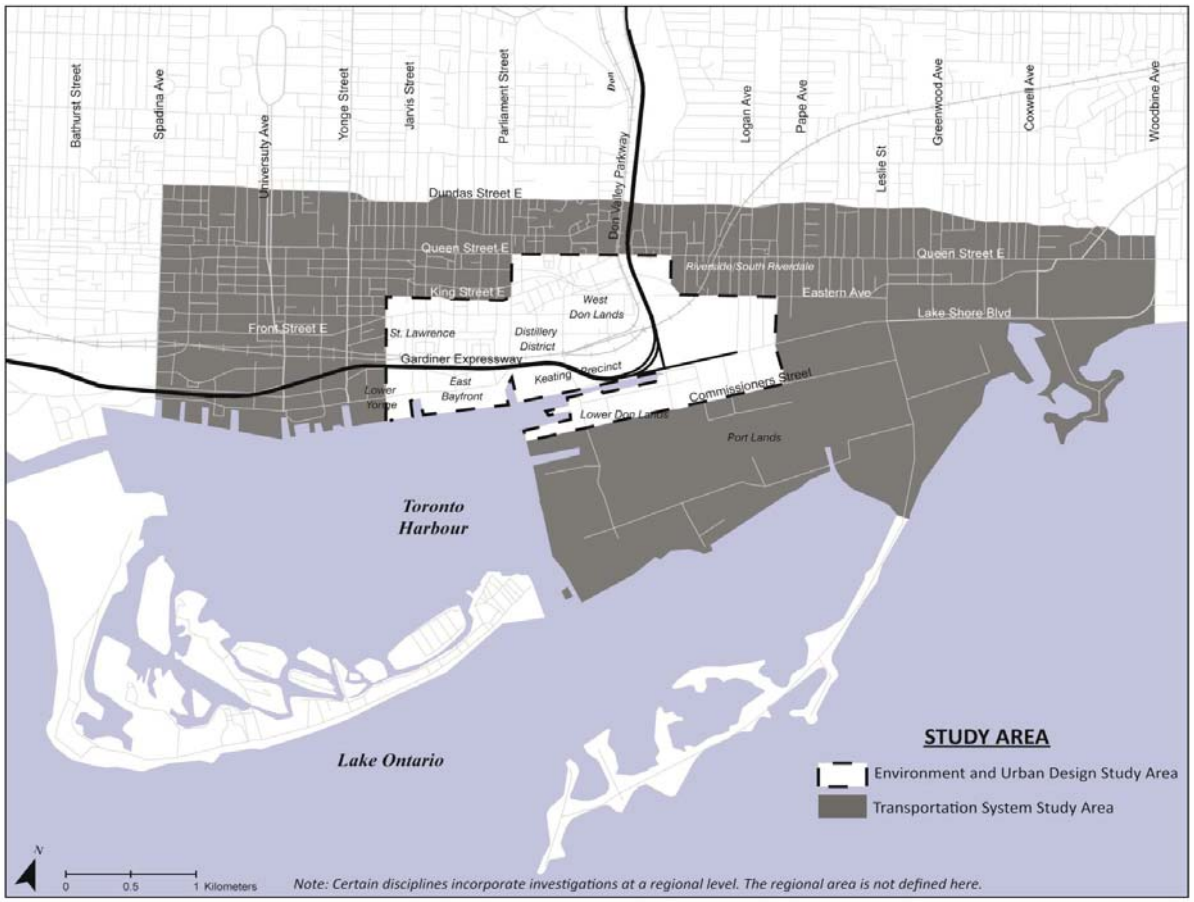
Waterfront Revitalization: George Brown College and Sugar Beach

1.4 Study Area

In 2009 the study area for the EA was defined in the ToR (see **Appendix A**) as the section of the Gardiner Expressway and Lake Shore Blvd East that extends 2.4 km from approximately Lower Jarvis Street to Logan Avenue. Since 2009 this study area has been revised to a slightly greater area in order to capture transition areas and the Richmond/Adelaide interchange with the DVP. The study area now extends from approximately Lower Jarvis Street to approximately Leslie Street. This study area is referred to as the Environmental and Urban Design Study Area. It includes the lands in the vicinity of the section of the Gardiner Expressway and Lake Shore Blvd East that are 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. **Figure 1** illustrates the study area. The study area includes five emerging waterfront neighbourhoods: Lower Yonge, East Bayfront, Keating, Port Lands and South Riverdale. North of the rail viaduct the study area also includes West Don Lands, Distillery District, Cork Town and the St. Lawrence neighbourhoods.

Certain disciplines incorporate investigations that study a wider area; this includes regional investigations for Transportation and Economics. In order to assess the impacts of the undertaking on the transportation system, the Transportation System Study Area, also shown in **Figure 1**, 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 have been included in the transportation assessment work for the EA.

Figure 1 – Environment and Urban Design Study Area & Transportation System Study Area



2. DESCRIPTION OF ALTERNATIVE SOLUTIONS

2.1 Context for the Undertaking

The Gardiner East EA study area is in a geography that is undergoing tremendous change. There are currently five new neighbourhoods being planned to serve growth to 2031: Lower Yonge, East Bayfront, West Don Lands, Keating, and the Port Lands. There are also some older well-established neighbourhoods in the study area that have a long history contributing to Toronto's character: St. Lawrence neighbourhood, Distillery District, Cork Town and Riverside/South Riverdale. These areas are also undergoing change with the rapid growth of Toronto. As all of these communities in the study area evolve, determining the future of the Gardiner East is critical to supporting the development of these areas. Planning for the Gardiner and Lake Shore pair is only one of many studies being undertaken to support growth in Toronto to 2031. Currently the City and Waterfront Toronto are undertaking fifteen studies in the downtown waterfront area. **Figure 2** illustrates the studies and plans underway. The Gardiner East EA is being coordinated with these studies and plans.

Figure 2 – Downtown-Waterfront Studies Concurrent with Gardiner East EA

1. Gardiner Expressway and Lake Shore Boulevard East EA
2. Downtown Transportation Operations Study
3. Richmond-Adelaide Cycle Track Study
4. York-Bay-Yonge Ramp EA
5. East Bayfront Transit Strategy Study
6. Lower Yonge Precinct Transportation Master Plan Study
7. Cousins Quay Precinct Plan
8. Film Studio Precinct Plan
9. Lower Don Lands and Don Mouth Revitalization EA
10. Port Lands and South of Eastern Avenue Transportation and Servicing Master Plan
11. Gardiner Expressway Rehabilitation Study
12. Rapid Transit Expansion Study
13. First Gulf Application Review
14. Billy Bishop Airport Strategic Transportation Strategy
15. Downtown Relief Line – East Study

2.1.1 Existing and Future Conditions

Existing conditions (2013) and future conditions (2031) in the study area have been considered in the development and assessment of the alternative solutions. 2031 was selected as the future horizon year as with a 2020 construction start; the preferred alternative will be operating for several years by 2031 thus allowing the transportation system to adjust.

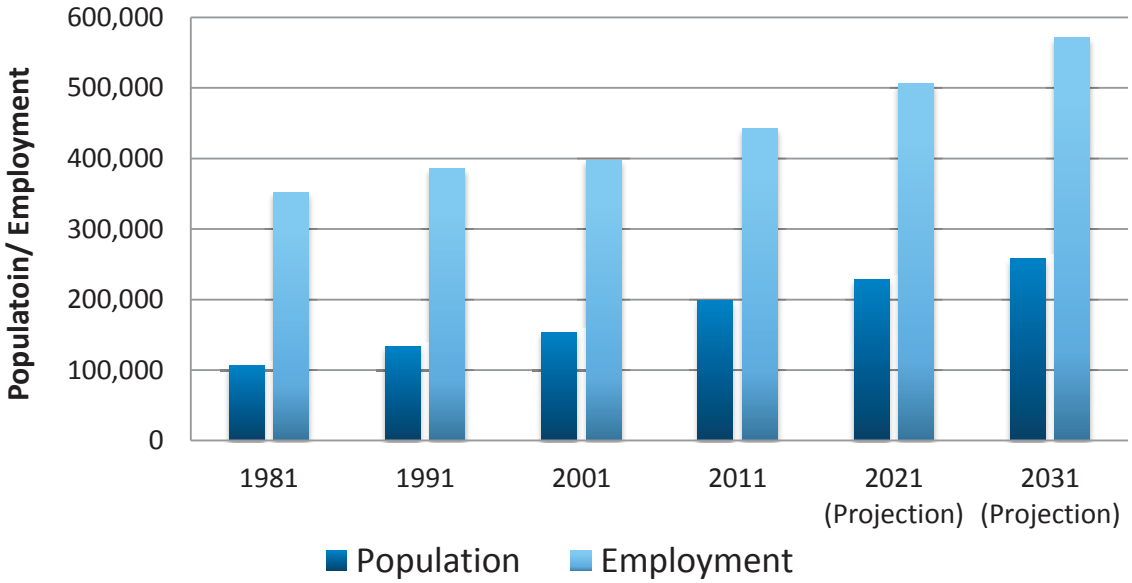
Further, it was assumed that for the 2031 horizon year, all approved development in the study area would be in place as per currently approved development plans including waterfront precinct plans and approved development applications. It is recognized that based on current absorption rates it is unlikely that all of this development will be achieved by 2031. A 2031 build-out date has been used for this study to be consistent with current plans and to assess the effects of the undertaking on the full development plans for the area, whether they are achieved by 2031 or later. The potential construction effects of the undertaking have been assessed on the basis of existing (2013) conditions although consideration was also given to future developments the study area as per the City approved precinct plans.

2.1.2 Population and Employment Growth

To develop and assess the alternative solutions, this study considers how transportation infrastructure is used today and how it may be used in the future. Population and employment growth, as well as the travel behaviour of commuters, forms a basis for identifying and evaluating transportation options.

Providing context for the development and assessment of the alternative solutions, **Figure 3** provides the population and employment growth for Downtown Toronto since 1981. Consistent growth has been experienced for both population and employment. Recent trends and plans for continued residential development illustrate that there is a growing number of people living downtown. Development of waterfront precincts in the study area contributes significantly to the projected 2031 growth.

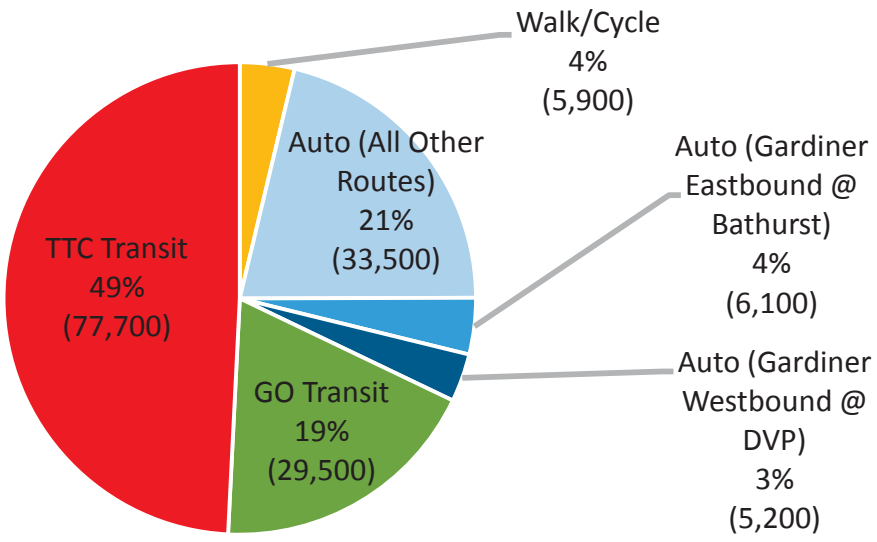
Figure 3 – Downtown Toronto Population and Employment Growth 1981-2031



Source: Downtown Employment/ Population: 1) Census Canada (1981-2011); and 2) Employment/ Population City's Flash Forward Report (2011-2031). Downtown: Defined as Bathurst to Don River and Waterfront to the rail corridor north of Bloor

Figure 4 provides the current make-up of commuters who access the Downtown during the AM peak by mode. The existing condition shows that of 157,200 commuters per peak hour coming into the Downtown, 68% of those are via transit (49% TTC and 19% GO Transit) while 28% are via automobile. Of the 28% auto, 7% of those use the Gardiner Expressway between Bathurst and the DVP.

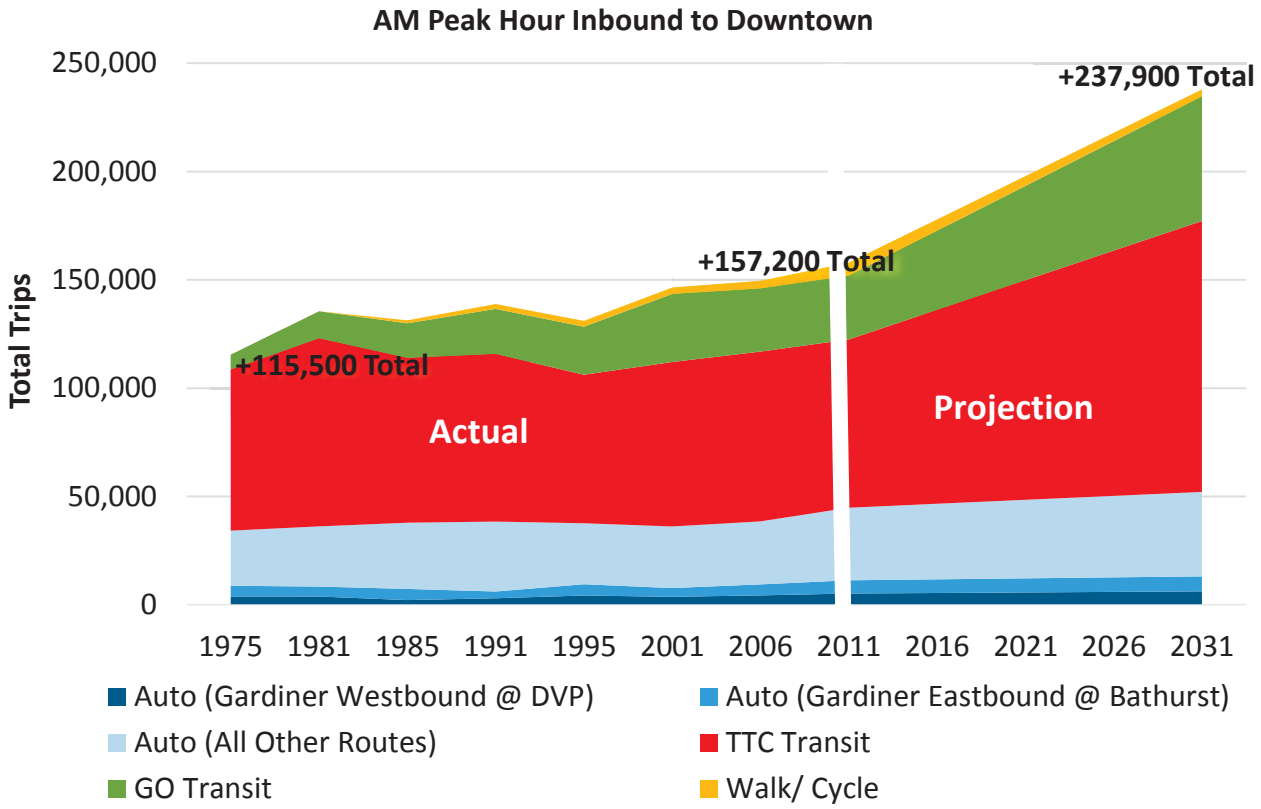
Figure 4 – How Commuters Get Downtown (AM Peak Hour 2011)



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

Recent growth in transportation demand to access the downtown has largely been accommodated by transit. **Figure 5** shows the growth in transportation demand for people travelling into the Downtown in the AM peak hour. This considers the use of the Gardiner East. What is evident from the figure is that TTC and GO Transit have been increasing in use and will be the primary modes to serve transportation demand growth through to 2031. This is consistent with the existing condition shown in **Figure 4** with the majority of people on transit.

Figure 5 – Transportation Demand Growth 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; Downtown: Defined as Bathurst to Don River and Waterfront to the rail corridor north of Bloor

The existing and future conditions including population, employment, and transportation trends in the study area provide the context for which the alternative solutions for the Gardiner East EA have been developed.

2.2 Development of Alternative Solutions

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; Remove the elevated expressway and build a new boulevard.

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. Teams that participated in the Design Ideas exhibition focused on three of the alternatives: Improve, Replace and Remove. A team was not assigned to the "Maintain" alternative. Maintain, also known as "Do Nothing" under the EA regulations, is the baseline case for the future of the Gardiner East. This includes the rehabilitation of the expressway structure as per the City's 2013 Gardiner Rehabilitation Project and includes the approved precinct plans for the study area.

In June 13, 2013 the Design Ideas from the international teams 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 thought 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.

Gardiner East EA Public Meeting at Metro Toronto Convention Centre, June 13, 2013

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 life cycle 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. 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 Council, more detailed alternative designs are generated for the preferred solution to explore the opportunities of the solution.

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 Blvd entirely under the expressway was too expensive for the limited benefits it achieved;
- For Replace, the improved environment along Lake Shore Blvd 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.

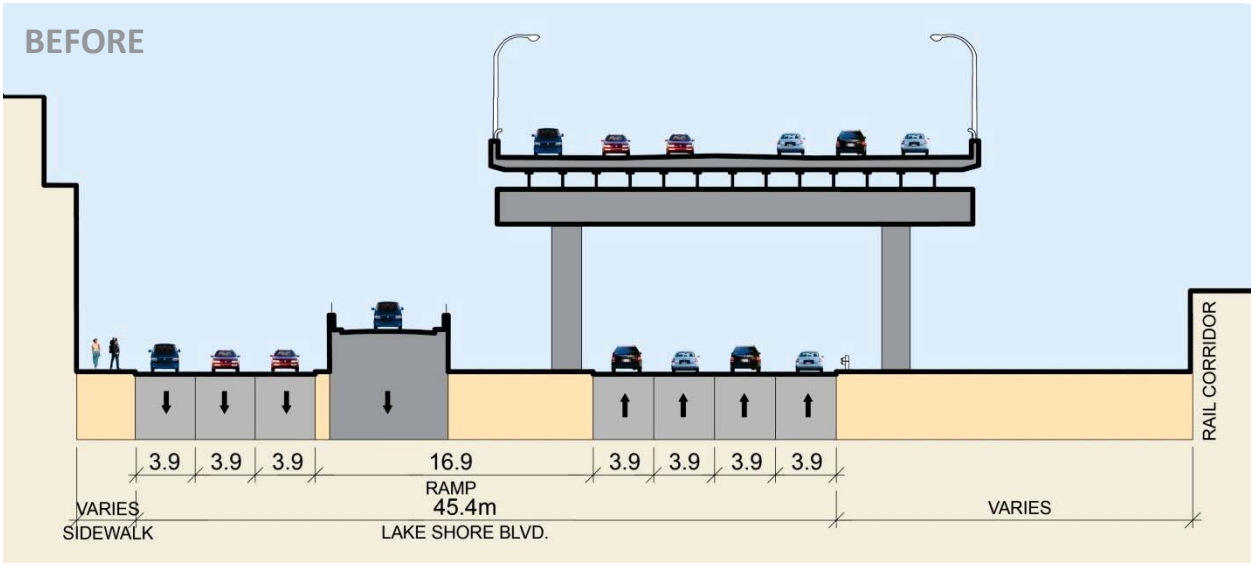
As a result of the public input received at the October 2013 public meeting, revisions were made to the Improve and Remove alternatives. These revisions, along with the evaluation results, were presented to the public at the February 6, 2014 public meeting. The following sub-sections provide a summary of the final alternative solutions developed from input through the Design Ideas, stakeholder meetings, technical advisory meetings and public input. These are the solutions that have been assessed and evaluated.

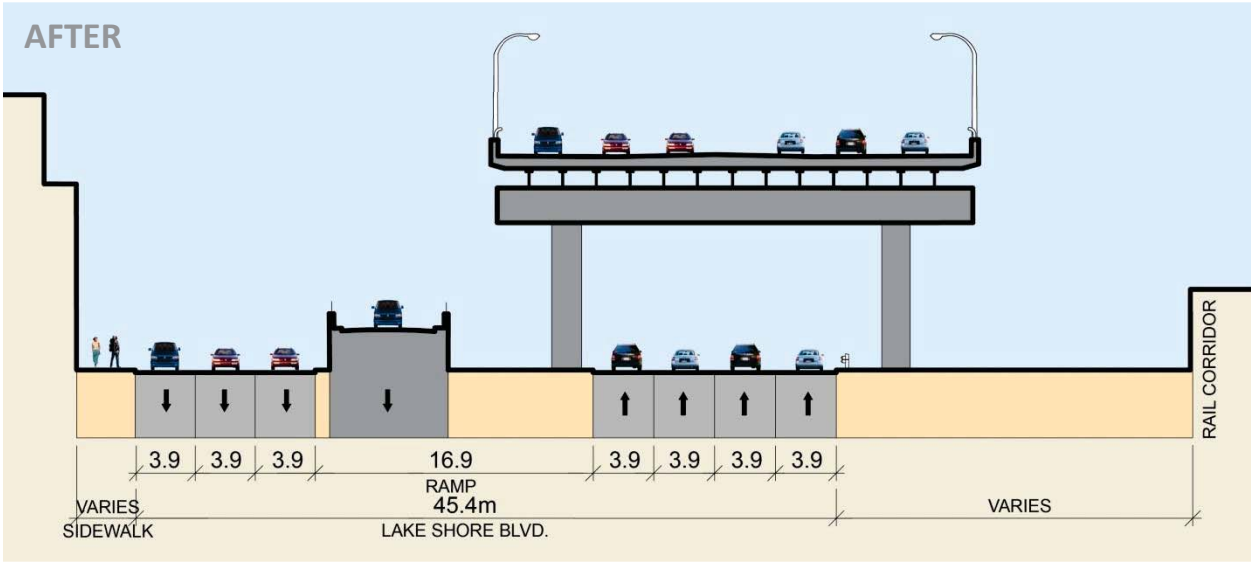
2.2.1 Maintain Alternative

Maintain the elevated expressway includes the completion of the 2013 Gardiner East rehabilitation program. This includes complete reconstruction of the deck of the expressway. Maintain also includes implementation of the precinct plans as they are approved today. This includes the realignment of Lake Shore Blvd through the Keating Precinct between Cherry Street and the Don Roadway. The realignment of Lake Shore Blvd 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. The Keating Precinct Plan was approved by Council in 2010.

Maintain

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





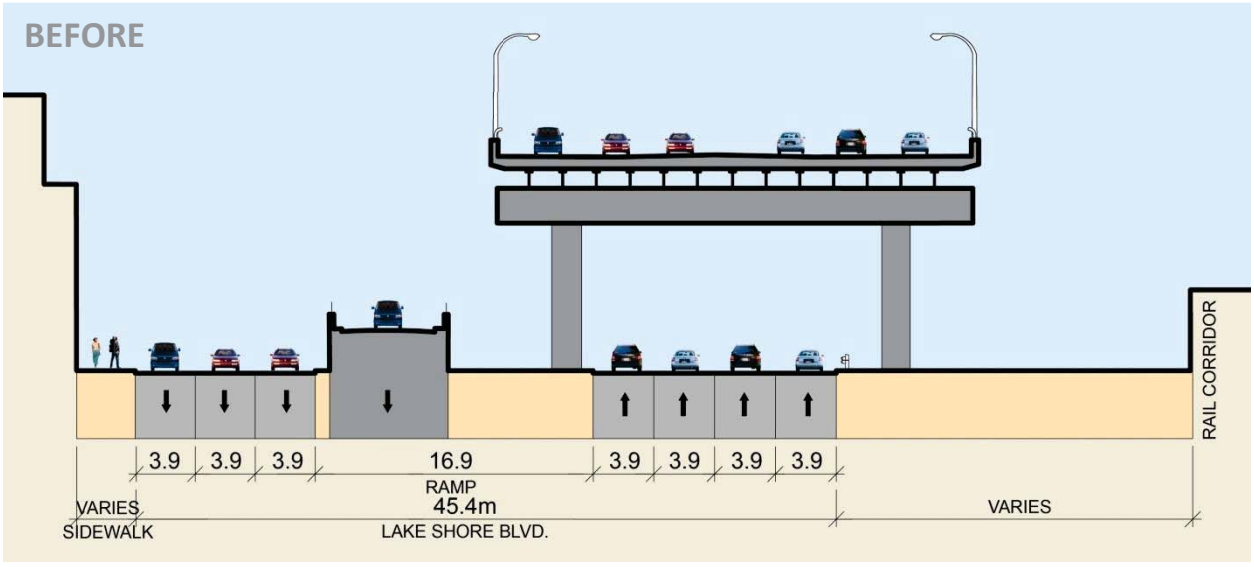
2.2.2 Improve Alternative

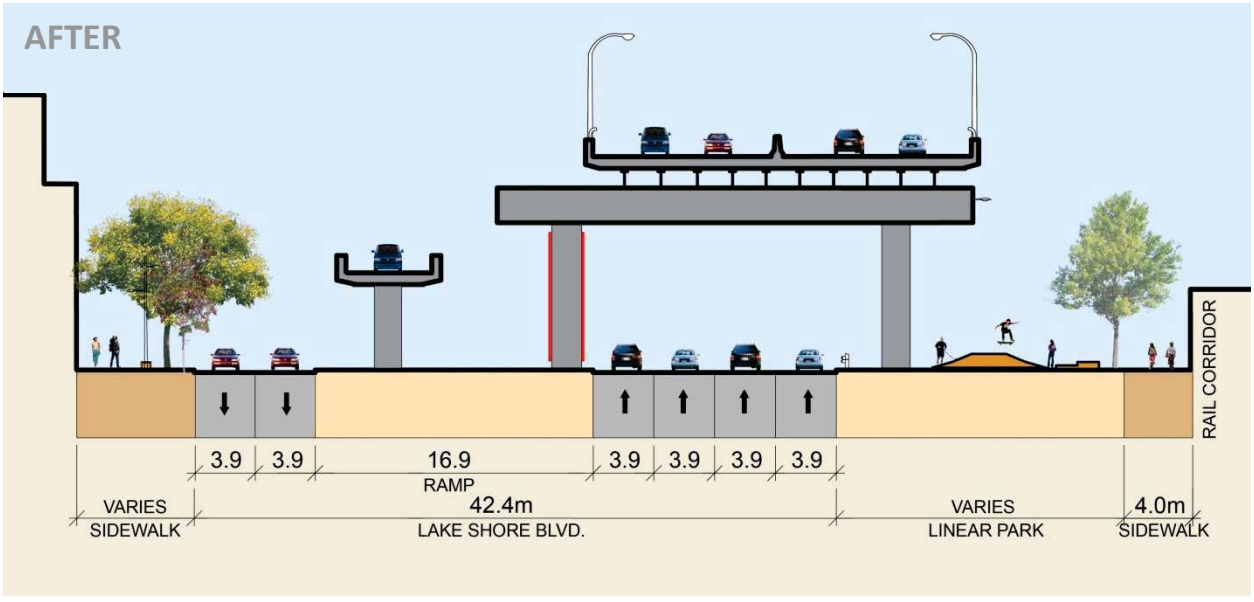
Improve the urban fabric while maintaining the existing infrastructure involves the following elements:

- Rebuilding the expressway deck with four lanes. The four lanes would be on the north side of the deck 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 Blvd 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 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 Blvd. 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 Blvd 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 Blvd 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 Blvd through the Keating Precinct between Cherry Street and the Don Roadway would be completed as per the approved Keating Precinct Plan. This is consistent with the Maintain solution.

Improve

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





2.2.3 Replace Alternative

Replace 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 for Replace, preliminary investigation was completed to identify the benefits and challenges of these options.

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. 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 for the 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 Blvd East corridor. New land would be opened up that would transform the ground level experience of the corridor as a whole. With Gardiner through-traffic functions placed below grade and only Lake Shore Blvd at ground level, new public land would become available allowing enhanced connections between the city and the waterfront. It would transform Lake Shore Blvd 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 Blvd 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 mid-section 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 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 limit 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

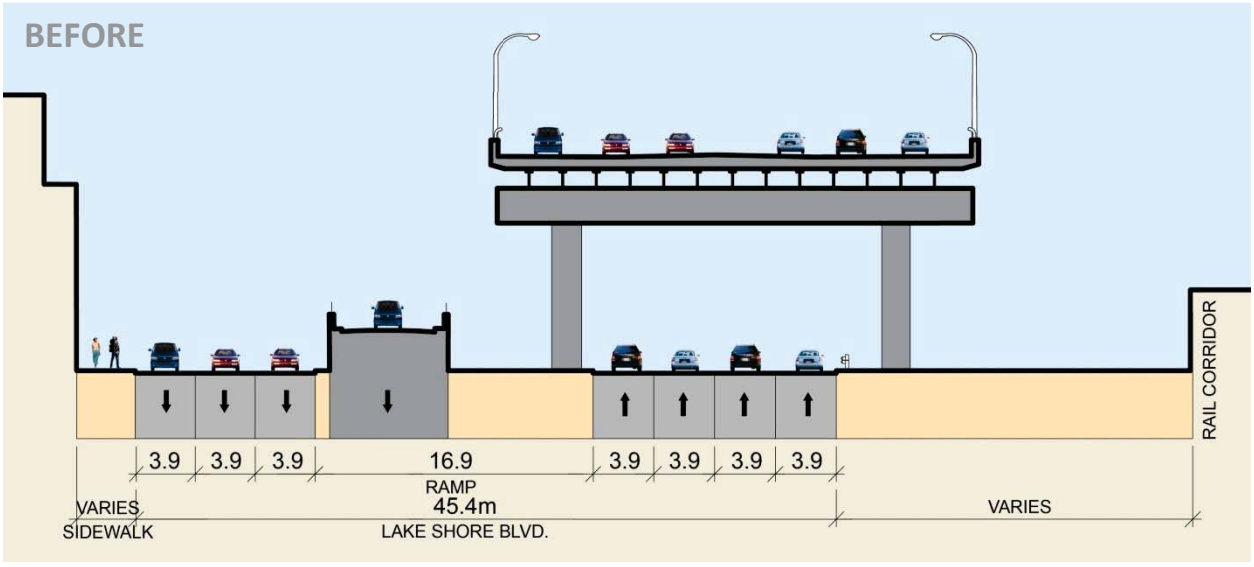
Replace the existing expressway with a new elevated structure was developed and carried forward as the alternative solution for Replace. A new elevated structure is technically achievable and more feasible that a tunnel.

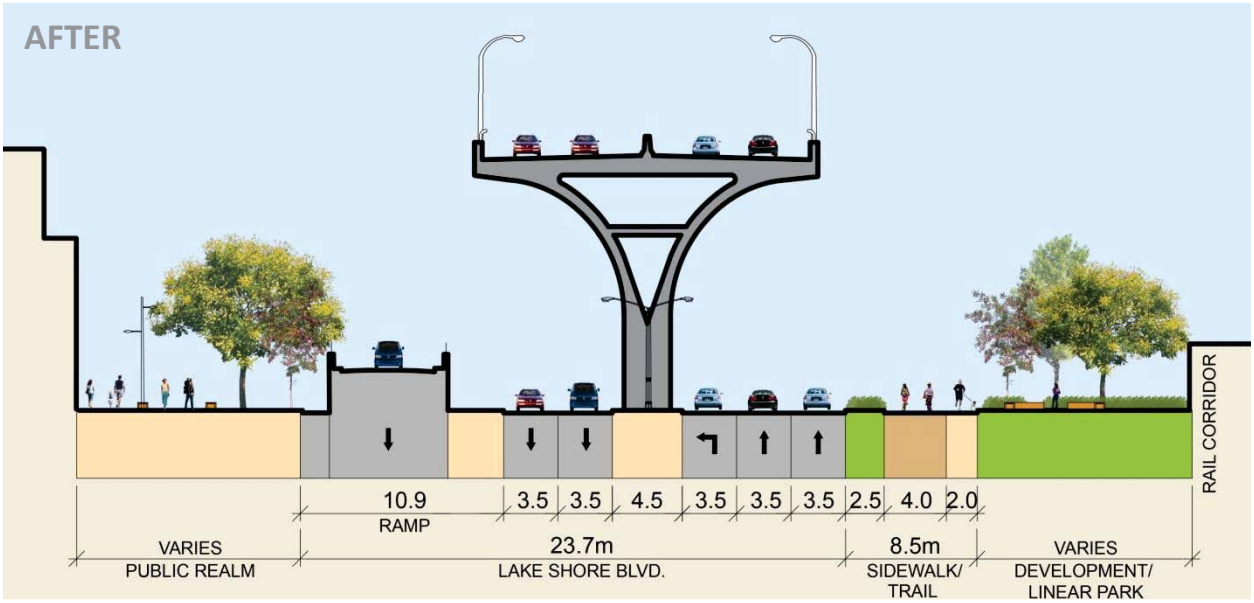
Replace with a new elevated structure includes:

- Construction of a new 4-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 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 Blvd.
- New ramp connections would be built to provide the Jarvis/Sherbourne connections.
- Lake Shore Blvd would be rebuilt as a 4-lane boulevard situated underneath the new elevated expressway.
- Development parcels along the south edge of Lake Shore Blvd would be expanded and opportunities for new parks and public spaces would be created between the rail corridor and the north side of Lake Shore Blvd.
- A new east-west continuous bicycle path would be developed on the north side of Lake Shore Blvd.

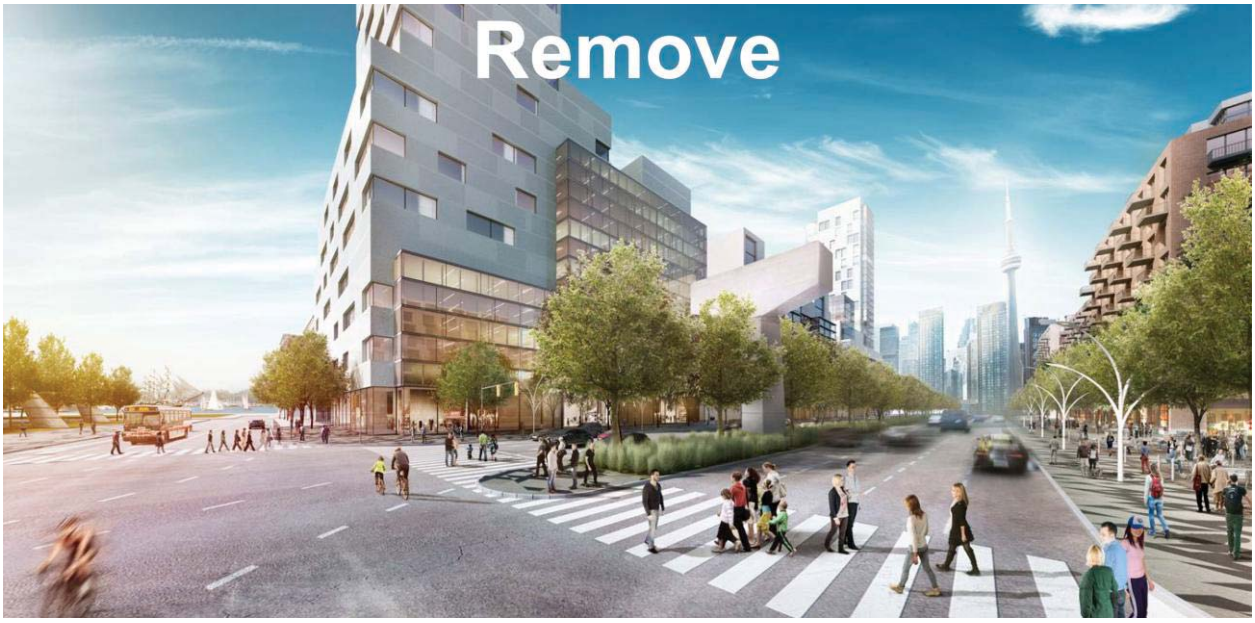
Replace

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





2.2.4 Remove Alternative

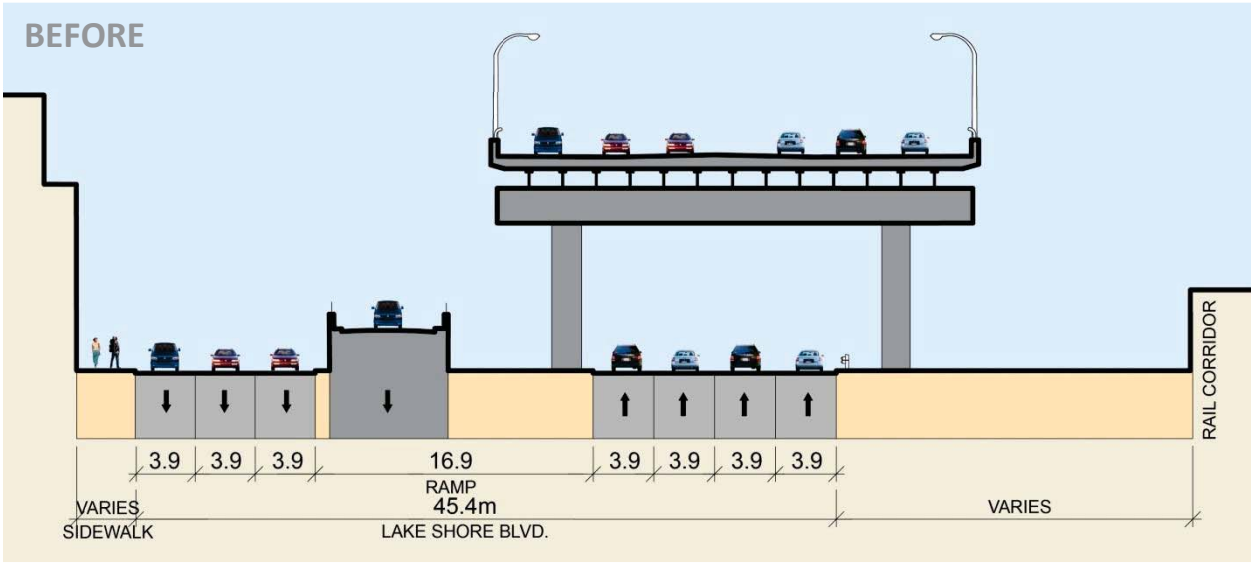


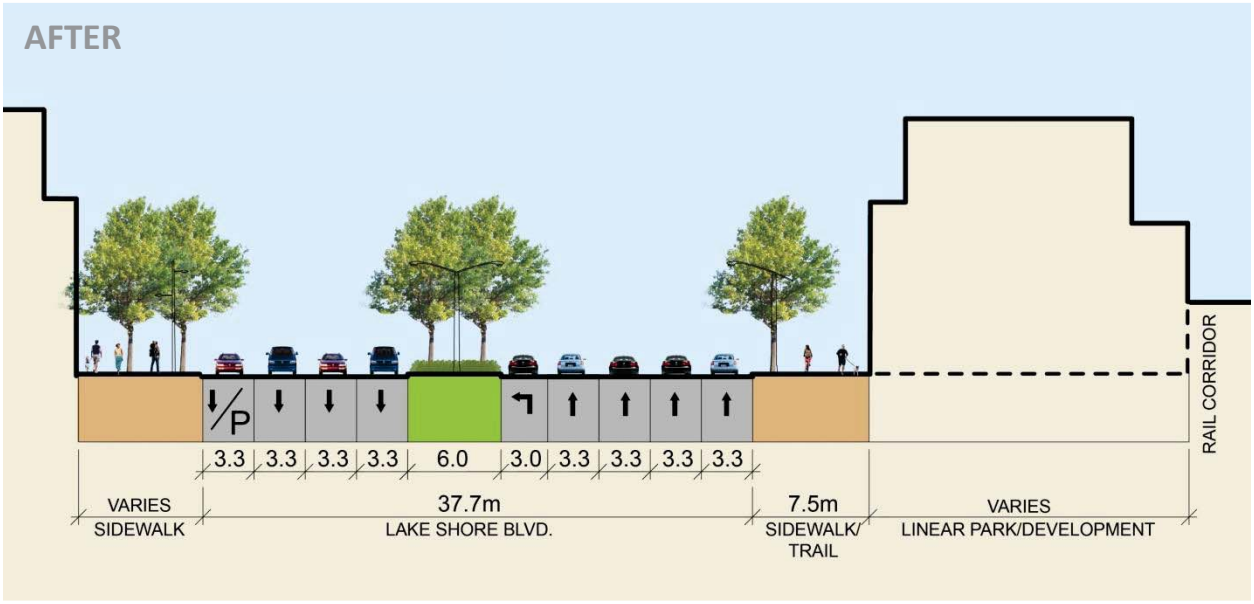
The Remove alternative solution involved the demolition of the existing Gardiner Expressway east of Jarvis Street and the construction of a new 8-lane boulevard with potential for new development on both the north and south sides of the street. The Remove alternative would open up the corridor to light and air and would allow for a boulevard planted with 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.

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 Blvd. 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 Blvd.

Remove

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





2.3 Understanding Transportation Choices and Case Studies

Over the past three decades there has been a substantial growth of activity in Downtown Toronto (Bathurst to Don River and Waterfront to the rail corridor north of Bloor). Employment has grown by approximately 25% and population by nearly 90%. Combined, there were 40% more jobs and residents located in the Downtown in 2011 than 1981. Associated with this growth, the number of person-trips entering Downtown in the 3-hour AM peak has also grown at a similar but slightly slower rate (36%). Despite this substantial growth in activity (180,000 more jobs and people) and travel (42,000 more trips to Downtown), the historical record shows little to no significant growth in number of automobiles entering Downtown Toronto over this 35-year period.

The lack of substantial growth in traffic volumes during peak commute periods over such a long time period in which major job and population growth occurred suggests that there is a fairly stable balancing point between the demand for driving to Downtown and the available supply of road space for these trips. It is often suggested that if the number of drivers trying to enter Downtown substantially increases, then travel times will also increase as road congestion worsens. However, such potential increases in driving times would also make driving a less attractive choice for some individuals, and so, these individuals would choose not to drive during peak periods and thereby help dampen increases in travel times and alleviate congestion. The ultimate outcome depends on the relative strength of these two opposing forces. In the case of Downtown Toronto, the 35-year historical record suggests that these two forces are well balanced.

Aggregate data on traffic volumes can overlook the detail that these traffic counts represent thousands of individuals who make up a cohort of people who are driving. Though traffic volumes to Downtown Toronto have remained stable over time, the cohort of drivers today is made up of different individuals than in the past. In fact, the cohort of individuals is constantly changing as people experience life events such as entering the workforce, migration, changing jobs, and retirement. In the long run, these changes and decisions on the individual level have created a balance at the social level. New individuals have been choosing to drive at the same rate as existing ones choose to no longer drive -- if not for this balance, traffic volumes would have grown substantially. This is not a totally surprising outcome. Growth in activity Downtown was accompanied by a substantial growth in public transit trips to access Downtown, more walking and biking trips, and a lower rate of trips entering Downtown for each job located Downtown (more people choosing to both live and work in Downtown). However, there have been few significant changes to the capacity of the City's street system over this period of growth. With little change in the capacity and the options available to drive Downtown, there has also been little change in the total number of individuals choosing to drive Downtown -- despite the fact that the percentage of individuals choosing to drive has decreased when compared against growing numbers of people using public transit and walking/biking.

2.3.1 Creating a New Transportation Balance

Three of the alternatives being examined in this EA study consider a change to the option of driving to Downtown, and therefore may potentially alter the long-term balance between the availability of road space and the amount of traffic. Reconfiguring the Gardiner East as an at-grade boulevard can open opportunities to achieve many objectives such as connecting the city to the waterfront, however, the potential impacts on mobility and travel times for motor vehicles is of interest to many.

The ultimate traffic impacts of a potential reduction in the traffic capacity of the Gardiner East corridor will depend on how thousands of individuals react to this change in terms of their decisions about travel, home location choice, and job location choice. This EA undertook a transportation demand modeling and traffic simulation exercise to attempt to forecast these responses in the future year 2031. The models used are built on the basis of collecting data on people's existing travel choices, and attempting to estimate future outcomes in different scenarios. However, data on existing transportation choices reflect individual decisions that are based in current realities. A major transformation of the Gardiner East corridor has the potential to also create a substantially different reality that may trigger choices that do not exactly follow existing trends.

Over the past three decades, fairly stable traffic volumes entering Downtown have been possible. There has been an overall balance in the rate at which additional individuals choose to drive Downtown and the rate at which individuals no longer choose to drive Downtown. The reality of 2031 travel patterns will not develop overnight; they will form over the next 15 years. As such, a major transformation of the Gardiner Expressway presents an opportunity to gradually trigger and enable a different relationship between the ebb and flow of individuals entering and exiting the cohort of people who choose to drive.

With construction periods ranging from six to eight years, all of the four alternatives being considered in the EA involve restrictions and modifications to traffic flow in the Gardiner East corridor. During this period of construction, it is likely that individuals will choose to enter the cohort of drivers at a slower rate than historically and that individuals will also leave the cohort of drivers at a faster rate. Consequently, a future corridor design that has lower vehicle capacity than the current Gardiner Expressway may perform with fewer traffic impacts than one may intuitively expect as society moves toward a different pattern of choices among travel modes and therefore is able to balance traffic volumes and road space.

The transportation modeling undertaken for the EA is limited in its ability to gauge these types of potential shifts since the underlying data about existing choices are limited in their power to illuminate how decisions may change under changing circumstances that people have not yet experienced. Therefore, examining case studies of places that have implemented similar projects is another important source of data to understand potential impacts and adaptations.

2.3.2 Case Studies

At the commencement of this EA the project team examined case studies from around the world to understand what other cities have done with their elevated highway infrastructure when faced with the question of whether to maintain the infrastructure or alter it. These case studies were prepared as a tool for public engagement; to generate an understanding of the issues that would be studied as part of the EA. **Appendix B** includes a copy of the March 2009 Case Studies report. Case studies collected included examples of cities that decided to Maintain, Improve, Replace and Remove their elevated expressways.

New York, Boston, Washington and San Francisco are examples of cities that have successfully addressed the challenges of aging elevated expressway systems by altering them. In each case, changes to such systems have proven to be a catalyst for revitalizing neighbourhoods, enhancing the public realm, and stimulating the city's economy. These case studies and others around the world demonstrate the opportunities afforded by the re-design of single-use pieces of infrastructure into urban elements that provide broader public benefits.

Given the technically preferred alternative solution that is being presented in this interim report, a short description of Remove type case studies is provided below. Details of other case studies for all alternatives can be found in Appendix B.

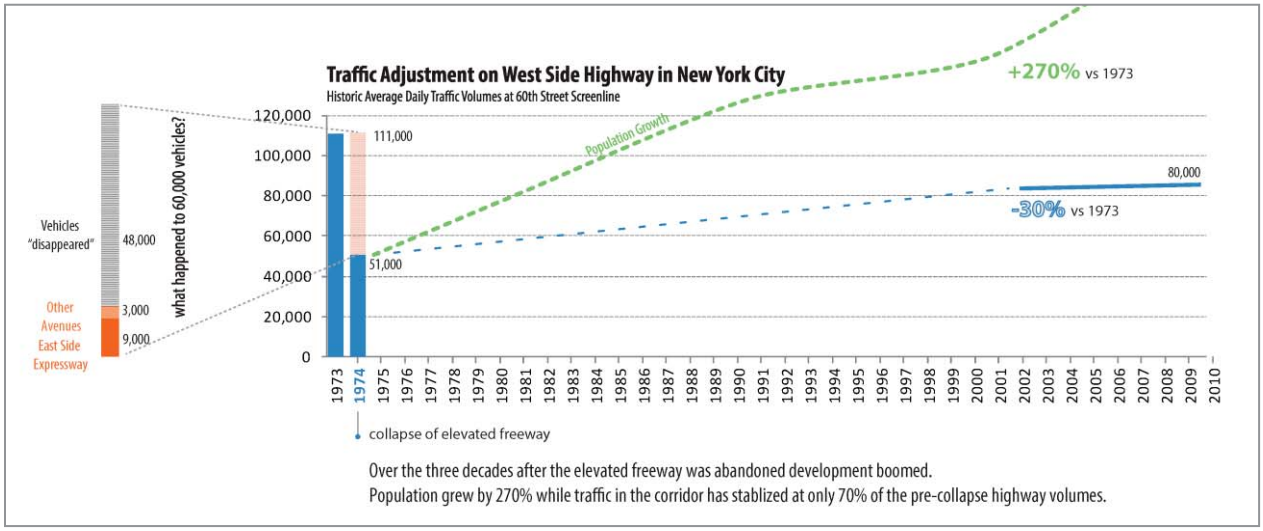
Case studies of Chicago and New York suggest that there is an opportunity for cities to remove an elevated highway from the downtown area or to not have one altogether without experiencing adverse economic or traffic impacts.

Pedestrian crossing of West Side Highway (expressway removed), New York City

New York City

In 1973, a section of the elevated West Side Highway in Manhattan collapsed without warning, prompting the immediate closure of a 6 km segment of the facility. Just prior to the collapse, 111,000 vehicles per day traveled the West Side Highway. Traffic counts conducted one year after the collapse demonstrated only 51,000 vehicles per day continued to use the surface street below the highway and 12,000 vehicles were diverted to parallel routes. The remaining 48,000 vehicles (43%) previously using the elevated highway could not be found and had 'evaporated' from the street network. This reduction in traffic related to the freeway collapse has remained a long-term trend and the interim surface road below the former elevated freeway was replaced in the 1990s with a 6-lane urban boulevard and adjacent multi-use path.

Population along the West Side Highway corridor has grown 270% since 1973 despite the lack of any substantial investments to public transportation infrastructure (including rail and bus transit) in this part of the city. Automobile traffic in the corridor today remains 30% below pre-collapse volumes: approximately 80,000 vehicles per day.

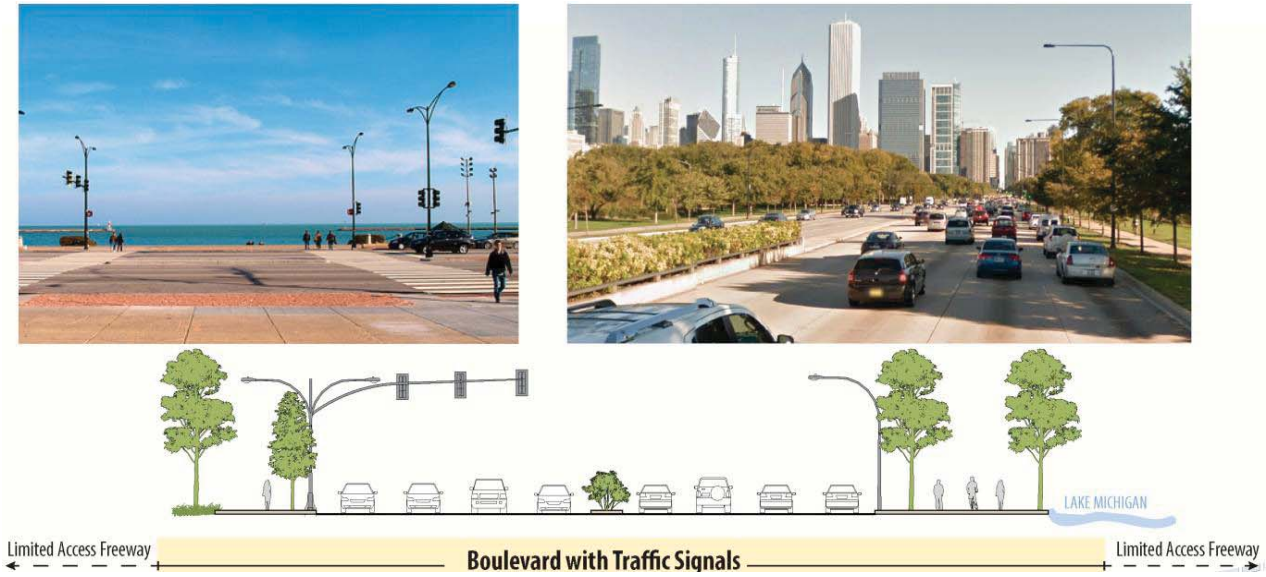


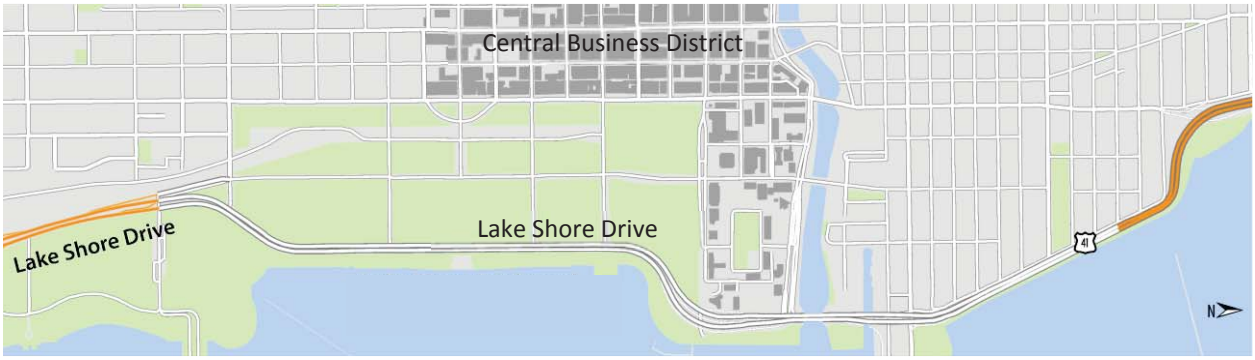
Chicago

Unlike most cities in the United States, freeways never passed through Chicago's downtown business district (known as 'The Loop'). Instead, high-capacity boulevards connect multiple points in the city's local street network with the regional highway system. As it approaches downtown, Chicago's Lake Shore Drive is a limited-access highway similar to the Gardiner Expressway on either side of Chicago's downtown and provides access to regional destinations such as the convention center and the city's largest sports stadium. However, for a 3 km segment within the downtown, Lake Shore Drive transitions into a surface boulevard. The boulevard is a major spine of the city's waterfront parks along its Lake Michigan shoreline and preserves direct sightlines to the water. Despite carrying about 100,000 vehicles per day, Lake Shore Drive is designed with traffic signals (including one signal exclusively for pedestrians)

spaced on average every 300 meters. These crossings give pedestrians and bicycles at-grade access to the city's lakefront trail.

This multi-modal design of Lake Shore Drive helps enable choice and adaptability. Even after adjusting for the effects of new construction in The Loop and changes in employment related to the global economic slowdown, between 2000 and 2010, the total number of vehicles entering the Loop decreased by 12%.





Top Left: View of Lake Michigan directly looking across Lake Shore Drive, Chicago
Top Right: Landscaped Lake Shore Drive, Chicago
Centre: Cross section of Lake Shore Drive, Chicago
Bottom: Map of Chicago waterfront, CBD and Lake Shore Drive. No expressway access to the CBD

3. EVALUATION APPROACH AND CRITERIA

3.1 Evaluation Criteria

The assessment and evaluation of the alternatives 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 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. The completed evaluation matrix presented in Section 4.0 outlines the measures that were considered.

Table 1 - Evaluation Criteria Groups and Criteria

Study Lens/ Criteria Group	Criteria	Definition
TRANSPORTATION and 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 (O-D) pairs.

Study Lens/ Criteria Group	Criteria	Definition
	Impact on Average Auto Travel Time (AM peak 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 and south of Dundas Street.
	Road Network Flexibility/ Choice	Number of available road network connections that provide drivers with the ability to alter their routes.
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, quantity and condition of pedestrian connections crossing Lake Shore Blvd. Walking distance across Lake Shore Blvd at major north-south streets (e.g. Jarvis Street).
	East-West Sidewalks	Extent, quantity and condition of pedestrian connections along Lake Shore Blvd.
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 Blvd (number of lanes to cross).
	Safety Risk for Pedestrians and Cyclist	Extent to which pedestrians and 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.
	Safety Risk for Cyclists and Motorists	Extent to which there are road safety concerns for cyclists. Includes poor sightlines and intersection turns that cross cycling facilities without controlled traffic lights.
	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.
	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 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 *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 Precinct Plans are accommodated and supported.
Public Realm	Streetscape	Quality and consistency of a cohesive street design and character along Lake Shore Blvd. Considers the balance between hardscape (e.g. paved road surface) and softscape (e.g. landscape, open space, etc).
	View Corridors	Visual sightlines 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 Blvd.
Built Form	Street Frontage	Relationship between development and Lake Shore Blvd at the pedestrian scale. This includes the active at-grade uses in buildings fronting onto Lake Shore Blvd 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 and Shaded Street	Amount of trees that can grow in the corridor and the percent of tree canopy coverage possible.
Cultural	Built Heritage	Potential for impact on historic physical architecture and cultural property that is inherited and maintained within

Study Lens/ Criteria Group	Criteria	Definition
Resources		the corridor.
	Cultural Landscape	Potential for impact on the existence of a built or natural landscape that is valued by people for its religious, artistic or cultural associations within the corridor.
	Archaeology	Potential for impact on known buried resources or artifacts within the corridor.
	First Nation 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 Blvd.
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 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.

3.2 Effects Assessment

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 previously noted. Qualitative and quantitative data were collected and considered.

Much of the lands adjacent to the Gardiner/Lake Shore Blvd East corridor are in transition. Based on current City Precinct Plans, these former industrial lands are to be transformed from their current vacant/underutilized state, to commercial/residential uses. The potential for both construction and operation effects 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. It was assumed that the East Bayfront, Keating and Port Lands precincts 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, the effects assessment work is considered to be conservative.

3.3 Evaluation Approach

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. As such, when comparing among 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 a further description of this process.

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.

4. COMPARATIVE EVALUATION OF ALTERNATIVES

The following section presents the results of the assessment and evaluation of the four alternatives. **Table 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.

4.2 Criteria Group Ranking Rationale

This section provides the rationale for the preference rankings of the alternatives for each of the 16 criteria groups as presented in **Table 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 2 – Alternative Solutions Evaluation Matrix

Preference Ranking Colour Code

Preferred	Moderately Preferred	Less Preferred

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 analysis above.	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)
		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 *Existing* *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**

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
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 community and travelers.	**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 Blvd.	
		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 Blvd (linear metres)	*(W = westside crossing, E = eastside crossing)*			
		Jarvis St	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 St	48.3m W, 41.4m E	41.8m W, 51.1m E	23.7m W and E	37.5m W and E
		Parliament St	29m W, 29.2m E	25.3m W, 26m E	25.5m W, 25.1m E	38.5m W, 38.9m E
		Cherry St	33.5m W, 31.4m E	28.7m W, 20.3m E	25.3m W, 22.4m E	39m W, 36.2m E
		Don Rd	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 St	Not possible	Not possible	25.8m W and E	25.8m W and E
		Logan Ave	Not possible	Not possible	26.9m W, 27.8m E	26.9m W, 27.8m E
		Carlaw Ave	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 length along the corridor for use by the local community and travelers.	**Less Preferred –** Existing sidewalks are sub-standard and or not existing in parts of the corridor. Improvements not budgeted under rehabilitation program. Re-alignment of Lake Shore Blvd in Keating allows for sidewalks on both the north and south side for all options. 1,500 total linear metres	**Moderately Preferred –** Sidewalk on the north side of Lake Shore Blvd are not possible between Yonge and Parliament St due to physical limitations of on/ off ramps. 4,000 total linear metres.	**Preferred -** Reconstruction of the corridor allows for sidewalks to be built to City standards along the entire length of Lake Shore Blvd for use by both the local community and travelers on the north and south sides of Lake Shore Blvd. 4,400 total linear metres.	
		Pedestrians Summary Ranking	**Less Preferred**	**Moderately Preferred**	**Preferred**	

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
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 St and Yonge St.	**Moderately Preferred** – Physical limitations between Yonge St and Jarvis St. Total length of existing and proposed facility is 3,690 m in length between Leslie St and Yonge St.	**Preferred** – Total length of existing and proposed facility is 4,200 m in length between Leslie St to Yonge St.	
		Connectivity with other bikeway facilities *Existing cycling facilities* • *Yonge Street* • *Sherbourne Street* • *Martin Goodman Trail (east of Parliament)* *Planned cycling facilities* • *Trinity Street* • *Cherry Street*	**Less Preferred –** Includes no new cycling facility	**Moderately Preferred –** No connection to existing facility at Yonge St.	**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 Blvd 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.
	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) *Existing* *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 Blvd intersections with road safety concerns	**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. Road Segments identified on list include: 1)		**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
		Existing 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*	Yonge to Jarvis; 2) Jarvis to Sherbourne; and 3) Don Rd to Carlaw. Intersections identified on list include: 1) Jarvis; 2) Sherbourne; 3) Don Rd; and 4) Carlaw. Maintain and Improve do not improve the majority of the existing road safety concerns. Existing constraints including free flow ramps and columns obscuring sight lines on Lake Shore Blvd. Maintain alternative does not include budget for improvements to Lake Shore Blvd. 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 Blvd 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 Blvd 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 Blvd 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.			
		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**

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
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 Blvd 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 neighborhood objectives.
	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 Blvd. Gardiner structure remains.		**Moderately Preferred** – Minimal opportunities for skyline views from Lake Shore Blvd. Gardiner structure remains.	**Preferred** - Fully opens up all the skyline views from Lake Shore Blvd.
	Public realm area (acres)	Usable public realm area in new Lake Shore Blvd public right-of-way dedicated for pedestrian uses,	**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.	**Preferred –** Reconstruction of the corridor allows for most public realm area to be created. Approximately 15 acres.

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
		patios, passive recreation, multi-use trails and landscaping.			Approximately 13 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 Blvd 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 Blvd 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 Blvd.			**Preferred** – Proposed north side buildings provide a buffer to LSB (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 Blvd 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 Blvd 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 Blvd 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**
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%.

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
	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.*	**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 Blvd 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 Blvd 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 Precinct as the relocation of Lake Shore Blvd will allow for planting and natural features along Lake Shore Blvd and the Keating Channel.	**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 ground level of Lake Shore Blvd. This increases the potential for planting and natural features. Minimal improvement through the Keating Precinct as the relocation of Lake Shore Blvd will allow for planting and natural features along Lake Shore Blvd and the Keating Channel.	**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 Blvd. This increases the potential for planting and natural features.	**Preferred** – With no elevated structure through the corridor, opportunities for planting and natural features are greatly increased due to increased sunlight.
	Aquatic Environment	• Potential to create new aquatic habitat	**Equally Preferred** – Relocation of Lake Shore Blvd through Keating 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 Precinct the new Lake Shore Blvd 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 Blvd. 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 St.	**Minimally Preferred** – Reducing the deck of the Gardiner will allow for more light to penetrate the ground level of Lake Shore Blvd. west of Cherry St.	**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 Blvd.	**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 Blvd out from under the elevated structure through Keating Precinct provides for increased opportunity for a tree canopy along the road corridor but not included as part of this alternative.	**Moderately Preferred** – Some improved opportunity for new trees west of Cherry St. and east of Cherry along new Lake Shore Blvd 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 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).	**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% coverage in corridor).
		Natural Environment Summary Ranking	**Less Preferred**		**Moderately Preferred**	**Preferred**

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
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 Blvd 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.			
		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

Study Lens/ Criteria Group	Criteria	Measures	MAINTAIN	IMPROVE	REPLACE	REMOVE
						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.
	On Street Parking	Ability to provide on-street parking *(All options allow for off-peak period parking on Lake Shore Blvd in the Keating Precinct)*	**Less Preferred** – No opportunities for off-peak parking along Lake Shore Blvd with the exception of the re-alignment Lake Shore Blvd 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 Blvd 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 Blvd east to Logan, Don Roadway improvements, Engineering costs)	$410 million (2013$) • Includes basic intersection improvements along Lake Shore Blvd, additional urban design and landscaping improvements and Lake Shore Blvd 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 Blvd 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 Blvd construction and major urban design and landscaping throughout • Includes construction of new bridge structures across Don River to connect to Lake Shore Blvd 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.
		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 Lens/ Criteria Group	Criteria	Measures	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
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 BLVD 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**

4.2.1 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. 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.

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 higher usage of the Gardiner/Lake Shore Blvd East corridor. The AM peak hour was chosen to be assessed as it provides the most consistent commuter travel patterns. Afternoon (PM) travel often varies for commuters depending on the day. Results of the transportation modelling work are documented further in **Appendix C**.

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. Also assumed to be in place are the City planned transit projects including: GO service expansion, Downtown Relief Line, Waterfront LRT, Broadview extension/streetcar. It is noted that Travel Times were also modelled as a sensitivity test 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 2-3 minutes for the alternatives (over the Travel Times modelled for each alternative in 2031 with the planned transit projects in place). This illustrates that transit, while necessary to accommodate future travel demand, does not have a large impact on Auto Travel Times for the selected OD pairs.

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**). The Maintain, Improve and Replace alternatives incorporated a 15% demand reduction. The Remove alternative incorporated a 25% demand reduction recognizing the additional road capacity reduction associated with this alternative.

The modelling results indicate that for the select OD pairs, the Improve and Replace alternatives have similar or up to 5 min greater Average AM peak hour Travel Times than the Maintain alternative. The

Remove alternative is 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 provides information on the volume of automobiles affected. The Improve and Replace alternatives have no increased Travel Times greater than 7 min (over the Maintain). For the Remove alternative, 5% of vehicles would experience a greater than 7 min increase in Travel Time within the Transportation Study Area.

The final criterion considered in this criteria group is Road Network Flexibility/ Choice which is 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. 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 Maintain alternative as the base case is *preferred*. 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 will 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 are 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 are ranked as *preferred* as reconstruction of the corridor allows for Sidewalks to be built to City standards along the entire length of Lake Shore Blvd. Improve is ranked *moderately preferred* as Sidewalk improvements are not possible at all north-south crossings. Finally, the Maintain is *less preferred* as existing sidewalks are substandard along north-south streets.

The second measure considered Crossing Points. The Replace and Remove are 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 is ranked *less preferred* as improvements and standardization is possible at a number of intersections. However, existing constraints do not allow standardization of crosswalks on both the east and west side of the street for all intersections. Maintain is ranked *less preferred* as existing constraints do not allow standardization of crosswalks on both the east and west sides of the street. Improvements have not been budgeted under the rehabilitation program.

Finally, the third measure under the North-South Sidewalks criterion measured Crossing Distances. The Replace alternative is 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 are 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 are *preferred* as reconstruction of the corridor allows for sidewalks to be built to City standards along the entire length of Lake Shore Blvd for use by both the local community and travelers on the north and south sides of Lake Shore Blvd. In total, 4,400 total linear metres of sidewalk are possible. The Improve alternative is *moderately preferred* as sidewalks on the north side of Lake Shore Blvd 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 is *less preferred* as existing sidewalks are sub-standard and/ or not existing in parts of the corridor. Improvements are not budgeted under the existing Gardiner rehabilitation program. Re-alignment of Lake Shore Blvd in Keating allows 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 involve shorter Crossing Distances of Lake Shore Blvd. The Improve alternative is ranked *moderately preferred* as it provides for improved North-South and East-West Sidewalks, but also involves a greater Lake Shore Blvd Crossing

Distance. The Maintain alternative is ranked as *less preferred* as it provides limited Sidewalks and involves the longest Lake Shore Blvd Crossing Distances (measured at Jarvis Street).

Cycling

This criteria group has one criterion, East-West Movement, and includes 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 is *moderately preferred* as it allows for a facility of 3,690 m in Length and which would extend as far west as Jarvis Street The Replace and Remove alternatives are *preferred* as they allow 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 (see **Table 2** for a listing of these other facilities). The Maintain alternative includes no new facility so is the *least preferred*. The Improve alternative includes connections with all facilities except Yonge Street and is ranked as *moderately preferred*. Finally, the Replace and Remove alternatives are ranked as *preferred* as the new cycling facility can connect with all existing and planned cycling facilities.

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

Movement of Goods

This criteria group includes two criteria: Vehicle Operations and Access Opportunity. Vehicle Operations considers 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 are 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 has the most Turning Prohibitions (6 in total) and is ranked *less preferred*. Improve has fewer Turning Prohibitions (3) and is ranked *moderately preferred*. Replace and Remove have no or a limited number of Turning Prohibitions and are *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 is considered to be a more

important measure of potential impact on goods movement, then Maintain/Improve are ranked as *preferred*, Replace as *moderately preferred* and Remove as *less preferred*.

Safety

The Safety criteria group includes 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. See **Table 2** for the measures considered under each of these criteria which define the safety issues being examined. 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, is *preferred*. The Maintain/Improve alternatives both have a 6-lane crossing section and are 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 include free flow turns, ramps, etc. The Remove alternative is ranked as *preferred* as it eliminates all free flow right turns. While greater volume of traffic will be on an at-grade street, design speed will be lower and the new road can be designed to accommodate expected volume to meet safety standards. The other alternatives were all ranked *less preferred* as they include more uncontrolled access points.

For the Safety Risk for Cyclists and Motorists criterion, as presented in **Table 2,** there are several existing safety concerns within the corridor. Replace and Remove are ranked as *preferred* as they eliminate existing road safety concerns at Jarvis Street, Sherbourne Street, and the Don Roadway. Maintain and Improve do not improve the majority of the existing road safety concerns, although the Improve does eliminate the southbound right turn channel on Sherbourne Street. These two alternatives are therefore ranked as less *preferred*.

Finally, for the criterion Safety Risk for Motorists on FGE, Maintain is considered to be *less preferred* as it will still result in sub-standard shoulders along the Expressway. The Improve and Replace alternatives provide improved shoulders along the expressway and are thus *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 are less substantial than for Replace and Remove. Maintain was ranked overall as *less preferred* as it generally results in a higher Safety Risk to all users of the corridor.

Constructability

Appendix E presents the preliminary construction staging plans for the alternative solutions. The Constructability criteria group includes 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 is 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 has the longest multi-stage construction period. The Duration of construction for Remove will have a greater impact on lane closures than Maintain and Improve but will 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 will 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 will allow access to the corridor throughout the construction period but there will be some impacts off-site to support traffic flow. Replace was ranked as *less preferred* as it has the greatest impacts on Traffic Management with periods when traffic flow cannot be accommodated through the corridor and will 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 will have some potential private property access impacts and has the potential to require some private property during construction. The Replace alternative was ranked as *less preferred* as it has the potential to require some private property during construction as well as require 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.

4.2.2 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 include "Removing Barriers/Making Connections", "Promoting a Clean Green Environment", and "Transforming Lake Shore Blvd into an Urban Waterfront Avenue". Maintain and Improve were ranked *less preferred* for this criteria as they do little to achieve the CWSP principles. Replace was ranked *moderately preferred* as it proposes 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 Blvd. Remove was ranked *preferred* as it fully achieves 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 is because although they allow the precinct plans to be achieved, they do not support the development of the highest value of land uses adjacent to Lake Shore Blvd. This is primarily due to the continued presence of an elevated structure through the corridor. Remove is ranked as *preferred* for this measure as it is consistent with physical plans for the precincts and in addition it most successfully meets the plan definitions of high quality and high value design for the land uses along Lake Shore Blvd.

Overall for the Planning criteria group Remove is *preferred* as it reflects longstanding Waterfront design aspirations and creates 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 is *moderately preferred* as it encourages some improvement to study area in accordance with the planning documents, while Maintain and Improve are *less preferred* as they do not contribute to advancing the plans for the study area.

Public Realm

In a City that is built on strong neighbourhoods, criteria regarding vibrant street life, public spaces, safety, and visual continuity were created to understand the varied ways in which changes to the Gardiner and Lake Shore Blvd would affect the urban design character. 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 considers the quality, consistency and character of the streetscape along Lake Shore Blvd. Maintain and Improve are ranked *less preferred* for Streetscape as there are 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 Blvd. There will be improvements to Streetscape through the Keating Precinct with the relocation of Lake Shore Blvd away from the Keating Channel and the balancing of the realigned section of the roadway with pedestrian realm as per the Keating Precinct Plan. However, the Streetscape conditions between Jarvis Street and Cherry Street will see little transformation from either alternative. For Maintain there will 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 Blvd. The Improve alternative presents minimal advances over the Maintain condition. Although there will be some improvements to crossings, road geometries and landscaping of Lake Shore Blvd.

Replace has been ranked as *moderately preferred* and Remove as *preferred* for the Streetscape criterion. This is a reflection of the improved Streetscape condition that Replace presents over Maintain and Improve and the full achievement of an urban boulevard design for Remove. Replace presents a narrower roadway at grade for Lake Shore Blvd which offers opportunities for softscape landscaping that offsets the hardscape of the paved roadway. Remove presents human-scale fixtures, standard city finishes, full sun exposure, no noise amplification (as the structure is 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 Blvd. This opens up development and public realm opportunities along Keating Channel. However, from a Streetscape perspective, the realigned Lake Shore will have the new elevated expressway above it which will reduce opportunities for streetscaping Lake Shore Blvd through Keating. For Remove, there is no longer an elevated structure, which results in opportunities for development along Keating Channel as well as a greatly enhanced streetscape for the new urban boulevard. Together these elements result in Remove as *preferred* for streetscaping.

For the View corridors criterion, Maintain and Improve are ranked *less preferred* as they provide no opportunities to enhance Lake Shore Blvd-level views of the city skyline or waterfront as the dominant visual mass of the Gardiner Expressway structure remains in the corridor. Replace provides some improved view corridors as the expressway structure is higher and there are fewer supporting columns blocking views. However, the elevated structure still exists in Replace and therefore it is ranked as *moderately preferred*. Remove provides 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 is ranked as *preferred* to address view corridors.

The Public Realm Space criterion considers 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 are *less preferred* with little enhancement for Public Realm Space as there is still 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 is a result of the ability to build an expressway that requires significantly less footprint for columns and ramps while also providing a reduced number of lanes on Lake Shore Blvd. It is Remove that provides the greatest useable public realm area. Remove is *preferred* as it frees up the most usable publicly owned land for an improved Public Realm and potential north-side development parcels. These are opened up as a result of removing all of the infrastructure supporting the elevated expressway.

The Usable Park Area criterion considers 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 are *moderately preferred* for this criterion. Both alternatives allow for some new Park Area to be dedicated along the rail corridor. Maintain and Improve are *preferred* as, although they do not open up as much new land for development, the re-alignment of Lake Shore Blvd allows 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 is the Rail Corridor and Berm criterion. This criterion examines 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 Blvd. The Remove is ranked as *preferred* for this criterion and all other alternatives ranking as *less preferred*. This is due to the limited ability for Maintain, Improve, or Replace to mitigate the Rail Corridor. The 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 provides the only opportunity to alter the exposure of the Rail Corridor to pedestrians. This is due to the Remove plan proposal to include development on the north side of Lake Shore Blvd. 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 Blvd.

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

Built Form

The consideration of Built Form relates 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. Good indicators of such urban value are found along streets where the buildings that front onto a street provide quality uses. As such, the Built Form criteria group measured Street Frontage opportunities on Lake Shore Blvd. 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 Blvd 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 offer no increase in active building fronts at grade. The presence of the existing elevated structure in both of these alternatives also impacts the quality of space for the lower three floors of the podiums for the developments fronting on Lake Shore Blvd. Replace is *moderately preferred* as it advances the corridor in terms of the quantity of building fronts that would be expected to have active at-grade uses. This is due to the improved pedestrian and public space available at grade to support an active pedestrian

street in Replace. However, Replace still contains an elevated expressway structure that is approximately 15 m high. This impacts the first four storeys of buildings along Lake Shore Blvd and would be less preferred. Remove is *preferred* and presents 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 Blvd. As the new boulevard would consist of a two-sided street it would provide activity on both sides of Lake Shore Blvd. Remove also eliminates 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 are ranked *less preferred,* Replace as *moderately preferred,* and Remove as *most preferred* for the Built Form criteria group.

4.2.3 Environment

Social and Health

Two criteria are 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. **Appendix F** provides a technical summary of the Air Quality analysis work that was completed. **Table 2** provides the air emission levels that have been predicted for each of the alternatives. 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 km's travelled and average vehicle speed were considered in the analysis.

Extent of Change in Regional Air Quality considered several parameters, including NOx, VOC, & PM2.5. The "region" considered in this analysis is 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). These alternatives were ranked equal and considered to be *less preferred.* The Remove alternative is *preferred* and is predicted to have a regional air emission burden contribution of 0.24%.

For the next measure, Extent of Change in Local Air Quality, the same parameters were modelled (NOx, VOC, & PM2.5). Over 2,000 points of reception were identified and air emission levels modelled for these locations considering both existing and future planned land uses. See **Appendix F** for the modelled air emission levels. The greatest difference among the alternatives is for NOx and PM2.5. The results of this analysis indicate that the Remove and Replace alternatives are predicted to have the lowest air emissions for the local area receptors and are *preferred*. The Improve alternative is ranked *moderately preferred* and the Maintain alternative is 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. Modelled GHG emission burden levels are presented in **Table 2** in this report and **Appendix F** presents the modelled levels. 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%.

Considering the preference ranking for the three air quality measures, the Remove alternative was consistently ranked as *preferred* with the lowest emission levels, followed by the Improve and Replace alternatives being ranked as *moderately preferred* and Maintain, with the highest modelled emission levels, is ranked *less preferred*. It is noted that Air Quality analysis results are influenced by the different traffic volumes associated with the alternatives. Recall that the Remove alternative has been assigned about 10% less demand (volume) in the transportation model than the other three alternatives due to the reduced road capacity associated with this alternative. As such, the reduced traffic volume associated with the Remove alternative results in less air emissions.

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. As presented in **Appendix G**, the receptors that had the greatest modelled variation in Noise Levels for the alternatives were those located in proximity to the Gardiner/Lake Shore Blvd East corridor. Based on the modelled results, Remove is predicted to have the lowest Noise Levels for identified receptors with local area Noise Levels ranging from 61 to 72 dBA and is ranked as *preferred*. The Improve and Replace alternatives have 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 is predicted to result in Noise Levels that range from 69 to 78 dBA and is thus ranked *less preferred*.

Considering the Noise and Air Quality modelled results and preference rankings, the Remove alternative is ranked as *preferred* with the lowest predicted levels. The Improve and Replace alternatives are ranked *moderately preferred* with slightly higher air emission and Noise Levels and Maintain is 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). Regarding the first criterion, Terrestrial Environment is influenced by the condition of the natural green space and opportunities to support natural vegetation on the land. Maintain is *less preferred* as there is no opportunity to improve the Terrestrial Environment through the Jarvis Street to Cherry Street section of the corridor. In the Keating Precinct the relocation of Lake Shore Blvd will allow for planting and natural features along the

boulevard. Improve presents the same Terrestrial Environment opportunities through Keating Channel and provides some modest improvements for planting and natural features between Jarvis Street and Cherry Street. With the reduction in the deck of the elevated Gardiner there is more access to light at ground level which will support the Terrestrial Environment. As such, the Improve alternative is *minimally preferred* over Maintain. Replace is ranked as *moderately preferred* for Terrestrial Environment as there is 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 is not the preferred alternative. Remove is ranked as *preferred* as it has no elevated structure which results in greater opportunities for planting and natural features due to increased sunlight.

For the Aquatic Environment criterion the alternatives are all ranked equally. The relocation of Lake Shore Blvd through the Keating Precinct will allow for improved runoff control into the Keating Channel. This provides for some improvement of aquatic habitat in the Keating Channel, which is the case with all alternatives. All of the alternatives will also utilize the new Don River crossing proposed in Don Mouth Naturalization Project, which supports an improved Aquatic Environment. As all of the alternatives provide these improvements they are all ranked equally.

The Water Quality and Water Quantity criteria relate to how water can be treated and managed on-site. In regards to Water Quality, Replace is ranked *preferred* as it provides the greatest amount of new available unpaved ground surface with the reduction of Lake Shore Blvd. This presents the greatest opportunity for source controls/ground infiltration along the corridor. Remove is ranked *moderately preferred* as 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. Maintain and Improve are *less preferred* as there is limited potential to improve the Water Quality with these alternatives.

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 are *preferred* with paved surface areas of 91,095 sq. m and 84,575 sq. m respectively. The Improve alternative is *moderately preferred* with 114,010 sq. m of paved area and the Maintain is less *preferred* with 125,074 sq. m of paved area.

For the Microclimate criterion, east of Cherry Street both Maintain and Improve provide the same condition. Maintain is *less preferred* as it has the least amount of natural light access to street-level west of Cherry Street. For Improve, reducing the deck of the elevated expressway will allow for more light to penetrate the ground level of Lake Shore Blvd west of Cherry Street and therefore Improve is *minimally preferred*. Replace provides an improved Microclimate condition over Improve as the new elevated structure will be higher and have fewer bents/columns, allowing more light to penetrate the ground level and is ranked as *moderately preferred*. Remove is *preferred* as it presents the best Microclimate condition, opening up the entire area to sunlight with the removal of the elevated structure. In addition, the Remove alternative includes the greatest number of trees, which provide shade and reduce heat impacts in the summer in areas with vast amounts of pavement.

Finally, under the Natural Environment criteria group is 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 provide the same condition east of Cherry Street with regards to Tree Canopy. West of Cherry Street, Maintain is *less preferred* as it provides minimal potential for tree planting. Improve is *moderately preferred* as there is some potential for tree planting west of Cherry Street along Lake Shore Blvd. Replace is also *moderately preferred* for the Tree Canopy criterion. This is because the new elevated structure will allow more light to penetrate the ground level. This increases the potential for a Tree Canopy along the corridor. Remove is *preferred* for this criterion as it presents 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 results in the greatest potential for Tree Canopy.

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

Cultural Resources

The Cultural Heritage criteria group considered four criteria including: Built Heritage, Cultural Landscape, Archaeology, and First Nation People and Activities. Regarding the first two criteria groups, none of the alternatives are 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 are expected to result in impacts to First Nation 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 is *preferred* with the potential for impact on three archaeological features (see Table 2). The Improve alternative was also considered as *preferred* as it would result in the potential for impact on only two additional features. The Replace and Remove alternatives have the potential for impact on nine additional features. As the level of excavation associated with the Remove alternative is less, the Remove was ranked *moderately preferred* and Replace was ranked as *less preferred* for Archaeology.

Based on the criteria assessed, Maintain and Improve are *preferred* for Cultural Resources, Remove is *moderately preferred*, and Replace is *less preferred.*

4.2.4 Economics

The following presents the assessment and evaluation results for the Economics lens. **Appendix H** provides further detail regarding how the economic analysis was completed.

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 CBD's. The research considered cities listed on the North American Competitiveness Ranking[1] and compared the rankings of the cities to the highway access that exists in these cities. **Table 3** shows that there is a wide variety of approaches to CBD highway access and they do not appear to relate to the economic competitiveness of cities.

Table 3 – Central Business District Highway Access and North American Competitiveness Ranking

City	Economist/Citi North American Competitiveness Ranking	CBD Highway Access
New York	1	Remove
Chicago	9	Never Built
Toronto	10	Under Study
Washington	14	Maintain
Los Angeles	17	Maintain
San Francisco	18	Remove
Boston	19	Replace (Tunnel)
Houston	27	Maintain
Vancouver	28	Never Built
Dallas	32	Maintain
Atlanta	33	Maintain
Seattle	35	Improve/Replace (Tunnel)
Montréal	36	Under Study
Miami	40	Maintain
Philadelphia	48	Improve

The case study research also considered population and employment growth as well as office vacancy rates in cities/CBD's with and without freeway access. Based on the case study research, which is discussed further in Section 2.3.2, 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

[1] The Economist Intelligence Unit Limited, *"Hot Spots 2025: Benchmarking the Future Competitiveness of Cities"*, 2013, commissioned by Citi.

From a 2008 study by HDR Corporation (HDR) on behalf of Metrolinx[2], 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", is 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). HDR forecasts this figure to rise from $6 billion in 2006 to $15 billion per year by 2031 in the absence of any major transportation system improvements.

The HDR study defines 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. In other words, it is not the total cost of travel, but the relative travel cost difference between these scenarios. 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, as noted above, 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 include the delay to transit users, so when factoring out these transit delays the cost of congestion to auto commuters in the GTHA and Toronto are $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:

> *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.
>
> *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.
>
> *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.
>
> *Excess Accident Externality Costs* – Congested traffic conditions result in a higher accident rate, which translates into additional costs to auto users.

[2] Costs of Road Congestion in the Greater Toronto and Hamilton Area: Impact and Cost Benefit Analysis of the Metrolinx Draft Regional Transportation Plan. Final Report, December 1, 2008. HDR Corporation

At an overview level, the City of Toronto AM peak period vehicle kilometres of travel (vkt) on all roads was estimated to be 9.3 million in 2006. This represents approximately 30% of the vkt in the GTHA during the AM peak period. During this same period, the Gardiner East vkt is currently approximately 50,000 during the AM peak period, which represents approximately 0.5% of the AM peak period vehicular travel in the City.

In 2031, according to the HDR report, the vkt in Toronto is expected to decrease to 8.4 million with the implementation of the transit improvements included in the Metrolinx draft Regional Transportation Plan. This vkt total represents approximately 23% of the total GTHA vkt as significant growth and auto travel occur in the surrounding regions.

With these assumptions, the estimated "cost of congestion" to auto commuters is summarized below in **Table 4**. 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.

Table 4 – Estimated Cost of Congestion to Auto Commuters

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

The figures in Table 4 indicate that the cost of congestion to auto commuters in the Gardiner East study area is approximately $6.5 million annually. With the growth in auto demand to 2031, the expected cost of congestion is estimated to increase to $14.6 million annually in the study area with the Maintain alternative. With the Remove alternative, the cost of congestion for those commuters who continue to use auto will decrease slightly to $14.4 million annually for the Gardiner East study area. It is important to note, however, that this is not an indication of reduced traffic congestion in the area with the Remove alternative. Congestion will increase with the removal of the east section of the Gardiner. Instead, it is a reflection of the reduced vkt in the study area as a result of the required diversion of trips from auto to other modes, travel times or alternative routes. 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 project congestion cost of $2.8 billion for the City of Toronto).

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 is 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 do 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 are *less preferred* for this measure as they would encourage no change in existing visitor/tourism attractiveness. The Replace alternative is *moderately preferred* as it provides 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 is Remove that has the highest potential to attract additional tourists/visitors to the waterfront and allows for on-street parking (off-peak periods) which can contribute to at-grade retail uses and visitor increases in the corridor. As such, Remove is ranked *preferred* for the Visitor/Tourism Attractiveness measure.

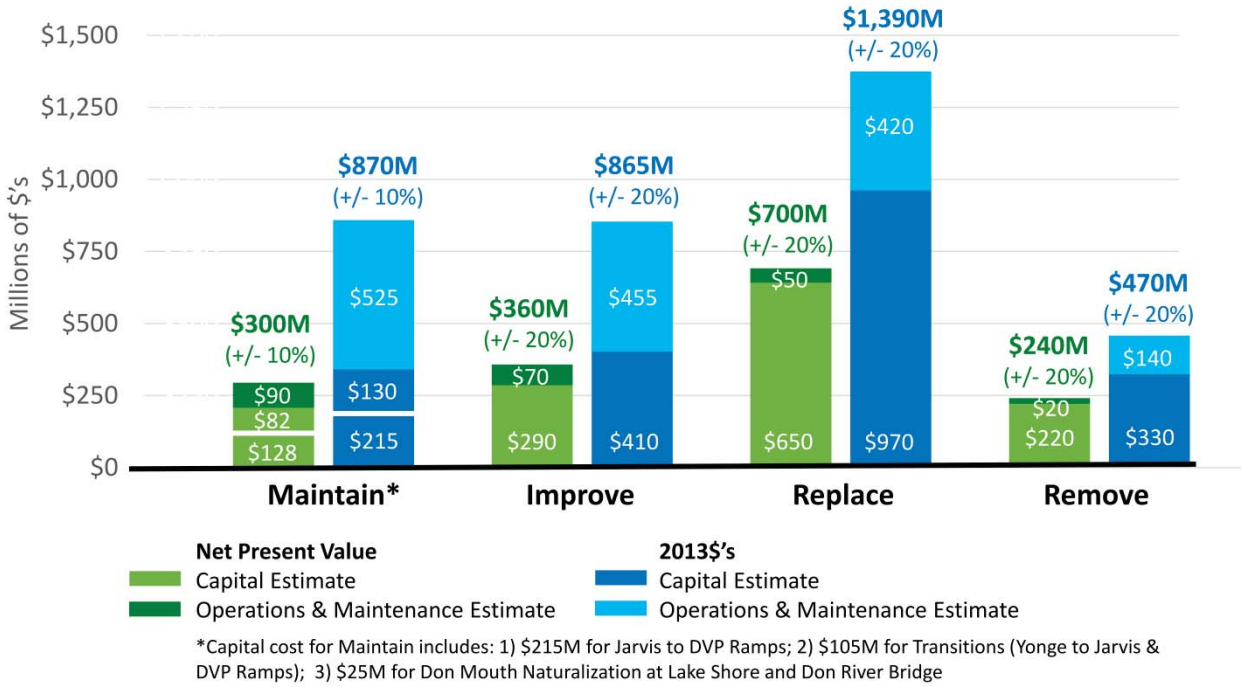
For On-Street Parking, the criteria measure looks at the ability to provide On-Street Parking which would encourage at-grade retail uses and improved street life. This measure considers the area west of Cherry Street for parking as all of the alternatives would allow for off-peak period parking on Lake Shore Blvd in the Keating Precinct. Maintain and Improve are *less preferred* as they do not allow for On-Street Parking west of Cherry Street. Replace and Remove are ranked *preferred* as Lake Shore Blvd 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 is Direct Cost and Benefits. Three criteria were considered, Capital Cost and Funding, Lifecycle Cost and Land Value Creation. In regards to the criterion Capital Cost and Funding, **Table 2** in this report presents the estimated capital costs for the alternatives. **Appendix I** describes how these capital costs were generated. The Remove alternative is *preferred* for this criterion as it has the lowest estimated capital cost at $330 M. This is followed by Maintain ($345 M), Improve ($410 M) and Replace which is the most expensive at $970 M (all costs in 2013$). 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 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 alternative was ranked *preferred* with the lowest lifecycle cost ($240 M). The next lowest NPV cost alternative is Maintain at $300 M, followed by Improve at $360 M and the most expensive is Replace with a NPV cost of $700 M. **Figure 6** provides a breakdown of the 100-year lifecycle costs in 2013$ and NPV.

Figure 6 – 100-year Lifecycle Costs (2013$ and NPV)



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 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 is identified as *preferred* with a NPV net cost of $155 M. The Maintain and Improve alternatives are ranked *moderately preferred* with a NPV net cost of $300M and $358 M. The Replace alternative is ranked *less preferred* as it has the highest NPV net cost at $632 M.

4.3 Comparison of Alternatives

Considering the preference rankings of the alternatives by criteria group as described in the previous section, the following presents the comparative evaluation of the alternatives. This comparison is

undertaken in two ways; first is an overview level comparison of the alternative preferences by criteria group. And second, a paired-comparison approach is presented.

4.3.1 Criteria Group Preference Overview

Considering the ranking of alternatives by criteria group as presented in the previous section and in **Table 2**, this section presents an overview of the preference rankings. **Table 5** 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.

Table 5 – Criteria Group Ranking Summary

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				
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

4.3.2 Paired-Comparison Evaluation

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 6.**

The first comparison made was **Maintain vs. Improve**. The results of this comparison are presented in **Table 6**. 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 Blvd, and an addition of an east-west multi-use pathway along the north edge of Lake Shore Blvd. 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 6**. 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 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 is recommended as the technically preferred alternative.**

Table 6 – Paired-Comparison Evaluation Matrix

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 Blvd generally the same.	Preferred – Safety levels along LSB 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 Blvd 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.			
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 life-cycle 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).		

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 Blvd 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 Blvd 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 Blvd 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 Blvd.		
Environment	Social & Health	Equal – Modeling results indicate that the alternatives would result in similar air emissions and noise levels.		Minimal difference between these two alternatives and therefore they are ranked equally.	**EQUAL**
	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.		
	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 LSB 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).		

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.		
	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 Blvd 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 Blvd.		
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).		

5. CONCLUSION

The results of the alternative evaluation identify the Remove alternative as the technically preferred alternative. It is important to highlight that 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.

In recent years the City and Waterfront Toronto have made great strides in creating a network of exciting and successful public realm additions along the waterfront and in defining the urban design

character of new neighbourhoods for the next generation of waterfront precincts. Support for the Remove alternative builds on this past work and enables future success. The demolition of the elevated Gardiner structure with the Remove alternative creates an opportunity for dramatic improvement in the Urban Design fabric of the City – an opportunity at a scale and with immediate benefit seldom possible in an established city.

Identifying Remove as the preferred alternative is further supported through the recognition that road volumes to the City core have largely been constant over the last 20 years and that the City has supported the increase in commuter volumes to the CBD through transit and active transportation modes. This mode split trend will need to continue in the future to meet anticipated growth in demand from Downtown commuters. Further, as shown in the examined case studies of other jurisdictions (see Section 2.3.2), both with and without elevated expressways near Downtown areas, it becomes clear that an elevated expressway in proximity to a city's central business district is not essential. Cities such as Chicago have never extended an expressway into downtown, and other cities such as San Francisco or New York have chosen to take them down without having significant impacts on traffic and other commuters.

The results of the technical evaluation were presented to the public at the February 6, 2014 Public Information Centre. Comments from the public regarding the alternative solution evaluation are being solicited until February 20, 2014. The identification of Remove as the technically preferred alternative has generated different reactions from the public to date – some have indicated support whereas others have indicated that additional traffic delay is not acceptable no matter the benefits.

To ignore the many and varied benefits of Remove and choose another alternative, decision-makers would need to support the opinion that the benefit that the Gardiner East provides to the small proportion of the Downtown bound commuters that utilize it (about 4% in the eastbound direction and 3% in the westbound direction during the AM peak hour) is more important than the enabling of five growing neighbourhoods along the waterfront to develop as some of the very best places to live and work in Toronto, which can be achieved with a cost savings to the City.

It is understood that the City will be considering the results of this technical evaluation along with the public comments in preparing its recommendation to Council that is to be documented in the City Staff Report which is to be available for public review in association with the March 4, 2014 meeting of the Public Works and Infrastructure Committee.

APPENDIXES

Appendix A – 2009 Terms of Reference

Appendix B – 2009 Case Studies Report

Appendix C – PARAMICS Model Results Summary

Appendix D – Transportation Demand Management Paper

Appendix E – Construction Staging Summary

Appendix F – Air Quality Assessment Summary

Appendix G – Noise Assessment Summary

Appendix H – Economic Assessment Summary

Appendix I – Capital Cost and Net Present Value Estimate Summary

Appendix A
2009 Terms of Reference

Gardiner Expressway
and Lake Shore Boulevard Reconfiguration

EA Terms of Reference

WATERFRONToronto TORONTO

DILLON CONSULTING LIMITED . PERKINS+WILL . MORRISON HERSHFIELD

SEPTEMBER 2009

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Table of Contents

1.0 Introduction and Background....pg 1
- 1.1 Introduction....pg 1
- 1.2 Historical Background....pg 1
- 1.3 Project Co-Proponents....pg 2

2.0 Description of the Environmental Assessment Process....pg 4
- 2.1 Ontario Environmental Assessment Act....pg 4
- 2.2 Canadian Environmental Assessment Act....pg 5
- 2.3 EA Study Process Overview....pg 5

3.0 Purpose of the Study and Undertaking....pg 7
- 3.1 Purpose of the Study....pg 7
- 3.2 Purpose of the Undertaking....pg 7
- 3.3 Problems....pg 7
- 3.4 Opportunities....pg 8

4.0 Description and Rationale for the Undertaking....pg 10
- 4.1 Description of the Undertaking....pg 10
- 4.2 Rationale for the Undertaking (Project Goals)....pg 10

5.0 Existing Environment and Potential Effects....pg 17
- 5.1 Study Areas....pg 17
- 5.2 Overview of Existing Conditions....pg 18
- 5.3 Potential Environmental Effects of the Undertaking....pg 24

6.0 Alternatives to be Considered....pg 26
- 6.1 Alternative Solutions (Alternatives to the Undertaking)....pg 26
- 6.2 Alternative Designs (Alternative Methods of Carrying out the Undertaking)....pg 29

7.0 Assessment and Evaluation Process....pg 30
- 7.1 Introduction....pg 30
- 7.2 Four Evaluation "Lenses"....pg 30
- 7.3 Evaluation Process Steps....pg 31

8.0 Development of a Monitoring Strategy and Schedule....pg 35

9.0 Development of the Consultation Plan....pg 35
- 9.1 Consultation in Preparation of the EA Terms of Reference....pg 35
- 9.2 Process for Consultation During the EA....pg 36
- 9.3 Record of Consultation and Supporting Documents....pg 40

10.0 Modifications During the EA Process....pg 41

11.0 Other Approvals Required....pg 41

Table of Contents
(Continued)

List of Figures

Figure 2.1 EA Study Process.....pg 6
Figure 5.1 Study Areas.....pg 18
Figure 5.2 Context Map.....pg 19
Figure 5.3 Central Area Person Trips by Mode.....pg 18

List of Tables

Table 7.1 Proposed Evaluation Criteria Groups.....pg 33
Table 9.1 Key Consultation Activities for EA ToR.....pg 36
Table 9.2 EA Consultation and Communication Activity Study.....pg 39

Appendices

Appendix A - Proposed EA Work Plan
Appendix B - Government Review Team Comments and Responses Table

1.0 Introduction and Background

1.1 Introduction

Waterfront Toronto and the City of Toronto (City), the project co-proponents, are jointly undertaking a major study to determine the future of the eastern portion of the elevated Gardiner Expressway and Lake Shore Boulevard from approximately Lower Jarvis Street to just east of the Don Valley Parkway (DVP) at Logan Avenue.

Waterfront Toronto and the City are committed to a fully-integrated study process that consists of:

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

This unique, fully integrated study process is intended to ensure that strong city-building objectives remain at the centre of the technical analysis and that a successful urban environment characterized by design excellence results from this effort.

The project co-proponents have elected to conduct the study as an Individual EA. Through this EA, the 'undertaking' (or project) will be determined. The first step of the EA process is to prepare a Terms of Reference (ToR). This document fulfills that requirement. The ToR sets out the study process to be followed in conducting the Individual EA, including a description of how the public, stakeholders (interest groups), Aboriginal communities, and agencies will be consulted.

1.2 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 York Street by 1962, the Don Valley Parkway by 1964, and finally Leslie Street by 1966.

The route of the Gardiner Expressway required the taking 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 removal of a segment of the Gardiner Expressway east of the Don River, between Bouchette Street and Leslie Street, was completed in 2003.

1.3 Project Co-Proponents

Waterfront Toronto and the City are jointly conducting this EA and will act as co-proponents. The decision to undertake this study was made by the Waterfront Toronto Board of Directors and Toronto City Council in 2008.

1.3.1 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,

View of Gardiner Expressway and Downtown Toronto from the south-east.

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.

1.3.2 City of Toronto's Waterfront Objectives

The City, which owns and operates the Gardiner Expressway and Lake Shore Boulevard, established the Waterfront Secretariat in 2001. This department leads and oversees the City's participation in the revitalization of Toronto's waterfront and serves as the "one window" for Waterfront Toronto to the City. The Secretariat advises City Council on the activities of Waterfront Toronto, ensures collaboration across divisions, agencies, boards, and commissions in the planning and delivery of waterfront initiatives, and provides strategic direction on the management of municipal assets in the Central Waterfront. It also ensures that the City's policies, priorities and regulations are respected and reflected in all decision-making processes associated with waterfront revitalization, including tri-governmental negotiations.

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 and remaking streets as "places".

2.0 Description of the Environmental Assessment Process

2.1 Ontario Environmental Assessment Act

This project is subject to the Ontario *Environmental Assessment Act* (EA Act). 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. As an Individual EA, the first stage is to prepare the ToR which is submitted to the MOE for review and approval. Following the approval of the ToR by the Minister of the Environment, the EA study can commence.

The project co-proponents intend to conduct the EA study in accordance with all of the general requirements of subsections 6(2)(a) and 6.1(2) of the Ontario EA Act. As such the EA will consider 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;*
- *A description of:*
    - o *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;*
    - o *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;*
    - o *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.*

Other EA approvals (e.g. Municipal Class EA) identified through the course of this EA may be required for changes to infrastructure that will be required to accommodate this project. The scope of this EA study may be expanded to incorporate these changes. Other provincial approvals may be required to implement the project (the 'undertaking') and will be determined in the EA study.

Further, it will be important while conducting this EA to consider the recommendations of other EA planning processes that have been commenced and/or undertaken in and adjacent to the study area (including for example the *Queens Quay EA*, the *Don Mouth Naturalization and Port Lands Flood Protection Project EA, Lower Don Lands Class EA,* and the *York-Bay-Yonge Ramps EA*).

2.2 Canadian Environmental Assessment Act

The co-proponent's undertaking is subject to the requirements of the Ontario *Environmental Assessment Act.* The requirements of the *Canadian Environmental Assessment Act* (CEAA) may also apply. The co-proponent intends to work in a coordinated way with provincial and federal governments, both governments having formally agreed to coordinate their respective EA processes pursuant to the *Canada-Ontario Agreement on Environmental Assessment Cooperation* (November 2004).

2.3 EA Study Process Overview

Figure 2.1 presents a flowchart of the intended EA process to be followed to select and develop a preferred design (the 'undertaking'). All of the steps of the intended EA process are discussed in this EA ToR as briefly outlined below.

Chapter 3.0 - Purpose of the Study and Undertaking outlines why the study is being undertaken and presents the problems and opportunities to be addressed.

In **Chapter 4.0 – Description and Rationale for the Undertaking**, an initial *description of the 'undertaking'* is provided. As well, a set of project goals have been developed and are presented. The *rationale for the 'undertaking'* that is to be defined in the EA study, will reflect and capture the project goals. These goals shape the 'undertaking' and provide guidance and direction to the study and project.

The description of *baseline conditions* provides the foundation for the assessment and evaluation of the alternatives. It allows for the potential effects of the project on the environment to be fully understood. In **Chapter 5.0 – Existing Environment and Potential Effects**, an overview description of baseline conditions is provided.

In conducting the EA study, more detailed data collection activities and analyses will be undertaken. The proposed EA work plan is presented in **Appendix A**. It is expected that the EA work plan will be further refined once the EA is initiated.

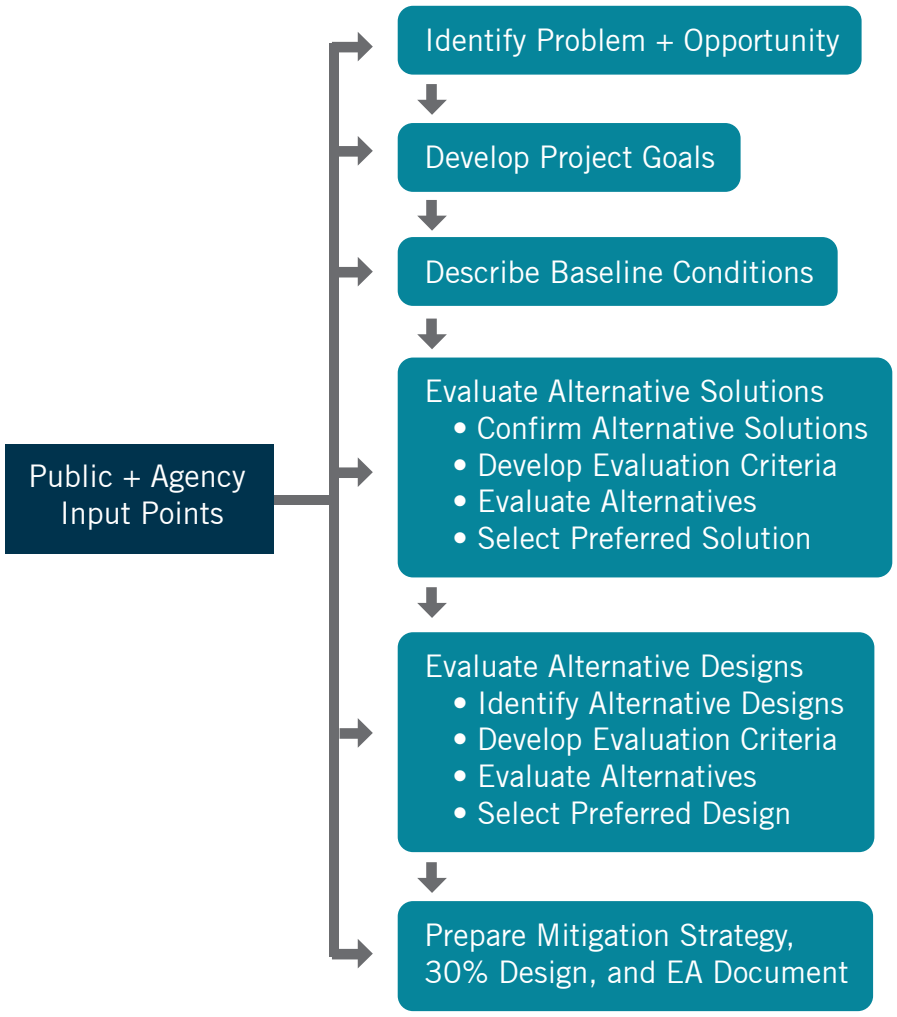
In this EA study, both *Alternative Solutions and Alternative Designs* will be developed and evaluated. As presented in **Chapter 6.0 - Alternatives to be Considered**, four alternative solutions are being proposed for assessment. Preliminary descriptions of these alternative solutions have been provided in this EA ToR. The alternative solutions will be developed and described in further detail in the EA study. The preferred solution, once selected, will then form the basis for the development of alternative designs which will be defined in the EA study.

In **Chapter 7.0 - Assessment and Evaluation Process,** the proposed *evaluation approach* is presented. Both the alternative solutions and alternative designs will be subject to an evaluation process to select a preferred alternative. Four study "lenses" are proposed to provide the structure for the evaluation of the alternatives. The evaluation criteria will be organized on the basis of the study lenses and reflect the project goals. Both the evaluation approach and criteria will be further defined during the EA study process.

Once a preferred design (the 'undertaking') is selected, a mitigation strategy and 30% preliminary engineering and public realm design for the 'undertaking' will be developed.

The EA process provides for *public, stakeholder, agency, and Aboriginal community consultation* at key input points as is illustrated in Figure 2.1. In **Chapter 9.0 - Development of the Consultation Plan**, the proposed plan for consultation during the EA is presented.

Figure 2.1 - EA Study Process



3.0 Purpose of the Study and Undertaking

3.1 Purpose of the Study

The purpose of this study is to determine the future of the eastern portion of the elevated Gardiner Expressway and Lake Shore Boulevard from approximately Lower Jarvis Street to just east of the Don Valley Parkway (DVP) at Logan Avenue.

A number of studies have been conducted regarding the future of the Gardiner Expressway. It has been nearly 20 years since the release of the initial Crombie Commission recommendation to remove the entire elevated Gardiner Expressway, and it is now becoming increasingly difficult to plan and develop the waterfront in the face of this uncertainty. This study is intended to identify a plan of action that can be fully coordinated with other waterfront efforts. While the waterfront can be revitalized with the Gardiner Expressway retained or replaced or removed, a decision is needed now so development can be conducted in a coordinated and comprehensive fashion in this area and other waterfront neighbourhoods. The decision on the Gardiner Expressway and Lake Shore Boulevard pair is an important one that will influence development in the City's waterfront area for many years.

New York, Boston, San Francisco, and Portland are examples of cities that have successfully addressed the challenges presented by aging elevated expressway systems. In each case, changes to such systems have proven to be a catalyst for revitalizing neighbourhoods, enhancing the public realm, and stimulating the city's economy. These case studies and others around the world demonstrate the opportunities afforded by the redesign of single-use pieces of infrastructure into urban elements that provide broader public benefits.

3.2 Purpose of the Undertaking

The purpose of the 'undertaking' is to address current problems and opportunities in the Gardiner Expressway and Lake Shore Boulevard study area. 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. The purpose of the undertaking will be refined and described in more detail in the EA study.

3.3 Problems

3.3.1 Deteriorated Structure

The Gardiner Expressway from Lower Jarvis Street to east of the DVP is an elevated roadway, comprising simple spans supported on steel or concrete bents. The City Transportation Department has been repairing the structure since the 1980s. Except for the two connecting ramps from the DVP to the Expressway, structure rehabilitation was mainly restricted to local patching including the deck and the bridge barriers. Chloride from road salts has already permeated into the concrete components and

caused deterioration of the structure and loss of structural capacities. The recent revisions of bridge codes to address heavier vehicles on our streets also require some structural strengthening where needed and better traffic containment devices (bridge barriers).

This section of the elevated Gardiner Expressway was one of the first few sections rehabilitated in the 1980's and a new round of repairs is again required. This may include comprehensive deck and pier rehabilitation to keep the expressway in a safe and operable condition. It is expected that this investment would be in the order of $50 million over the next 10 years between Jarvis Street and the DVP. The investment cost could be significantly higher if a deck replacement solution is chosen by the City to extend the life of this structure to avoid frequent maintenance.

Some corroded concrete columns have been repaired.

The elevated structure is a barrier.

The railroad viaduct and easement pose a second waterfront barrier.

3.3.2 Disconnected Waterfront

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/Lake Shore Boulevard also acts 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). 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. The project will address this gap.

There are few pedestrian and vehicular connections under the viaduct.

3.4 Opportunities

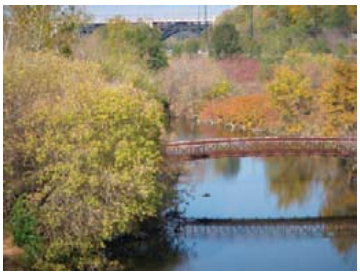
3.4.1 Revitalize the Waterfront

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.

3.4.2 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 catalyses, can be guided and evaluated by sustainable practices.

While environmental 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 Toronto Region Conservation Authority (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.



The Don River is a current site of waterfront environmental restoration.

3.4.3 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.

The waterfront offers multiple revitalization opportunities.

3.4.4 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.

4.0 Description and Rationale for the Undertaking

4.1 Description of the Undertaking

The 'undertaking' will include the proposed changes to the existing Gardiner Expressway and Lake Shore Boulevard from approximately Lower Jarvis Street to just east of the Don Valley Parkway (DVP) at Logan Avenue to address the identified problems and opportunities described previously. A more detailed description of the 'undertaking' will be developed and detailed in the EA study.

Further, while not within the scope of this EA study, consideration will be given to potential opportunities to improve connections across the rail corridor to complement the recommended 'undertaking'.

4.2 Rationale for the Undertaking (Project Goals)

A set of project goals has been developed to provide guidance for the project and to communicate the promise of the project to the larger community. The rationale for the 'undertaking' (project) will be determined and described through the EA process. It will reflect and capture the project goals that have been developed in preparing this EA ToR. These goals will shape the 'undertaking' and provide guidance and direction to the study and project. In particular, it is expected that they will provide guidance to the development of the alternative solutions and designs, the criteria to be used to evaluate the alternatives, and the design of the project or 'undertaking'.

Future configuration and streetscape for Queens Quay, proposed as part of the Central Waterfront.

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.*

Future waterfront esplanade proposed as part of the Central Waterfront.

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.

The five project goals are presented on the following pages. They may be revised during the EA study.

Goal 1: Revitalize the Waterfront

21st Century Waterfront, Chattanooga, TN,

Hudson River Park, New York, NY.

Future precincts on Toronto waterfront.

Proposed waterfront esplanade, Central Waterfront.

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 along 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.
- 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

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 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.
- 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.

East Bayfront Precinct – Existing.

East Bayfront Precinct – Proposed.

East Bayfront Precinct will connect downtown Toronto to the waterfront.

East River Esplanade, New York, NY.

Goal 3: Balance Modes of Travel

Embarcadero Boulevard, San Francisco, CA

Octavia Boulevard, San Francisco, CA

Proposed shared roadway for Queens Quay, Toronto, ON.

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

Goal 4: Achieve Sustainability

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.
- Integrate ecology and natural systems with urbanism.

The High Line, New York, NY.

21st Century Waterfront, Chattanooga, TN.

Lower Don Lands Precinct (proposed), Toronto, ON.

Goal 5: Create Value

Sherbourne Park is a proposed open space connection from upland neighborhoods to the waterfront in East Bayfront Precinct.

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:

- 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. The public sector, through these city-building initiatives, creates value for the community, in terms of streets, open space, and catalysts for private development.
- Maximize net economic and environmental benefits.

View of Gardiner Expressway and the Inner Harbour from the east.

5.0 Existing Environment and Potential Effects

5.1 Study Areas

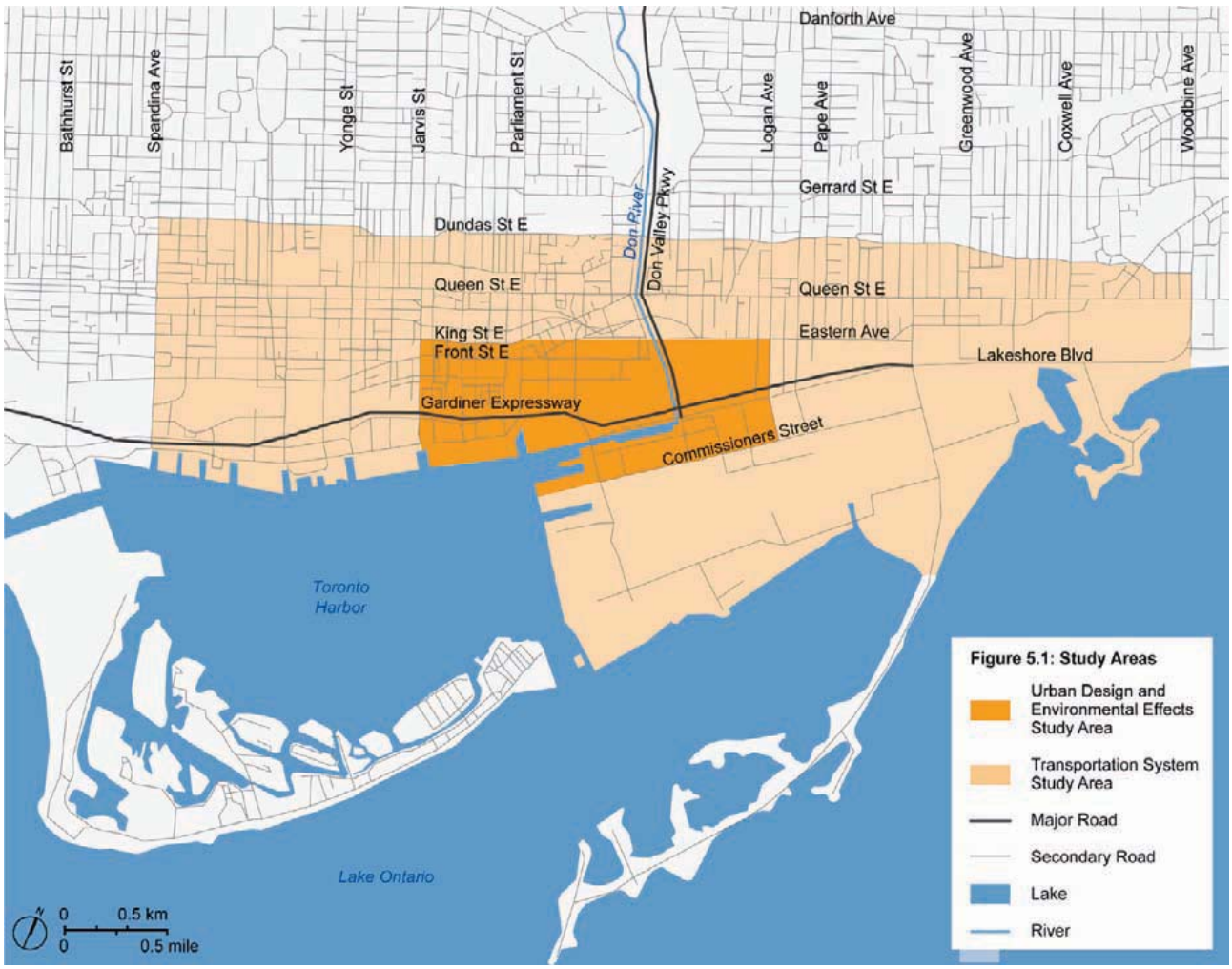
The section of the Gardiner Expressway and Lake Shore Boulevard that is being examined for reconfiguration extends 2.4 km from approximately Lower Jarvis Street to just east of the DVP at Logan Avenue. Two study areas have been initially developed:

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 Logan Avenue. This study area includes three precincts: East Bayfront; West Don Lands; and Keating Channel.

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 and traffic behaviours and modal splits at a city-wide or regional level will also be considered in the transportation assessment.

Figure 5.1 illustrates the study areas. The study areas will be confirmed in the EA and will need to consider the alternatives to be examined and the geographic extent of the potential project effects (negative and positive).

Figure 5.1: Study Areas



5.2 Overview of Existing Conditions

A description of the existing and future environment (baseline conditions) in the study areas will be completed as part of the EA. The description of baseline conditions will provide a context for the EA study, identify the issues that will need to be considered and resolved, and provide the foundation from which alternatives will be assessed and evaluated. With the exception of transportation considerations, baseline conditions will be described for the "Urban Design and Environmental Effects Study Area" as defined above. Transportation conditions will be described for the larger "Transportation System Study Area".

The following provides a summary description of study area baseline conditions. **Figure 5.2** highlights the study area and major geographic reference points.

5.2.1 Transportation and Infrastructure

Figure 5.3

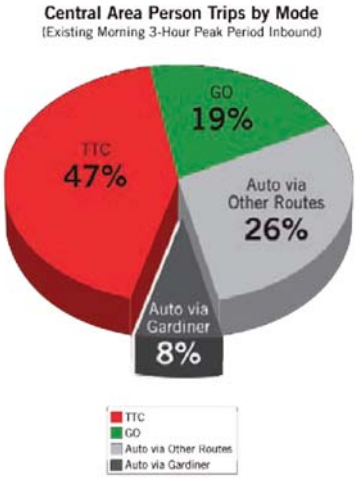


Figure 5.3 shows the percentage of person trips made into the central area of the city by transit or automobile during the morning peak travel period (6am to 9am); eight percent are automobile using the Gardiner Expressway.

Road and Rail

The Gardiner Expressway – Lake Shore Boulevard pair is an integrated system of roadways and ramps providing service to both through and local traffic. The bridge deck is over 40 years old with comprehensive deck and pier rehabilitation required on an annual basis to keep the expressway safe for use. The Gardiner Expressway

extends approximately 18 km from the Queen Elizabeth Way at Highway 427 to Logan Avenue on the east side of the Don River. The majority of the Gardiner Expressway being studied for reconfiguration contains four west-bound lanes and four east-bound lanes and has no shoulder areas in either direction. At the eastern end of the Gardiner, before descending to ground-level, the expressway connects to the Don Valley Parkway, providing an east-west link to the north-south roadway and connecting to the regional road network.

Lake Shore Boulevard East is located beneath the Gardiner Expressway throughout most of this section and is classified as a major arterial street and is a six-lane divided roadway. For the most part, direct access from adjoining land uses to the Lake Shore Boulevard is restricted and intersections with major public streets are controlled by traffic signals.

Figure 5.2: Context Map

West of the downtown core (approximately York Street) and running in both directions, the Gardiner Expressway carries roughly 160,000 cars per day and Lake Shore Boulevard carries roughly 40,000 cars per day. Combined, these routes carry approximately 200,000 vehicles per day west of the downtown. East of the downtown core (west of Lower Jarvis Street) running in both directions, the Gardiner carries roughly 110,000 cars per day and Lake Shore Boulevard carries roughly 13,000 cars per day. Combined, these routes carry approximately 120,000 cars per day east of the downtown. Peak morning hour (approximately 8am to 9am) traffic flow along the section of the Gardiner Expressway proposed for reconfiguration is 5300 vehicles travelling west and 3050 vehicles travelling east. Although busy, the section of the expressway east of Lower Jarvis Street is typically under capacity during the peak hours.

The study area has a vast road network including major and minor arterial streets, collector streets, and local streets.

A series of heavy rail lines run east-west along the north side of the Gardiner/ Lake Shore and include CN Rail lines, rail spur lines servicing local industrial and commercial uses, and multiple GO Transit lines. The area also contains a number of rail yards for handling local industrial rail traffic and GO Transit storage.

Transit

Light rail on King Street.

Public transit services in the study area are operated by GO Transit and the Toronto Transit Commission (TTC). The nearest GO terminal to the study area is located at Union Station, which is also the nearest TTC subway station. Union Station acts as a transportation hub for local, regional and provincial rail and bus services. Currently, plans for improvements to Union Station are in progress, with the number of users anticipated to increase. New regional rail routes are planned between destinations west and north of the city connecting to Union Station. GO Transit operates regional bus services that pass through the study area, and TTC operates a number of local bus and streetcar routes within the study area. The Gardiner Expressway/Lake Shore Boulevard pair is the primary route for regional bus carriers, including GO Transit, to and from the east. Recently there have been proposed changes to the transit system to address TTC routes along King Street, Cherry Street, Sumach Street and Queens Quay. TTC has completed a long term transit plan for Toronto: Transit City. This plan includes seven new light rail transit (LRT) routes throughout the city that will connect to the existing subway system, GO Transit lines, and other Transit City routes.

Bicycle Network

Despite lack of dedicate bicycle lanes, cyclists use the local road network.

There are a number of on-road and off-road bicycle lanes and multi-use pathways in the study area. Included in these are the Don River Trail, bicycle lanes on Eastern Avenue, Parliament and Sherbourne Streets, and lanes and pathways on both sides of Lake Shore Boulevard. The Martin Goodman Trail, which is located just south of Lake Shore Boulevard, is among the most heavily-used recreational and commuter trails in Toronto.[1] Various waterfront revitalization plans include additional bike routes/lanes along Cherry Street, Villiers Street, Queens Quay, Basin Street, and Keating Channel.

Services and Utilities

The area in which the Gardiner-Lakeshore corridor is located is also relatively congested in terms of services and utilities. These facilities consist of watermains, storm and combined sewers, sanitary sewers, gas mains, high voltage power lines and other electrical and communications facilities. Many of the pipe facilities are aged, having been constructed up to 100 years ago. Many older piped services are abandoned, but still in place. Trunk sanitary sewers are located just to the north of the study area, along Eastern Avenue crossing the Don River.[2] Storm sewers outlet to the Don River, the Keating Channel and the Toronto Harbour. Storm sewers, primarily on Lake Shore Boulevard, discharge directly through various storm sewer outfalls or indirectly through CSO trunks that cross the study area and intercept the storm drainage.

Hydro-electric facilities consist of both Hydro One and Toronto Hydro, above and below ground, running along Lake Shore Boulevard and the Don Roadway/DVP.

5.2.2 Urban Design

The elevated structure is a perceived barrier to the waterfront – pedestrians can walk under it, but public realm conditions are harsh.

A number of residential and mixed-use neighbourhoods exist or are planned along the Gardiner Expressway and Lake Shore Boulevard. The Gardiner Expressway, Toronto Terminal Railway/ CN Rail viaduct, and the waterfront are significant physical features giving form to the study area. The relationship of the expressway and rail viaduct to the city presents a barrier between the City and the waterfront.

Relevant Plans and Policies

The King Parliament Secondary Plan and Central Waterfront Plan provide policies for future road patterns, transit routes, natural areas, regeneration areas and

[1] Waterfront Toronto. 2009. *Lower Don Lands Infrastructure Master Plan.* February.
City of Toronto / Toronto Waterfront Revitalization Corporation. 2007. Toronto Waterfront East Bayfront Transit Environmental Assessment Terms of Reference (ToR). August.

[2] Toronto and Region Conservation Authority. *Lower Don River West Remedial Flood Protection Project.* Environmental Study Report. 2005.

redevelopment areas within the study area. The Central Waterfront Plan includes policies for reconfiguring of the Gardiner Expressway and Lake Shore Boulevard, a new waterfront transit network, and the remaking of waterfront streets into "places" with distinct identities. Many of the existing land uses in the study area are industrial/ commercial or vacant brownfields, reflecting Toronto's waterfront history as a port.

As part of the Central Waterfront Plan a number of redevelopment plans for mixed-use communities are being completed. Over the next two decades these districts will transform the waterfront into new communities and will directly influence the urban design and public realm characteristics of the area. These include: East Bayfront (approved plan), West Don Lands (approved plan), and the Keating Channel-Lower Don Lands (plan in progress). Included in the plans for Keating Channel-Lower Don Lands are plans for improving Keating Channel as a recreational waterway, improving flood protection plans, and naturalizing the mouth of the Don River. Flood protection and naturalization plans for the Don River mouth are being completed through a separate EA currently in progress.

Urban design components of the study area include the following physical characteristics:

- Street and Block Network: To the north of the railway viaduct the street grid is dense, fine-grained, and walkable. To the south, the street grid takes on a much larger scale, consisting mostly of local and collector streets. Jarvis, Sherbourne, Parliament, and Cherry Streets are the only north-south streets that connect under the rail viaduct through tunnels, limiting waterfront access for upland neighbourhoods. The street grid also has a larger scale east of Parliament Street. Gardiner Expressway and Lake Shore Boulevard are prominent components in the regional street hierarchy.
- Building Types: The diverse types reflect changing uses and character of the area. These include industrial uses, commercial office towers, and mixed-income residential neighbourhoods of varying densities.
- Open Space: Open spaces in the downtown are currently amongst the lowest in Toronto neighbourhoods and are concentrated in the Old Town of York and St. Lawrence Area. In East Bayfront, there is no public waterfront access from Jarvis to Parliament Streets.[3[1]] New parks and open spaces are being created along the central waterfront (e.g. Don River Park, Sherbourne Park, Waterfront Promenade, etc.).
- Views: The most prominent landmarks for view corridors are the waterfront and Downtown Toronto. The elevated Gardiner Expressway affords views into both. Significant view corridors of the skyline are available from Front Street and Keating Channel. The railroad viaduct and the Gardiner Expressway present a visual barrier to the waterfront. New public spaces are planned for the bottom of Jarvis St., Sherbourne St., Parliament St., and Don River Park and will offer views of the Inner Harbour and Toronto Islands.[4[2]] Queens Quay is also currently being planned as a scenic water-view drive.[5[3]]
- Adjacencies/Edge conditions: There are few natural edges in the study area – boundaries are characterized by infrastructure (Gardiner Expressway and rail

Building types in the Study Area range from residential to mixed-use to industrial.

Parking is a common use on waterfront parcels.

[3[1]] City of Toronto / Toronto Waterfront Revitalization Corporation. 2005. *East Bayfront Precinct Plan.* November.

[4[2]] City of Toronto. 2008. *"Further Report on Removal of the Gardiner Expressway East from Jarvis."* Memorandum. September 26.
City of Toronto. 2003. *Central Waterfront Secondary Plan.* April.
City of Toronto / Toronto Waterfront Revitalization Corporation. 2006. *Toronto Waterfront East Bayfront Class Environmental Assessment Master Plan.* January.

[5[3]] City of Toronto. 2008. *"Further Report on Removal of the Gardiner Expressway East from Jarvis."* Memorandum. September 26.
City of Toronto. 2003. *Central Waterfront Secondary Plan.* April.

The Study Area includes several historic neighborhoods – Old Town of York (top), St. Lawrence (middle), and the Distillery District (bottom).

St. Lawrence neighborhood.

Historic Gooderham & Worts building in the Distillery District.

viaduct), neighbourhoods, and water (Don River, Keating Channel, and the Inner Harbour); and,

- Neighbourhood/District character: Neighbourhood types and districts range from 19th-century industrial enclaves (Old Town of York; Distillery District) to a late 20th-century mixed-income housing development (St. Lawrence).

5.2.3 Environment

Community

According to the 2006 Census, Ward 28 (east of Jarvis to DVP) has a total population of 59,920 people and Ward 30 (DVP to Logan Avenue) has a total population of 51,235 people.[6] In Ward 28, there are 0.5 vehicles per household with 31% of work trips made by auto and 40% made by transit. In Ward 30, there are 0.9 vehicles per household with 49% of work trips made by auto and 38% by transit.[7]

Waterfront redevelopment is projected to increase the Waterfront population from approximately 14,200 persons in 2001 to approximately 103,900 persons in 2021.[8] To address some of this growth, the West Don Lands plan includes 5,800 residential units; the East Bayfront plans include 7,000 residential units; and, the Keating Channel neighbourhood plan includes approximately 4,000 residential units.

Cultural

The history of the study area is rooted in the Euro-Canadian 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. 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. The Don River has also played a critical role in the city's history beginning with First Nations in the 1600s, and expanded with Euro-Canadian industrial settlement. There is no apparent current use of the lands by Aboriginal communities for traditional purposes; however, the Mississaugas of the New Credit First Nation have an accepted Specific Claim which is currently undergoing negotiations with the Federal Government.

Although the precincts within the study area contain a number of significant archaeological and cultural heritage features, the study area has few such features known that overlap the section of the Gardiner Expressway-Lake Shore Boulevard proposed for reconfiguration. The only two located directly along the roadway are Knapp's Roller Boat and the head of the Polson's wharf.[9]

Natural Environment

For the most part, natural environmental conditions in the study area are significantly degraded as a result of past and recent human activities. Natural habitat areas in the study area are primarily located on the Lower Don River, an estuarine habitat, and Lake Ontario. Existing vegetation typically consists of cultural woodlands, thickets, and meadow habitat within a disturbed environment of the lakeshore which includes both native and non-native vegetation. The Don River has been reconfigured and altered over the years and now drains into the Keating Channel.

The mouth of the Don River will be naturalized while the risk due to flooding from the Don will be eliminated (up to the Regulatory Flood) as part of the *Don Mouth Naturalization and Port Lands Flood Protection Project*. The elimination of the flood

[6] City of Toronto. "2006 City of Toronto Ward Profiles: Ward 28 Toronto Danforth Profile." Retrieved March 25, 2009. http://www.toronto.ca/wards2000/ward28.htm.
[7] City of Toronto. "2006 City of Toronto Ward Profiles: Ward 30 Toronto Danforth Profile." Retrieved March 25, 2009. http://www.toronto.ca/wards2000/ward30.htm.
[8] Toronto Waterfront Revitalization Corporation and City of Toronto. West Don Lands Class Environmental Assessment Master Plan. March 2005.
[9] Waterfront Toronto and Archaeological Services Inc. Waterfront Toronto Archaeological Conservation and Management Strategy. 2008.

risk will be achieved through a combination of cut and fill to create a new river valley and channel, and through the construction of other engineered flood protection structures.

Storm drainage from the study area discharges to various surface water bodies including the Don River, the Keating Channel and the Toronto Harbour. With the exception of management practices such as street sweeping and sediment traps on the Gardiner Expressway collection system, discharges occur without any stormwater management quantity or quality controls. Modifications to stormwater systems are planned for West Don Lands, East Bayfront and Lower Don Lands, including provisions for stormwater treatment to meet the City of Toronto's Wet Weather Flow Management Master Plan (WWFMMP).

The Don River is undergoing restoration.

Soil and Groundwater

Locally, the overburden soils consist of 8 to 10 m of fill placed through historical lakefilling during the late 19th and early 20th centuries. Groundwater is generally found within 1 to 2 m of ground surface within the fill materials. Materials lakefilled included dredged sediment and construction debris, excavated soil, sewage sludge, incinerator refuse, timber, concrete, and municipal garbage. Investigations in the study area have revealed that the fill materials contain varying amounts of cinders, coal tar and other industrial byproducts.[10]

Subsurface contaminants that are of concern and potentially present in the study area are those associated with the quality of fill, industrial operations and historical harbour operations. Soil and groundwater investigations have detected surface or near-surface soil and groundwater impacted at levels exceeding the MOE industrial/commercial standards. Exceeded parameters include petroleum hydrocarbons (PHCs), polyaromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and various metals. Previous assessments conducted in the general area, have identified the potential for methane gas generation within the site soils, either fill materials or the native lake bottom sediments.[11]

View of Lower Don Lands and Gardiner Expressway from the south-east.

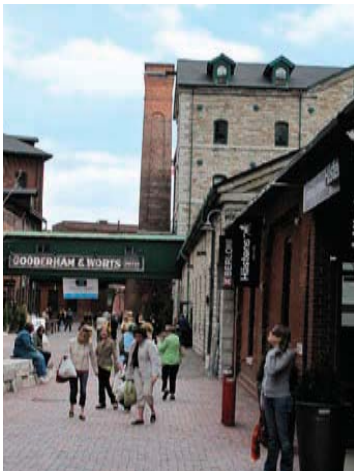
Air and Noise

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 ground water conditions also impact air quality. Due to Toronto's dense population, large number of vehicles, industry, light winds, and summer temperatures, the city provides good conditions for the formation of ground-level ozone and thus air-quality issues arise periodically. In 1999 a study that involved ambient air quality monitoring and atmospheric dispersion modelling for three Gardiner Expressway reconfiguration scenarios was conducted.[12] The monitoring showed that some forms of particulate matter exceeded the MOE's health-based Ambient Air Quality Criterion (AAQC).

The existing acoustic environment in the study area is influenced by noise generated by road, rail, and marine traffic, loading and unloading of vehicles, 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 MOE, that is "an area with an acoustical environment typical of a major population centre, where the background noise is dominated by the urban hum."[13]

View of Lower Don Lands and Gardiner Expressway from the south-east.

[10] Toronto Waterfront Revitalization Corporation and City of Toronto. *East Bayfront Class Environmental Assessment Master Plan*. January 2006
[11] Dillon Consulting Limited. "Phase II Environmental Site Assessment, TEDCO Lands East Bayfront." May 2008.
[12] SENES Consultants Limited. "Air Quality Assessment of Various Options for the Future of the F.G. Gardiner Expressway East Phase III." May 1999.
[13] MOE, 1995: NPC-205 Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban).



The Distillery District and St. Lawrence Market are examples of neighborhood destinations that advance economic development.

West Don Lands, East Bayfront and Keating Channel areas.

5.2.4 Economic Base

Employment and Business Activity

In Ward 28, 61.5% of the population are employed and 73.4% of them work in the City of Toronto.[14] In Ward 30, 63.3% of the population are employed and 71% of them work in the City of Toronto.[15] As the City grows, the number of jobs along the waterfront is projected to increase from 38,200 to 78,200 from 2001 to 2021.[16]

Currently, business activity surrounding the study area is dominated with industrial and commercial activity, and scattered entertainment, film and cultural businesses. The central business district of downtown Toronto is located just to the west of the study area.

Redevelopment in the study area over the next two decades will significantly increase employment and business opportunities. Plans include:

- West Don Lands, which is an approved plan including 750,000 square feet of employment space with the ability to accommodate up to 4000 jobs[17];
- East Bayfront, which is being planned as a prime site to attract significant new employment to the city. The new district will have jobs for 8,000 people, and one million square feet of commercial space [18]; and,
- Keating Channel-Lower Don Lands, which is being planned with approximately 1.8 million square feet of commercial/non-residential development.[19]

Tourism and Recreation

The City's downtown and waterfront are primary recreation and tourism resources, with parks, boating activities, hotels and arts and culture venues. Key recreational trails and open spaces include the Don River, Cherry Beach, Leslie Street Spit, Tommy Thompson Park, Harbourfront and in neighbourhood pockets such as St. Lawrence and David Crombie Park.

5.3 Potential Environmental Effects of the Undertaking

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. While the nature of the effects will depend on the design of the proposed 'undertaking' (and mitigation opportunities), the following provides a preliminary listing of the types of positive and negative effects that could occur for the project.

Potential Positive Effects/Benefits

- Enhanced urban form;
- Improved connection to the lake from the downtown;
- Creation of new streetscapes and public spaces;
- Opportunity for improved pedestrian connections;
- Creation of new or improved cycling facilities;

[14] City of Toronto. "2006 City of Toronto Ward Profiles: Ward 28 Toronto Centre Rosedale Profile." Retrieved March 25, 2009. http://www.toronto.ca/wards2000/ward28.htm.
[15] City of Toronto. "2006 City of Toronto Ward Profiles: Ward 30 Toronto Danforth Profile." Retrieved March 25, 2009. http://www.toronto.ca/wards2000/ward30.htm.
[16] Toronto Waterfront Revitalization Corporation and City of Toronto. West Don Lands Class Environmental Assessment Master Plan. March 2005.
[17] Toronto Waterfront Revitalization Corporation and Urban Design Associates. West Don Lands Precinct Plan. May 2005.
[18] Toronto Waterfront Revitalization Corporation et. al. East Bayfront Precinct Plan. November 2005.
[19] Waterfront Toronto. Keating Channel Precinct Plan, Draft. March 2009.

- Increased use of other modes of travel including transit;
- Enhancement of other naturalization efforts;
- Reduced greenhouse gas generation;
- Enhanced land redevelopment opportunities;
- Improved quality of surface water runoff;
- Increase in adjacent land values;
- Activation of existing and planned waterfront neighbourhoods;
- Increase in economic activity within the study area, the city, and the region;
- Employment generation; and
- Increase in tax revenues to the city, province and Federal government.

Potential Negative Effects

- Increased traffic travel times;
- Reduced connectivity in regional traffic movement;
- Increased traffic volumes in other communities;
- Change in traffic and public safety levels (during operation and construction);
- Effects on emergency service response times;
- Effects to city infrastructure including railways and utilities;
- Effects to property access;
- Change in ambient noise levels (could be negative or positive);
- Change in ambient air quality conditions (could be negative or positive);
- Vibration related effects;
- Potential health effects (due to changes in air quality – could be a positive effect);
- Disruption in use of recreation features;
- Effects on business activity due to changes in access and/or disruption effects (i.e. during construction);
- Effects to stormwater quantity, quality and drainage;
- Change in the flood risk and effects to planned initiatives to address flooding in the Port Lands and South Riverdale areas;
- Change in ability to manage sediment and debris in the Don River;
- Effects to built heritage features; and,
- Effects to archaeological resources.

In contrast to some other EA studies, which seek to limit or scope the number of alternatives to be considered, the Gardiner Expressway and Lakeshore Boulevard Reconfiguration EA will bring a broad but defined range of options forward for study.

6.0 Alternatives to be Considered

In the EA, both alternative solutions and alternative designs will be developed and evaluated in the EA study (See **Figure 2.1** for an overview of the EA process). **Alternative solutions** (also known as 'alternatives to' under the Ontario EA Act) are the functionally different ways of solving the problem and/or taking advantage of an opportunity. For road infrastructure projects, "alternatives to" could include different forms of transportation modes such as: transit (local and regional), road improvements, active forms (walking and cycling), and transportation demand management measures.

The alternative solutions will be subject to evaluation and a preferred solution will be carried forward. See **Section 7.0** for a description of this evaluation process. The preferred solution will form the basis of the **alternative designs** (also known as "alternative methods" under the Ontario EA Act). At the conclusion of the EA process, a preferred alternative design will be recommended to the MOE for implementation.

The alternative solutions and designs to be considered in the EA will be limited to "land based" travel modes and to those physically located in the study area. They will be developed to accommodate a transportation planning horizon year of 2031.

The following describes the approach to be followed in the EA to develop both the alternative solutions and alternative designs.

6.1 Alternatives Solutions (Alternatives to the Undertaking)

For this EA, the alternative solutions ("alternatives to") will include a description of the Gardiner Expressway and Lake Shore Boulevard reconfigurations to address both the previously outlined problems and opportunities.

Waterfront Toronto and the City have undertaken studies in the past to examine potential alternatives for the reconfiguration of the Gardiner Expressway and Lake Shore Boulevard. These studies have included the development of conceptual designs to better understand the technical feasibility of and challenges to implementing the alternatives. Further, as part of this study, a case study analysis was undertaken that examined how other cities around the world have dealt with their aging elevated roadways. The March 2009 draft report that documents these cases studies is available on the project website: (www.GardinerConsultation.ca).

Based on this past work, as well as the input obtained through the EA ToR public and agency consultation process, four alternative solutions have been identified, including:

Alternative 1:"Do Nothing" (maintain the elevated expressway)

Alternative 2: Improve (the elevated expressway)

Alternative 3: Replace (with a new expressway)

Alternative 4: Remove (the elevated expressway)

These alternatives represent the range of alternatives available to address the problems and opportunities described in Sections 3.3 and 3.4. While four alternative solutions have been identified, it is possible that others could be identified and added for further consideration based on the public and agency consultation activities to be undertaken in the EA.

The alternative solutions will be further defined in the EA study. The following outlines some of the elements that would be described for each alternative solution:

- 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 reconfigurations;
- 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;
- To address potential reductions in road capacity with some options, opportunities to encourage/improve other modes of transportation (e.g. transit) and manage changing traffic patterns would be considered; and,
- Opportunities to improve the local environment through reduction in ongoing effects (e.g. stormwater quality), flood protection, and naturalization initiatives would be considered.

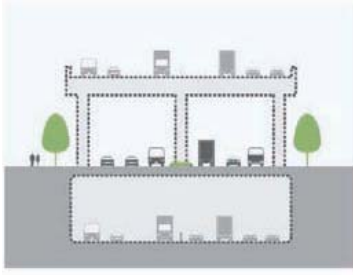
Finally, for each alternative solution there could be a large variation in the nature of its impacts and benefits. As an example, for the 'Replace' option, the nature of impacts/ benefits could vary significantly whether the replaced expressway function is located above or below ground. The approach to dealing with this potential variation will be developed in the EA.

Alternative 1: "Do nothing" (maintain the elevated expressway)

The EA Act requires the consideration of the 'Do Nothing' alternative which serves as a base to compare against the other alternatives. The 'Do Nothing' alternative maintains the status quo, including the potential for significant maintenance costs of the elevated Gardiner Expressway deck and piers/support structure. Based on City estimates, these costs are expected to total $50 million over the next ten years, and do not include major structural improvements (e.g. deck replacement) or any architectural or urban design enhancements.

Alternative 2: Improve (the elevated expressway)

The second option is the "Improve" alternative, in which the elevated expressway function would be retained, but modifications to its configuration, as well as to Lake Shore Boulevard underneath, would be made as well. These could include initiatives such as: the addition of an architecturally significant "wrapper" around the structure or suspended from its underside, re-cladding or relocation of the structural piers/supports to improve pedestrian, vehicular, and possibly transit flow on Lake Shore Boulevard, "greening" the Gardiner Expressway; and relocation or elimination of one or more on- and off-ramps to remove physical barriers to north-south crossings.



Alternative 3: Replace (with a new expressway)

The third option is the "Replace" alternative, in which the existing elevated expressway structure would be eliminated, but the expressway function would be retained through construction of either an at-grade, limited access expressway, buried in a tunnel, or reconstructed above ground (e.g. proposal for a new elevated expressway above the rail corridor).

Alternative 4: Remove (the elevated expressway)

The fourth option is the "Remove" alternative, in which the elevated expressway function would be eliminated and replaced with a lower-capacity, lower-speed facility. Waterfront Toronto has publicly recommended this alternative, but as a co-proponent with the City, owner of the roadway, it is committed to conducting a fair and unbiased evaluation of all the options. This alternative would involve removing the elevated structure and reconfiguring Lakeshore Boulevard into a "grand street".

6.2 Alternative Designs (Alternative Methods of Carrying out the Undertaking)

Once a preferred alternative solution is selected (See Section 7.0 for an outline of the evaluation process), the next step will be to develop the alternative designs (also known as 'alternative methods') for that preferred solution. The alternative designs are the different ways of implementing the preferred solution and are expected to include varying forms and locations for infrastructure.

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. 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. Various transportation solutions (including non-auto solutions) may be required to address road capacity reductions created by the preferred solution.

The range of alternative designs to be developed will depend on the preferred alternative solution that is selected. For each alternative design, plans would be developed to illustrate in detail its various components and their location, and how it would be implemented.

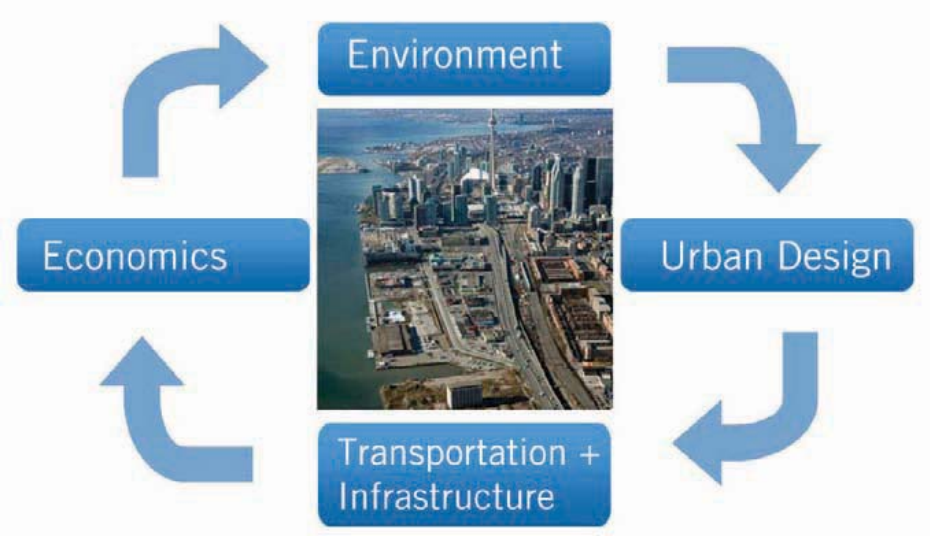
7.0 Assessment and Evaluation Process

7.1 Introduction

This section describes the proposed process to be followed to evaluate both alternative solutions ('alternatives to') and alternative designs ('alternative methods'). While it is recognized that EA approval is only required for the road related infrastructure components of the project or 'undertaking', the alternatives will be evaluated in terms of their ability to address transportation considerations and city building opportunities along with environmental and economic considerations.

7.2 Four Evaluation "Lenses"

Urban Design, Transportation & Infrastructure, Environment and Economics are the four "lenses" that will provide the structure for the evaluation of the alternatives in the EA. 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. The four lenses are described below.



Transportation and Infrastructure Lens – focuses on accommodating person-trip activity and non-discretionary vehicular trip-making including goods movement and through travel. Addresses potential effects on other infrastructure, including utilities and rail facilities, and issues relating to project constructability.

Urban Design Lens – focuses on the creation of opportunities for improved urban form and improved or new public realm/open space.

Environment Lens – focuses on the minimization of negative effects on the environment (social, cultural and natural) and natural environment enhancement opportunities.

Economics Lens – focuses on achieving a balance of project costs with project financial benefits that could include increased land values and benefits to the economy.

7.3 Evaluation Process Steps

The approach to the study process was previously presented in **Figure 2.1**. The project goals provide the basis from which alternatives are developed, assessed and evaluated **(Section 4)**. Two assessment and evaluation phases are envisioned: **1) alternative solutions** (the "alternatives to") and **2) alternative designs** (the "alternative methods"). Each of the two evaluation phases will follow three steps:

1. Develop evaluation criteria;
2. Assess potential effects and benefits; and,
3. Evaluate alternatives and select the preferred alternative.

These steps are described below:

Step 1. Develop Evaluation Criteria

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. These criteria and indicators will be organized on the basis of the four study lenses and ten criteria groups (see **Table 7.1**).

This EA ToR does not include the specific evaluation criteria to be used, but rather presents some examples to illustrate the types of criteria that would be developed during the EA process (see **Table 7.1** for example criteria). Waterfront Toronto and the City consider it important to undertake as part of the EA study a comprehensive consultation process on the criteria prior to applying them.

It is noted that the criteria set used in the evaluation of alternative solutions may be revised for the evaluation of alternative designs.

Step 2. Assess Potential Effects and Benefits

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. Qualitative and quantitative data collected will be presented in a manner (e.g. table format) to allow the differences among the alternatives to be easily compared.

The effects assessment will need to consider the potential for effects on both the existing environment as well as the expected future conditions of the study area (as is reflected in current plans and proposals). Also to be considered in the evaluation are mitigation measures that could be implemented to reduce the effects; as such the evaluation will consider the residual or "net" effects of each alternative.

Step 3. Evaluate Alternatives and Select the Preferred Alternative

Once the potential effects for each alternative are identified, the alternatives would then be compared relative to one another to determine on balance, what alternative has the most advantages and least disadvantages. To facilitate this, the project team will need to:

1. Determine the relative importance of the criteria groups/criteria;
2. Determine the order of preference ranking of the alternatives by criteria and/or criteria group; and,
3. Select and apply an appropriate evaluation methodology.

Regarding the first step, an exercise to determine the relative importance of the criteria group/criteria will be undertaken with input from stakeholders. The values of the affected communities would need to be considered in this process. The need for and the means to obtain this input, and there could be several, will be determined in the EA. This could include, for example, a workshop type event where participants provide their input through the completion of a workbook and through small group discussions. Opportunities for input through E-consultation may also be possible.

In the second step, the project team will evaluate and determine the relative order of preference of the alternatives for each individual criterion/criteria group (i.e. from most to least preferred). Both the negative and positive effects of each alternative would be considered.

The third and final step involves making the tradeoffs among the alternative preference rankings by criteria group/criterion. To do this requires the use of an appropriate evaluation method. The selection of this method depends on many considerations including for example:

- the number of criteria/alternatives;
- the type, nature and complexity of the data set;
- the degree of variation among the alternatives; and,
- level/form of stakeholder input.

It is anticipated that a mix of quantitative (numerical) and qualitative data would be collected; as such, it would not be possible to use a quantitative or numerical evaluation method. It is therefore proposed that the evaluation be conducted through a qualitative "paired-comparison" approach that would make trade-offs through reasoned argument. Under this approach, the alternatives would be evaluated in sets of two or pairs. The preferred alternative of each paired comparison is carried forward until an alternative is identified as being preferred over all the other alternatives. For the preferred alternative, mitigation measures to reduce the effects and the residual or "net" effects of the undertaking will be described.

Table 7.1:
Proposed Evaluation Criteria Groups

Study Lens	Criteria Group	Definition	Example Criteria
Transportation & Infrastructure	Transportation	The reconfiguration alternatives have the potential to affect travel flow (including automobile and local and regional transit) through the area and downtown, particularly commuter traffic. This 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.	• Compare ability to accommodate local and through travel needs • Compare level of connectivity between the DVP and the Gardiner Expressway • Compare and measure north-south pedestrian movement
	Infrastructure	Focused on issues that relate to the construction of new road infrastructure and the potential for impacts on existing utilities such as sewers and watermains, and rail infrastructure.	• Compare level of construction complexity
Urban Design	Urban Design	Opportunity for improved urban form and connections between downtown and the waterfront.	• Compare opportunity for development of an enhanced urban form
	Public Realm	Opportunity for creation of high quality public realm space within the Gardiner Expressway study area.	• Compare opportunity for creation of new public realm lands
	Land Use	Effects on existing and future land uses within the study area.	• Compare level of consistentency with existing City initiatives, policies and plans
Environment	Social, Health, Recreation and Business	There is potential for effects to existing and future residents, public health, businesses and recreation facility users in the area as a result of roadway construction and operation activities. Included is the consideration of potential public health effects and the potential for health quality enhancement.	• Compare changes to air quality and potential for health effects from changes in traffic volumes / patterns • Compare opportunity to create new / enhanced recreation opportunities
	Natural Environment	Potential for effects on the existing environment as well as the potential to create opportunities for environmental enhancement (e.g. improved stormwater quality). Also to be considered is the need to minimize impacts on the initiatives of other environmental enhancement efforts (e.g. Don River Mouth Naturalization and Flod Protection EA).	• Compare ability to accommodate plans for environmental naturalization • Compare ablity to accommodate flood storage / protection plans in the Don River mouth area
	Cultural Resources	Potential for impact on archaeological resources, built heritage features and cultural landscapes. As much of the study area consists of lake fill, the potential for archaeological resources is limited. There is some potential for effects on built heritage features that related to the industrial history of the area.	• Compare opportunity to enhance cultural landscapes

Table 7.1:
Proposed Evaluation Criteria Groups

Study Lens	Criteria Group	Definition	Example Criteria
Economics	Capital and Operating Costs	Includes the initial project construction and long-term operating cost estimates.	• Compare estimated capital and long term maintenance cost for the alternatives
	Direct Economic Benefits	The project is expected to create new opportunity for land development, increased surrounding land values, city revenue from increased taxes, economic activity; and employment generation.	• Compare opportunities for enhanced land development in area

8.0 Development of A Monitoring Strategy and Schedule

Waterfront Toronto and the City will prepare a comprehensive list of commitments during the EA process. The EA commitments could include impact management measures, additional works and studies to be carried out, monitoring plan, public consultation, and documentation.

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. Compliance monitoring is an assessment of whether an 'undertaking' has been designed, constructed and operated in compliance with the commitments in the EA Document and conditions of EA Act approval. Effects monitoring consists of activities carried out after approval of the 'undertaking' to determine the environmental effects of the 'undertaking'.

9.0 Development of the Consultation Plan

9.1 Consultation in Preparation of the EA Terms of Reference

At the outset of the study process, a Consultation Strategy was prepared to guide public and agency consultations during the development of the Draft EA ToR. Waterfront Toronto and the City, along with representatives of the consulting team and a neutral third party facilitator participated in developing and implementing the Strategy. Consultation with the public, government agencies and ministries, and other interested persons was undertaken from March to May 2009. **Table 9.1** outlines the key consultation activities that were conducted during the preparation of the Draft EA ToR.

Further, in May 2009 the Draft EA ToR was sent to the Government Review Team for their review and comments and placed on the project web site for the public to review. In May 2009, the Draft EA ToR was made available and considered at the June 2009 City of Toronto Executive Committee meeting, which provides opportunities for public deputations. In August 2009 Toronto Council provided authorization to submit the ToR to MOE for aproval.

A detailed summary of the consultation undertaken during the preparation of the Draft EA ToR, including a summary of the comments received, is provided in the *Record of Consultation*, under separate cover.

Comments recieved on the Draft EA ToR, and the co-proponents responses to these comments, is contained in **Appendix B**.

Table 9.1:
Key Consultation Activies for EA ToR

Component	Approach
Notice of Commencement (NOC)	The NOC was published in March 2009. It announced the project start-up, described the dual focus on urban design and infrastructure, defined the study area, and promoted Public Forum #1.
Workshop #1: Stakeholder Orientation Workshop #2: Feedback on Key Elements of EA ToR	Workshop #1 was held on March 12, 2009 to introduce stakeholder representatives to the project, the rationale for undertaking it, the proposed process and timelines. The workshop also enabled early stakeholder feedback on ideas, opportunities and issues. Workshop #2 was held on May 2, 2009 to present key elements of the EA ToR and receive stakeholder input.
Public Forum #1	Public Forum #1 introduced the project, rationale, process and timelines, and case studies. Four meetings were held on the following dates: March 28, 30, April 2 and 4.
Public Forum #2	Public Forum #2 was held to present and seek feedback on key components of the EA ToR, including: Goals, Alternative Solutions, Evaluation Process and Criteria Groups, and approach for EA Consultation. Four meetings were held on the following dates: April 23, 25, 27 and 28.
Web-based Consultations	A web-based portal (www.gardinerconsultation.ca) was established to enable online consultation. Two rounds of e-consultation took place during the development of the Draft EA ToR, mirroring the face-to-face consultations in Public Forum #1 and #2.
Meetings with Specific Stakeholders	The Project team attended meetings when invited by specific organizations as appropriate.
Aboriginal Community Consultations	An approach was developed specifying when and how Aboriginal communities and relevant government departments should be contacted and consulted as the EA study progresses. Notification of the study commencement was provided to organizations.
Input Management and Reporting	A "One-window" point of contact for the project was established, with a dedicated phone/fax/email and a link to the consultation web portal. The "Neutral Community Facilitator's Office" is a customer service centre that provides basic information about the project and a focal point for receiving questions / comments and providing responses.

9.2 Process for Consultation During the EA

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. Waterfront Toronto and the City recognize the importance of engaging stakeholders and the public to provide multiple and ongoing opportunities for feedback throughout the upcoming EA.

Although the EA process specifies certain mandatory points of contact, the level of effort for consultation depends on the complexity of the project being considered and the needs of the public (such as the level of interest and concern). Consultation activities may not be limited to what is described in this section. As the project

moves through the EA process, Waterfront Toronto and the City may consider additional enhancements to the consultation plan. Consultation will be undertaken in accordance with the Ontario EA Act.

Consultation for this EA is based on the following Guiding 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.

Public Information Centers offer opportunities for a range of stakeholders to provide project input

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.

9.2.1 Government and Agencies

A Technical Advisory Committee has been established to provide input at key milestones during the EA process. It includes representatives from various City of Toronto Departments, TTC, GO Transit/Metrolinx, and TRCA. A Government Review Team (GRT) has also been established to review EA documentation (draft and final).

9.2.2 Aboriginal Communities

Waterfront Toronto and the City are committed to Aboriginal community Consultation. 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. 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. Individual meetings will be offered to each Aboriginal communities (including the option to travel to Aboriginal communities for the meeting). Interested Aboriginal communities will be contacted and asked for feedback around each round of Public Forums.

9.2.3 Public and Stakeholders

Public Forums

Public forums will provide an opportunity for the public to give feedback and comments on study components, results, and ideas as they develop over the course of the study. The format will include: panel displays; presentations; small table discussions/ feedback on key questions.

Web-Enabled Consultations

A web-based portal (www.gardinerconsultation.ca) has been established to enable online consultation as the study progresses. This consultation website was established in the EA ToR phase and will continue throughout the EA. The e-consultations will mirror the face-to-face consultations at Public Forums. The web-portal will also include any final published background reports, individual study reports, and public notices as they are developed.

Stakeholder Workshops

Interactive workshops will be convened to seek input from stakeholder representatives on key issues and opportunities during the project.

Face-to-face Meetings

The Project Team will attend meetings when invited by specific organizations, as appropriate.

Input Management and Reporting

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 web portal. 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.

Stakeholder Advisory Committee

The mandate of the Stakeholder Advisory Committee (SAC) is to provide an ongoing forum for feedback, guidance and advice to the Project Team at key points during the EA process. It is proposed to establish the SAC at the outset of the EA.

Notice of Completion

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.

Table 9.2 summarizes the EA consultation and communications activities in the three major phases of the EA process.

Table 9.2: EA Consultation and Communications Activity Summary

	Identify and Evaluate Alternative Solutions	Identify and Evaluate Alternative Designs	Effects Assessment, Mitigation & EA Documentation
CONSULTATION	√		
• Stakeholder Advisory Committee Formation			
• Stakeholder Advisory Committee Meetings	√	√	√
• Technical Advisory Committee Meeting	√	√	√
• Public Workshop	√	√	√
• Public Forum	√	√	√
• Online Consultation	√	√	√
• Additional face-to-face Meetings (as necessary)	√	√	√
• Aboriginal Community and Agency Consultation	√	√	√
• One-Window Consultation and Issues Response	√	√	√
COMMUNICATIONS	√		
• Notice to apply to participate on SAC			
• Notice of acceptance to SAC participants	√		
• SAC meeting invitations, meeting documents and presentations	√	√	√
• Workshop invitation, meeting documents and presentations	√	√	√
• Public Forum notice, and display boards	√	√	√
• Website updates	√	√	√
• Advertisements	√	√	√
DOCUMENTS	√	√	√
• Workshop meeting summary			
• SAC meeting minutes	√	√	√
• Public Forum summary	√	√	√
• Additional meeting minutes	√	√	√
• Website consultation report	√	√	√

9.3 Record of Consultation and Supporting Documents

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.

10.0 Modifications During the EA Process

This EA ToR has a wide scope, providing room for flexibility in the EA process in order to accommodate potential circumstances that could prevent the commitments of the EA ToR from being met. It is understood that once the EA ToR is approved by the Minister that it cannot be amended. With the complexity of this project, it is important to provide flexibility in the EA study design in order to modify the EA process as issues arise. For this reason, the EA ToR has not established specifics for the alternatives, detailed existing conditions, or provided the final evaluation criteria groups, criteria, or indicators. These will be determined in the EA as the details of the project are defined.

11.0 Other Approvals Required

In addition to the MOE EA approval and as the proposed EA evolves, the need to obtain other approvals may arise. The *Canadian Environmental Assessment Act* (CEAA) is triggered if a Federal department provides funding, grants an interest in Federal land, or exercises a regulatory duty (i.e. issuing permits, approvals or authorizations) for the project. The need for CEAA approval will depend on whether one of these triggers is present. Additional required approvals will depend on the final 'undertaking' that is proposed and will be detailed in the EA. Approvals from Federal, provincial and municipal agencies may be required.

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Appendix A

Proposed EA Work Plan

Appendix A – Proposed EA Work Plan		
Study Component	**Sub-Components**	**Proposed Work Scope (to be confirmed in the EA)**

Stormwater/Municipal Services	Utilities; Stormwater Management; Flood Control	• Review and/or assess background information, including:
		  • Storm and sanitary sewers, including inspection records and condition ratings
		  • Existing utilities plans
		  • Background documents completed for recent study area precinct plans and the Don Mouth Naturalization and Port Lands Flood Protection Project – including planned and proposed modifications and improvements
		  • Flood plain mapping and existing and planned protection facilities
		• Provide input to the functional plans and the 30% design for road infrastructure

Socio-Economics	Residential; Employment; Emergency Services; Recreation; Tourism	• Review and/or assess background information, including:
		  • Historical, existing and planned/proposed land uses
		  • Property ownership
		  • Business activities
		  • Existing and proposed trail networks and recreational facilities
		  • Existing and proposed tourism destinations
		• Assess socio-economic effects of alternatives and proposed 'undertaking'

Archaeology/Heritage	Built Heritage; Cultural Landscapes; Archaeology	• Review and/or assess background information, including:
		  • Ontario Archaeological Sites Database and City of Toronto Archives
		  • Waterfront Toronto Archaeological Conservation and Management Strategy
		  • Available primary and secondary sources
		• Assess cultural resource effects of alternatives and proposed 'undertaking'

Soils/Geo-Environmental		• Review site investigation reports, remediation reports, existing Records of Site Condition and existing regulatory Orders and Directives, and geo-technical information • Prepare property specific inventory of geo-environmental and geo-technical information. • Assess soil and groundwater contamination • Assess permeability and load bearing capacity of in-situ soils
Noise and Air Quality	Noise, Vibration, Air Quality, Public Health	• Regarding Noise: • Establish existing background noise levels at select receptors through monitoring and/or modelling

Appendix A – Proposed EA Work Plan		
Study Component	**Sub-Components**	**Proposed Work Scope (to be confirmed in the EA)**
Urban Design, Public Realm, and Land Use	Relationship to Existing City Plans; Urban Form and Character; Public Realm; Users; Microclimate	• Assess regulatory framework - plans, policies, bylaws • Assess physical constraints on development – including the local development market and recent development applications • Prepare master plan land development layouts as part of the alternatives development • Develop urban design and 30% public realm design for the preferred alternative design
Transportation	Transit; Cyclists; Pedestrians; Vehicles; Goods Movement; Road Safety	• Review current and planned transportation initiatives and policies (Transit City, MoveOntario 2020, The Big Move, City of Toronto Bike Plan: Shifting Gears, etc.) • Complete an initial macro-demand forecasting exercise using EMME/2 model for each alternative • Complete micro-simulation modeling using Paramics software for each alternative • Prepare non-auto/transit solutions as part of the alternatives development • Develop the transportation strategy that will complement the preferred alternative design

Natural Environment	Terrestrial; Aquatic; Wildlife; Water Quality	• Review and/or assess background information, including:
		  • Recent study area precinct plans and the Don Mouth Naturalization and Port Lands Flood Protection Project
		  • Toronto and Region Conservation Authority (TRCA) previous species inventory studies; aquatic monitoring programs; and wildlife inventories
		  • Ecological land classification
		  • Provincial Monitoring Water Quality Network
		• Assess natural environment effects of alternatives and proposed 'undertaking'

Infrastructure	Roadways; Structures; Railways	• Review and/or assess background information, including:
		  • Plans and profiles of roads and structures; and as-constructed structural drawings for the Gardiner Expressway and other major structures
		  • Study area precinct plans and planned and proposed modifications and improvements from other EA studies
		  • Railway infrastructure, including overhead and buried facilities
		  • Geotechnical and foundations information
		• Prepare functional plans for road infrastructure as part of alternatives development
		• Complete a 30% road infrastructure design for the preferred alternative design

Appendix A – Proposed EA Work Plan		
Study Component	**Sub-Components**	**Proposed Work Scope (to be confirmed in the EA)**
		• Conduct an acoustic assessment for each alternative using the MOE STAMSON road traffic model and/or CADNA-A acoustic model • Compare acoustic assessment outcomes for each alternative to MTO and MOE noise requirements • Regarding Air Quality: • Review available air quality reports completed in study area and for the City of Toronto • Conduct background ambient air monitoring at 3 locations for a duration of approximately 6 months • Conduct air quality impact assessment for each alternative using computer modeling tools: MOBILE 6.2C and CAL3QHCR
Cost/Financial Analysis	Costing; Real Estate Value Creation	• Review market analysis background documents • Review and assess recent sales data and real estate conditions • For alternatives solutions stage, develop Order-of-Magnitude estimates for: capital investments for each alternative, infrastructure investments, land and real estate investments, direct and indirect return to the public sector, and public value creation. A high level cost-benefit analysis model to be used to identify relative economic value of each alternative on a net present value (NPV) basis • Complete a more in-depth market analysis of residential, commercial and retail segments in the study area for the alternatives design phase

Appendix B

Government Review Team Comments and Responses Table

FEDERAL AGENCIES & MINISTRIES

Canadian Environmental Assessment Agency		
Comment	**Response**	**Actions Taken**
Regarding Section 2.2, there is no "approval" under CEAA as suggested in the second paragraph of this section. In the document entitled "Advice to Proponents at the Terms of Reference Stage for a Coordinated Federal/Provincial Environmental Assessment Process" (Advice Document) includes suggested wording for inclusion in ToR (Appendix of the Advice Document). This section could be simply replaced with the wording from the Advice Document. The attached flow chart could be in an Appendix to the ToR.	The wording as suggested was included in the ToR. We did not see it necessary to attach the flow chart as an Appendix.	Section 2.2 wording revised to address comment.
CN Rail		
Comment	**Response**	**Actions Taken**
Please remove CN Rail from your GRT list.	CN Rail has been removed from the GRT.	CN Rail has been removed from the GRT.
Environment Canada – Environmental Protection Operations Division – Ontario Region		
Comment	**Response**	**Actions Taken**
No comments or concerns at this time. Look forward to participating in the next phase of the EA.	No response required.	None Required.
Transport Canada – Greater Toronto Airport Authority		
Comment	**Response**	**Actions Taken**
No comments at this time.	No response required.	None Required.

PROVINCIAL AGENCIES & MINISTRIES

Ministry of the Environment – Environmental Assessment and Approvals Branch		
Comment	**Response**	**Actions Taken**
Overall the Draft ToR is well-written and meets most of the ministry's expectations as outlined in the ToR Code of Practice including: • Identification of the proponent; • Indication of how the environmental assessment (EA) will be prepared; • Purpose of the study or undertaking; • Description of and rationale for the undertaking; • Description of and rationale for the alternatives; • Description of the existing environment and potential effects of the undertaking; • Commitments and monitoring; • Consultation plan for the EA; • Flexibility to accommodate new circumstances; and, • Other approvals required.	No response required.	None Required.
As noted by the proponents in the Draft ToR, a detailed summary of the consultation undertaken during the preparation of the Draft ToR, including a summary of the comments received will be provided upon formal submission of the final ToR. It is the ministry's expectation that a summary of all comments received on the Draft ToR, including how those comments have been addressed, where appropriate, will be included in the consultation summary document.	A summary of the comments received on the Draft ToR, and the co-proponent's responses are included in this table which is appended to the final EA ToR.	See Response.
Section 1.1 stated that the ToR "sets out the process to be followed in conducting the individual EA, including a description of how the public, stakeholders and agencies will be consulted." This section should also indicate that Aboriginal communities will be consulted.	Reference to Aboriginal communities was made in Section 1.1 as suggested.	Section 1.1 revised to address comment.

Section 2.1 indicates that other approvals (e.g. Municipal Class EA) may be required. It is advised that should the proponents' require any Class EA approvals that the EA be completed at a level of detail to ensure that all requirements under any Class EA are fulfilled.	The EA study will include all municipal infrastructure within the project area that is required to support the undertaking.	None Required.
It is suggested that in Section 3, when "study" is referenced to as "EA study" to ensure consistency and to ensure that the reader understands what is being referenced.	In some cases, the larger "study" (and not "EA study") is purposely referred to.	Changes have been made in the final EA ToR from "study" to "EA study" where appropriate
In Section 3.4.2 there is a reference to "TRCA". Acronyms should be spelled out first prior to using the shortened term, or a glossary of terms should be provided.	This change was made to the final ToR.	Section 3.4.2 was revised to address the comment.
In Section 3.4. it states: "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". Please provide a reference for this statement (i.e. who expects that there will be a decreased dependence on the private automobile?)	This statement is an opinion of our transportation planning professionals based on their observations of how urban transportation systems in general are changing. This includes more money being invested in urban transit; and more infrastructure, programs and policies that encourage non-auto modes being planned and implemented. Further, there is a growing level of public awareness regarding the impact of single occupant vehicles that is encouraging people to use more sustainable modes of transportation.	None Required.
In Section 6.2, the first sentence in the second paragraph stated that alternative designs "would" be guided by the project goals. The term "would" should be changed to "will" to indicate that this is a commitment that will be followed during development of the EA.	This change was made to the final ToR.	Section 6.2 was revised to address the comment.
Section 7.1 states that only EA approval is required for the road related infrastructure. While this is accurate, it should be noted that everything submitted as part of the overall study will be subject to approval as it will form part of the EA submission.	We will take this into consideration in preparing the EA report.	See response

In Section 7.3, under step 2 the draft ToR states "…data collected will be presented in a clear format…" This statement is not clear, please revise (i.e. what does "presented in a clear format" mean?)	This statement was clarified in the final ToR.	Section 7.3 was revised to address the comment.
Section 7.3 is missing a discussion on how net effects will be determined.	A discussion on how net effects will be determined was included in the final ToR.	Section 7.3 was revised to address the comment.
On page 36, the first paragraph indicated that the need and the means to obtain input on determining relative importance will be determined in the EA. It would help if some examples were provided to give the reader an idea of what may happen during the EA process.	Examples of how input could be obtained to help determine criteria level of importance was included in the final ToR.	Section 7.3 was revised to address the comment.
The second paragraph in Section 9.1 states that a summary of comments "will be" provided in the Consultation Record. This should be rewritten to indicate that a summary of comments "is" included in the Consultation Record.	This wording change was made in the final ToR.	Section 9.1 was revised to address the comment.
It should be noted that the City of Toronto's "First Nations Protocol for EAs", referred to in Section 9.2.2, is misleading and misrepresents the position of the Environmental Assessment and Approvals Branch (EAAB). The protocol was never shared with staff of EAAB and statements within the document do not accurately reflect information that was provided to the City of Toronto. It should also be noted that project specific advice should not be applied to all projects undertaken be the City of Toronto as circumstances for each project may vary.	Reference to the First Nations protocol was removed from the final ToR. The First Nations consultation program outline has been better defined to reflect this specific project.	Section 9.2.2 was revised to address the comment.
In Section 9.2.3 you may want to consider providing some flexibility around the establishment of the Stakeholder Advisory Committee.	Wording changes have been made to provide flexibility.	Section 9.2 was revised to address the comment.
All comments received on the Draft ToR should be considered during preparation of the final ToR. As the proponent, you are responsible for identifying and resolving, where appropriate, any issues raised about the Draft ToR.	This is understood by the project team.	All comments received have been considered in preparing the ToR.
Once you have determined that the ToR is suitable for formal submission to the Minister of the Environment for a decision, you should get in contact with me, at least three weeks in advance, to discuss submission requirements.	Request noted.	Contact was made with the MOE as requested.

Ministry of the Environment – Air, Pesticides and Environmental Planning		
Comment	**Response**	**Actions Taken**
An Air Quality Impacts Assessment must address all applicable Ambient Air Quality Criteria and/or pending Ontario Regulation 419 Schedule 3 Standards for the following contaminants: • CO • NOx (with a focus on NO and NO_2) • TSP • PM_{10} • $PM_{2.5}$ • Selected VOCs (benzene, 1-3 Butadiene, formaldehyde, acetaldehyde and acrolein) The focus of these assessments should be on 24 hour average concentrations however, 1 hour and 8 hour (for CO) should also be considered.	In order to determine air quality impact associated with the proposed Gardiner reconfiguration options, the air quality assessment will address all applicable existing and interim ambient air quality criteria (both provincial and federal) for key conventional contaminants associated with vehicular emissions including NOx, CO, SO2 and Particulate Matter. The assessment will include all applicable averaging periods for the selected contaminants. Regarding the inclusions of VOCs as part of the monitoring/assessment program, the City's Health Department (Toronto Public Health) and the MOE are being consulted with to confirm form and extent of assessment that should be undertaken.	Consultations with the MOE and the City (Toronto Public Health) are being undertaken to confirm the air quality parameters to be assessed as part of the EA Study. Based on consultation with MOE and the City, VOCs will be included in the impact assessment study.
The focus here is on defining a study area which should include the "worst case" whether it is the length of roadway with the highest traffic volumes in close proximity to sensitive receptors or sections of roadways with on and off ramps and overpasses.	The air quality assessment will be a comparative one, which would determine the impacts for various reconfiguration options. When defining the scope of each option, parameters and/or variables that would result in the "worst-case" impact will be incorporated in the assessment.	
All key and potentially sensitive receptors located in the surrounding area must be included in the modelling. This is normally done using a Cartesian grid system so that concentrations at each receptor can be easily modeled.	As a part of modelling the dispersion of vehicular emissions along subject route(s), a receptor grid with relatively fine resolution will be selected within the environmental effects study area. In addition, specific discrete receptor locations within the study area will be identified and included in the assessment.	

Data from the provincial and federal network of air quality sites should be used to provide background contaminant concentrations. It is recommended that background air monitoring be carried out for as long as possible. Six to eight weeks of monitoring will provide limited data and not reflect seasonal variations in contaminant concentrations.	The available ambient contaminant concentration data (from MOE and/or EC) will be used in the assessment, in order to establish background levels. In addition, 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	
The MOE prefers that the proponent evaluate the cumulative effects that the proposed roadway expansion/construction may potentially have on the existing air quality. This can be achieved by adding the modeled results to an estimated "background" concentration for each pollutant. Such background concentrations are obtained from conducting ambient monitoring and/or nearby MOE AQI monitoring stations.	The proposed air quality assessment does include cumulative effects. However, it should be noted that background concentrations obtained from existing monitoring stations or through the ambient air monitoring program for this study include emissions of existing Gardiner traffic. The proposed project is simply a reconfiguration of an existing route and thus to properly capture the impact, the following steps will be completed: (1) model the emissions for the existing Gardiner traffic; (2) establish background levels of relevant contaminants through monitoring / existing data; and, (3) establish "true" background levels (i.e. without contributions from the Gardiner) by subtracting the modelled values from measured background levels.	
The predicted results obtained from the modelling exercise are to be presented in detail in the Air Quality Impact Assessment Report and summarized in the Environmental Assessment document. The presentation and discussion of the potential Air Quality Impacts of the Project is a key component of the analysis.	The Air Quality Assessment will be documented as suggested.	See response.

In order to ensure that Central Region's mandated responsibility are met through the EA process, we recommend that the proponent provide more substantive detail in the evaluation criteria section and the work plan.	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.	See response
The EA Terms of Reference did not provide an adequate work plan regarding the evaluation of the existing natural environment(s). Additional consideration should be taken when assessing the proposed alternatives related to the existing aquatic, terrestrial, and wildlife ecosystems that have re-established in the area. As such, the review or assessment of background information will not be sufficient in determining the preferred alternative. A current inventory of the existing conditions will be required during the review of the proposed alternatives.	There exists a considerable body of background studies available for the environmental effects study area including for example: • Port Lands Estuary Report, 2007 • East Bayfront Class Environmental Assessment Master Plan, City of Toronto, 2006 • Queens Quay Revitalization Environmental Assessment, May 2009 • Toronto Waterfront Aquatic Habitat Restoration Strategy, 2003 • Don Mouth Naturalization and Port Lands Flood Protection Project, 2006 and 2008 Some of this work is quite recent. A comprehensive review of these materials will be undertaken. If it is determined that any component of the natural environment has not been adequately studied, then a field study program will be undertaken to fill these data gaps.	

Ministry of Energy and Infrastructure		
Comment	**Response**	**Actions Taken**
Overall very positive to see key objectives of the *Growth Plan for the Greater Golden Horseshoe* incorporated.	No response required.	
The *Growth Plan*, including context sections, policies, definitions and schedules, should be read in its entirety and all relevant policies are to be applied to each situation.	Reference will be made that the City's Official Plan is consistent with the provincial *Growth Plan*	Section 4.2 was revised to address the comment.
Recommend adding the following bullets in Section 4.0: • The *Growth Plan for the Greater Golden Horseshoe (the Growth Plan)* was released in June 2006. The *Growth Plan* outlines a set of policies for managing growth and development and guiding planning decisions in the GGH to 2031. The *Places to Grow Act (2005)* requires that planning decisions made by the Province, municipalities and other authorities conform to the policies contained in the *Growth Plan*. • The *Growth Plan* aims to: o Revitalize downtowns to become vibrant centres o Create complete communities that offer more options for living, working, shopping and playing; o Provide greater choice in housing types to meet the needs of people at all stages of life; o Curb sprawl and protect farmland and green spaces; and o Reduce traffic gridlock by improving access to a greater range of transportation choices. • The *Growth Plan* identifies twenty-five existing or emerging downtown areas as urban growth centres and establishes policies and minimum density targets to	Reference will be made that the City's Official Plan is consistent with the provincial *Growth Plan*	Section 4.2 was revised to address the comment.

encourage intensification and downtown revitalization. Downtown Toronto is identified as one of these centres. A significant portion of the EA study area falls within the boundary of the Downtown Toronto urban growth centre.		
Ministry of Municipal Affairs and Housing		
Comment	**Response**	**Actions Taken**
No comments at this time but would like to be kept informed of the study progress.	MMHA will be kept informed as the EA progresses.	See Response
Ministry of Health and Long-Term Care		
Comment	**Response**	**Actions Taken**
Although the Environmental Health Branch is interested in the public health aspects of these EA and wish to be kept informed of any further developments, we recommend that you request input from the local Medical Officer of Health for the health unit in which the EA is located.	Response received from the City of Toronto Medical Officer of Health to the MOH letter: *The response from MOHLTC is in line with their traditional approach to such issues. Toronto Public Health (TPH) as a member of the Technical Advisory Committee (TAC) will continue to provide the public health comment required for the undertaking. TPH will keep MOHLTC informed as appropriate. Any documentation submitted for review will be circulated internally within TPH for further review and comment.*	None Required.
Ministry of Culture, Citizenship and Immigration		
Comment	**Response**	**Actions Taken**
No comments or changes to highlight at this time. Please keep us informed on the progress of this project.	MCCI will be kept informed as the EA progresses.	See Response
The Ministry of Culture may be able to provide comments on the impact of the plan on heritage resources (already included in your list).	Comment noted.	None Required.

Ministry of Natural Resources		
Comment	**Response**	**Actions Taken**
It appears that the subject Class EA project will not impact on the policies or programs of this Ministry. Please continue to keep MNR informed through the EA process.	The MNR will be kept informed as the EA progresses.	See Response
Your letter (Notice of Commencement) requested information relating to the natural, human, and economic environments of the project area. Our records show a fishdot (fishfile # 429) for the Don River directly adjacent to the project area. We have no records within the past 20 years of a Species at Risk in the study area.	Comment noted.	None Required.
Since the project is unlikely to affect the waterway, no further involvement by the Ministry of Natural Resources is required. We ask that you contact us if the scope of the project changes or if you discover the presence of a Species at Risk during the EA process.	MNR will be contacted if the project scope changes or a Species at Risk is discovered.	See Response
GO Transit		
Comment	**Response**	**Actions Taken**
Any of the proposed concepts ultimately developed as part of this study that involve the rail corridor, supplementary rail facilities, and/or GO bus routing in any way must be reviewed by GO Transit.	Comment noted.	None Required.
In the “Transit" section - it should be noted that the DVP/Gardiner/Lake Shore combination is the primary route for regional bus carriers (including GO) to and from the east	This was clarified in the final ToR.	Section 5.2.1 was revised to address the comment.
Alternative 4 (illustrating removal of the elevated expressway) shows transit-only lanes in the centre of the right-of-way, with transit represented by streetcars. We suggest that a bus also be included within this context to indicate the potential flexibility of use.	The illustration of Alternative 4, Remove option, is for illustrative purposes only; it does not suggest there will either be transit in the centre of the ROW or that it would be streetcars.	None Required.

OTHER AGENCIES & INSTITUTIONS

Other: Hydro One		
Comment	**Response**	**Actions Taken**
Have no comments on specific content of Draft ToR.	Comment noted.	None Required.
Would like to be more involved as technical design is developed because there are high voltage cables underground near a section of the Gardiner Expressway. (Technical drawings of these lines were sent to Dillon).	The project proponents expect to hold future discussion with Hydro One to fully understand how best to accommodate the existing power cables in the area.	See Response

University of Toronto		
Comment	**Response**	**Actions Taken**
Satisfied with the scope of the framework and required reviews of the study as stated in the brief. This project is important to the City and as indicated in the overview, the options have been many years in the making. Look forward to hearing about the work as it progresses, and would be pleased to attend any future meeting.	The Government Review Team, including the University of Toronto, will continue to be engaged as the EA progresses.	See Response
It is recommended that the terms of reference and scope of the study be reviewed by all funding agencies, i.e., the Federal Government if funding that is expected to be a source of funding. Applications to the Federal Government may trigger another review and cause an unnecessary delay.	The potential funding agencies for the project are not known at this time. Various federal government departments are being consulted as part of the EA study.	None Required.

Colleges of Applied Arts & Technology - George Brown College		
Comment	**Response**	**Actions Taken**
No comments but would like to be kept informed as the project progresses.	George Brown College will be kept informed as the EA progresses.	See Response

Toronto Fire Services Headquarters		
Comment	**Response**	**Actions Taken**
Feel that the mention of including emergency vehicles and services in the study and assessment is sufficient at this time.	No response required	None Required.
No other comments but would like to be kept informed as the project progresses.	Toronto Fire Services will be kept informed as the EA progresses.	See Response
Toronto and Region Conservation Authority (TRCA)		
Comment	**Response**	**Actions Taken**
Page 13 - 3.4.2: The Don Mouth Naturalization and Port Lands Flood Protection Project EA is more than just naturalization. It is also to provide flood protection for up to 230 hectares of land currently at risk to flooding. Any intensification in land use (required to establish sustainable development along the Toronto waterfront within the Port Lands) can only occur after the elimination of flood risk is done.	Comment noted.	None Required.
Page 19 - Bullet 5 - The DMNP EA does not provide flood storage. It is flood conveyance. It is also not just the Don River mouth area being provided flood protection. It is most of the Port Lands north of the Ship Channel and the south Riverdale community out to Ashbridge's Bay currently at risk due to flooding. Much more extensive area than implied in this bullet.	The role of the DMNP was clarified in the ToR.	Section 4.2 – Goal 4 was revised to address the comment.
Page 25 - Second paragraph "These include: Lower Don River West Remedial Flood Protection Project (approved and under construction); East Bayfront...	Change not made as this section is focused on “Plans and Policies” only.	None required
Page 25 - Open space/views - would recommend adding the Flood Protection Landform and the overlying Don River Park as a major new open space and view point currently under construction in the WDL.	This change has been made to the ToR.	Section 5.2.2 was revised to address the comment.
Page 25 - Adjacencies/Edge Conditions: Since under the section of plans, this really should mention that a major	This has been noted in the ToR.	Section 5.2.3 makes reference to the Don River/Don River Mouth

naturalization component is being planned through the DMNP EA process south of Lake Shore and within the Don Narrows.		naturalization initiative to address the comment.
Page 26 - Change last paragraph to "The mouth of the Don River will be naturalized while the risk due to flooding from the Don will be eliminated (up to the Regulatory Flood) as part of the Don Mouth Naturalization and Port Lands Flood Protection Project. The elimination of flood risk will be achieved through a combination of cut and fill to create a new river valley and channel, and through the construction of other engineered flood protection structures."	This change has been made to the ToR.	Section 5.2.3 was revised to address the comment.
Page 29 - Potential Negative Effects - If not properly taken into consideration the potential negative effects of the project may include : "Prevent the elimination of flood risk to the Port Lands and South Riverdale areas, or in a worse case scenario, increase the level of flood risk ", "Impair and/or prohibit the ability to effectively manage for sediment and debris within the Don River"	This change has been made to the ToR.	Section 5.3 was revised to address the comment.
Page 31 - A fifth alternative could be added, a "combination of removal, replacement and/or improvement", depending on a given section of the expressway.	Comment noted. This change has not been made.	None Required.
Page 31 - last bullet add ", flood protection" and naturalization after.... (eg. stormwater quality)	This change has been made to the ToR.	Section 6.1 was revised to address the comment.
Page 37 Table 7.1 - Natural Environment - use correct EA name "Don Mouth Naturalization and Port Lands Flood Protection Project EA" Again, remove flood storage. It is only flood conveyance we are trying to accommodate with the DMNP EA.	This change has been made to the ToR.	Table 7.1 was revised to address the comment.
Page 48 - Appendix A -Stormwater/Municipal Services. Proposed scope of work. Should include comment of Lower Don River West Remedial Flood Protection Project (currently under construction) - particularly as relates to ramps from/to DVP further north of Gardiner.	This change has been made to the ToR.	Appendix A was revised to address the comment

COMMENTS FROM AGENCIES NOT PART OF THE GOVERNMENT REVIEW

City of Toronto - Heritage Preservation Services - City Planning Division

Comment	Response	Actions Taken
Have reviewed the potential area of work in relation to the properties included on the City of Toronto Inventory of Heritage Properties and found that this area includes heritage resources, is adjacent/nearby to heritage resources and may overlap with identified potential Heritage Conservation Districts. They are as follows: Properties on the Inventory of Heritage Properties - **(D)** indicates designation under the Ontario Heritage Act • Gardiner Expressway - Forms part of the Union Station Heritage Conservation District, by-law No. 634-2006. **(D)** • Cherry St Bridge • 309 Cherry St - William McGill & Co and former Bank of Montreal • 400 Commissioner's St - City of Toronto Incinerator • 55 Lake Shore Blvd E - LCBO • 351-369 Lake Shore Blvd E - Victory Soya Mills Silos • 52, 55 and 70 Mill St; 2, 18 and 20 Trinity St; and 39 Parliament - Gooderham and Worts Distillery **(D)** • 16 Munition St - Queen's City Foundry • 95 Queen's Quay - Redpath Sugar • 62 Villiers St - Toronto Harbour Commissioners Storage Building Potential Heritage Conservation Districts • St. Lawrence East • St. Lawrence Area 1 - approved for study by Council	This provided information will be taken into account in the EA in describing baseline conditions in the study area and in the impact assessment of alternatives, if applicable.	See Response

We request that a Heritage Consultant be required to review and assess the potential impact any proposed alterations to the Gardiner Expressway would have on the City's heritage resources. Potential impacts may include, but are not limited to: dismantling or altering the expressway; altering the setting of the heritage properties as part of a new street layout; and preserving vistas of significant heritage properties among other considerations.	A Heritage Consultant is on the project team and the EA work plan includes a Cultural Resource assessment of features that could be affected by the project.	None Required.
Ontario Heritage Trust		
Comment	**Response**	**Actions Taken**
In the context of its provincial trustee role, the Trust is the owner of the provincially significant Enoch Turner School House at 106 Trinity Street, and 265 Front Street East (site of the First Parliament Buildings) a short distance to the west of the subject lands. We wish to draw to the City's attention that the subject lands situated at the mouth of the Don River in a brownfield area contain a potential for industrial / historical archaeological resources.	This provided information will be taken into account in the EA in describing baseline conditions in the study area and in the impact assessment of alternatives, if applicable.	See Response
The Trust strongly recommends that the City ensure that archaeological concerns are addressed in the Terms of Reference for the Environmental Assessment. Give appropriate consideration to this undertaking and its impact upon archaeological potential of that area of the City within the context of the City's Archaeological Master Plan.	The potential for impact on archaeological resources will be assessed as part of the EA study.	See Response

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Gardiner Expressway
and Lake Shore Boulevard Reconfiguration

EA Terms of Reference

WATERFRONToronto TORONTO

DILLON CONSULTING LIMITED . PERKINS+WILL . MORRISON HERSHFIELD

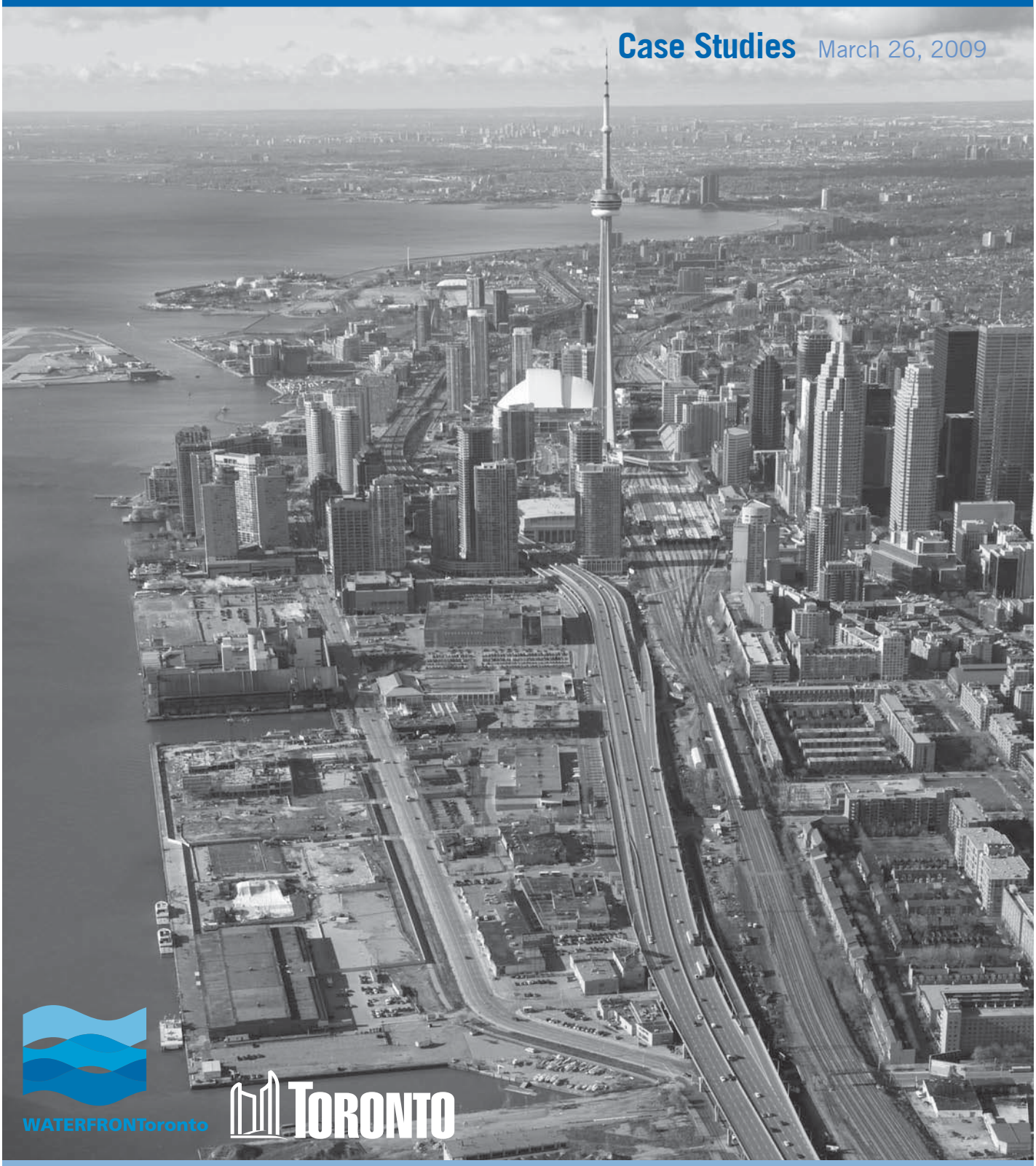
SEPTEMBER 2009

Appendix B
2009 Case Studies Report

Future of the Gardiner Expressway

Environmental Assessment and Urban Design Study

Case Studies March 26, 2009



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TORONTO

Dillon Consulting Perkins+Will HR&A

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Contents

I Introduction

II Scale Comparisions

III Alternatives

IV Compuitive Analysis

V Case Studies

- Alaskan Way Viaduct – Seattle, WA
- West Side Highway – New York, NY
- Bonaventure Expressway – Montreal, QU
- Riverfront Parkway – Chattanooga, TN
- Embarcadero Freeway – San Francisco, CA
- Cheonggyecheon Expressway – Seoul, Korea
- Sheridan Expressway – Bronx, NY
- A8ern8 – Zaanstadt, The Netherlands
- Viaduct des Arts – Paris, France
- East River Esplanade – New York, NY
- Buffalo Skyway – Buffalo, NY
- Whitehurst Freeway – Washington, DC

VI Teasers and Urban Boulevards

VII Summary Matrix

VIII Sources

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Introduction

In March 2009, Waterfront Toronto and the City of Toronto initiated a study entitled "Coordinated Provincial Individual / Environmental Assessment and Integrated Urban Design Study Gardiner Expressway and Lake Shore Boulevard Reconfiguration." A team of consultants, led by Dillon Consultants, will study the future of the Gardiner Expressway and Lake Shore Boulevard in the context of the overall redevelopment of Toronto's waterfront. As a first task in this process, the consultant team prepared the following case study report.

This report is composed of 12 case studies of highway reconfiguration from around the world. The cases describe a range of approaches for both transportation planning and urban design related to highway removal as well as potential costs and benefits of such projects.

A common theme in many is that cities often consider highway removal when infrastructure becomes functionally obsolete. This occurs either at the end of its useful life or after natural disaster.

Another theme is that highway removal decisions are usually made in the context of a significant shift of priorities. City leaders and citizens alike begin to prioritize the goals of sustainable urban development over those of auto-mobility. This latter lesson may have particular resonance for Toronto and the Gardiner Expressway.

The case studies collected here serve multiple purposes:

First, the cases illustrate potential alternative design and development scenarios. The current Gardiner Expressway study will consider multiple alternatives. We looked to see how other cities have approached similar contexts.

Secondly, the cases offer urban design strategies from which we can learn. What are the most innovative ideas for redeveloping land reclaimed by highway removal? How have cities improved conditions around highways they've decided to live with?

Lastly, some of the cases describe how to develop an integrated design approach to highway removal. An integrated approach identifies the full range of issues and opportunities – from urban design to open space, economic development to the environment. The least imaginative projects are those that consider the problem only from the perspective of transportation.

Nearly all of the case studies share a common context with the Gardiner. They separate a downtown from its waterfront. The cases also are, for the most part, from this past decade. While historically significant, the trio of early and already well-documented highway removal projects – Harbor Drive in Portland, OR; the Park East Freeway in Milwaukee, WI; and Boston's "Big Dig" – are not included here.

While the cases tell us what can work in highway removal, at the same time some cases have lessons about what doesn't work and strategies to reconsider.

The case studies were researched using a range of documentation, including design reports, environmental impact statements, newspaper articles, and personal interviews. For each, information was gathered in four categories: urban design, open space, transportation, and economic development. While each case is described in detail, key information and big ideas are summarized in a matrix at the end of the report.

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Scale Comparisons

Scale Comparisons

A8ern8
- Zaanstadt, The Netherlands, 0.4 km (0.25 miles)

Bonaventure Expressway
- Montreal, QC, 1 km (0.6 mile)

Whitehurst Freeway
- Washington, DC, 1.2 km (0.75 miles)

Buffalo Skyway
- Buffalo, NY, 1.6 km (1 mile)

Sheridan Expressway
- Bronx, NY, 2 km (1.25 mile)

Viaduct des Arts
- Paris, France, 2 km (1.25 miles)

Gardiner Expressway
- Toronto, ON, 2.4 km (1.5 miles)

Embarcadero Freeway
- San Francisco, CA, 2.5 km (1.6 mile)

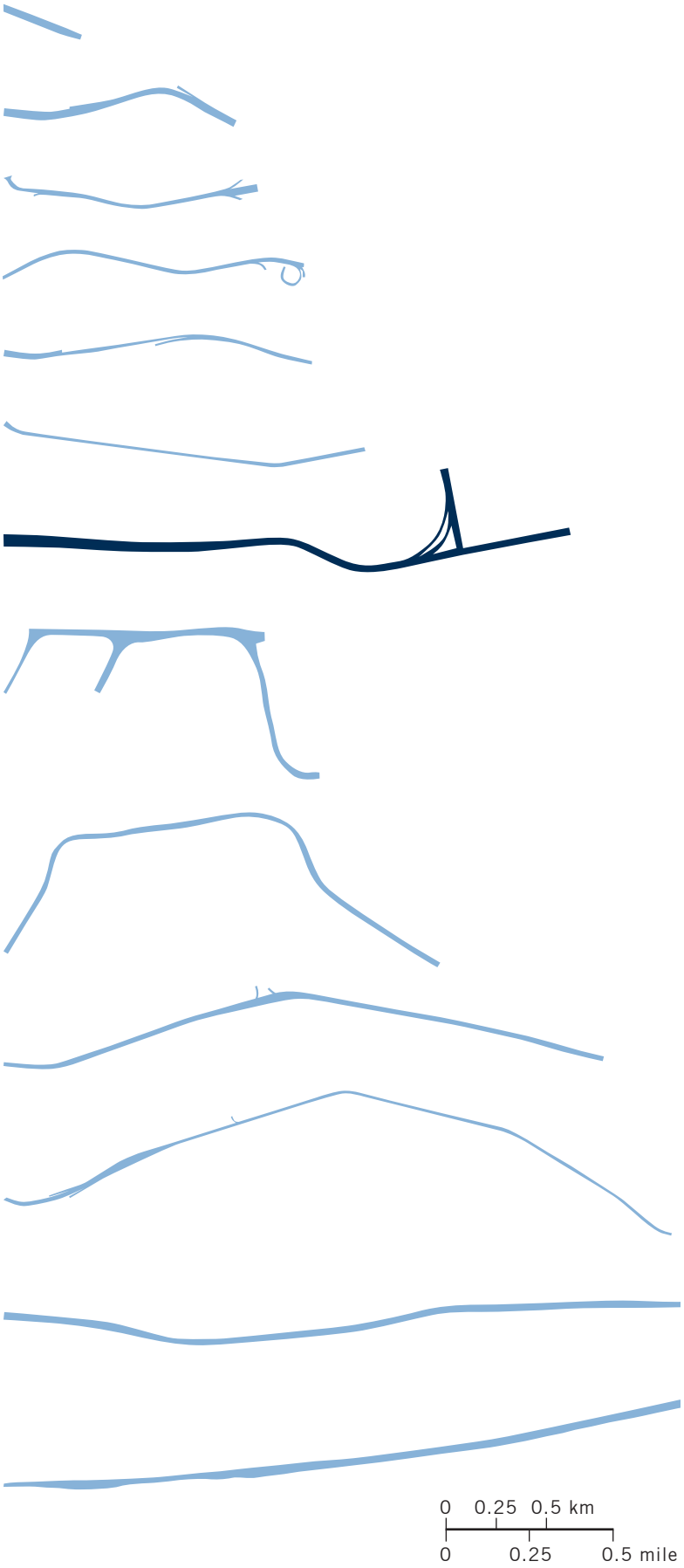
Riverfront Parkway
- Chattanooga, TN, 2.7 km (1.7 mile)

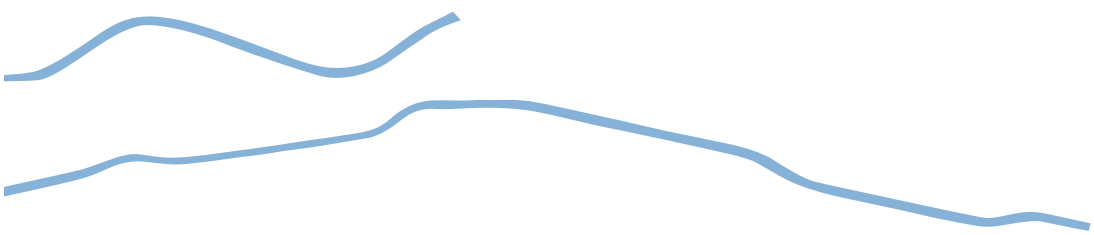
East River Esplanade
- New York, NY, 3.2 km (2 miles)

Alaskan Way Viaduct
- Seattle, WA, 3.2 km (2 miles)

Cheonggyecheon Expressway
- Seoul, Korea, 6.1 km (3.75 miles)

West Side Highway
- New York, NY, 8.2 km (5 miles)





Scale Comparisons

Gardiner Expressway – Toronto, ON

- Year built: 1965; Length: 2.4 km; Vehicles per day: 120,000

Viaduct des Arts – Paris, France – "Ameliorate"

- Year built: 1850s; Length: 2 km; Vehicles per day: N / A

Buffalo Skyway – Buffalo, NY – "Do Nothing"

- Year built: 1966; Length: 1.6 km; Vehicles per day: 43,400

East River Esplanade – New York, NY – "Ameliorate"

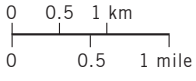
- Year built: 1954; Length: 3.2 km; Vehicles per day: 175,000

Whitehurst Freeway – Washington, D.C. – "Do Nothing"

- Year built: 1949; Length: 1.2 km; Vehicles per day: 45,000

A8ern8 – Zaanstadt, The Netherlands – "Ameliorate"

- Year built: 1970s; Length: 0.4 km; Vehicles per day: N / A

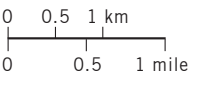


Alaskan Way Viaduct – Seattle, WA – "Replace"

- Year built: 1959; Length: 3.2 km; Vehicles per day: 110,000

West Side Highway – New York, NY – "Remove / Replace"

- Year built: 1937; Length: 8.2 km; Vehicles per day: 140,000



Scale Comparisons

Bonaventure Expressway – Montreal, QU – "Remove"

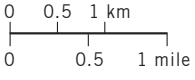
- Year built: 1967; Length: 1 km; Vehicles per day: 55,000

Embarcadero Freeway – San Francisco, CA – "Remove"

- Year built: 1957; Length: 2.5 km; Vehicles per day: 80,000

Sheridan Expressway – Bronx, NY – "Remove"

- Year built: 1962; Length: 2 km; Vehicles per day: 40,000

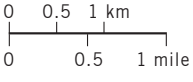


Cheonggyecheon Expressway – Seoul, Korea – "Remove"

- Year built: 1958-76; Length: 6.1 km; Vehicles per day: 120,000

Riverfront Parkway / 21st Century Waterfront – Chattanooga, TN – "Remove"

- Year built: 1960s; Length: 2.7 km; Vehicles per day: 20,000



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Alternatives

Alternatives

The 12 case studies that follow are categorized into four alternatives: Do Nothing, Replace, Ameliorate, and Remove.

An alternative presents a conceptual way to solve a given problem. With respect to the Gardiner Expressway, alternatives propose different approaches for reconfiguring Toronto's street and transit network.

Waterfront Toronto developed four alternatives during earlier Gardiner Expressway and Lake Shore Boulevard studies. The alternatives provide initial points of consideration for the current Gardiner Expressway study. The following describes the alternatives, as defined by Waterfront Toronto:

Do Nothing

- "Maintain the existing road infrastructure in the Gardiner Expressway and Lake Shore Boulevard areas."

The "Do Nothing" alternative represents a continuation of the "status quo" with respect to maintenance costs and traffic volume.

Replace

- "Remove the existing elevated expressway and replace its express function with a different type of grade-separated facility, above- or below-grade."

Ameliorate / Retain

- "Maintain the existing elevated expressway, but modify the ramps and Lake Shore Boulevard to create a better urban environment."

Remove

- "Remove the elevated expressway without replacing the grade-separated express function and replace instead with an at-grade boulevard."

Whereas the four alternatives above represent the current study's starting point, additional alternatives may be considered. Each alternative will integrate proposals for road and infrastructure reconfiguration with public transit and pedestrian solutions, open space and public realm design, and redevelopment opportunities.

Gardiner Expressway in downtown Toronto.

The following describes additional alternatives illustrated by the 12 case studies. These case study alternatives may offer ideas for new unique alternatives or design variations on the four initial alternatives.

Rebuild

- Highway removal studies have been initiated when elevated structures have become unsafe or damaged either by natural disaster or reaching the end of useful life. This was the case, in particular, after earthquakes in San Francisco and Seattle.

  In these instances, alternatives to reconstruct and reestablish an elevated highway's structural integrity were considered. This alternative maintains the "status quo".

Remove Plus

- In some case studies, highway removal offered opportunities to create new large-scale public amenities or reclaimed land for redevelopment. In Seoul, Korea, for example, the Cheonggyecheon Expressway was replaced with a 6-kilometer (3.75 miles) linear park.

Reduce

- A key issue in highway removal studies is whether future scenarios should accommodate traffic volumes (vehicles per daily) at or above existing levels. In some case studies, however, the preferred alternative reduced traffic capacity.

  In Chattanooga, Tennessee, for example, studies showed that an existing parkway had excess capacity. A new boulevard, therefore, was designed to accommodate lower traffic volumes than the demolished highway.

Infill

- Studies to remove waterfront elevated structures have considered the opportunity to modify the waterfront edge through infill.

  An example is the Westway proposal for Manhattan's Hudson River waterfront. It proposed replacing an elevated highway with a tunnel buried underneath infill – thereby adding 178 acres of new waterfront land.

Air-rights

- New construction on elevated highway air-rights has also been considered. Studies for the East River Esplanade, for example, considered building new residential towers over F.D.R. Drive on Lower Manhattan's east side.

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Comparative Analysis

Comparative Analysis

KEY CASE STUDY LESSONS

- Solutions come in different shapes and sizes.
- Transportation solutions should be seen through the lens of city-building and quality of life.
- Transportation uses are continually evolving – changes in demographics, economics, and lifestyle effect traffic demand.
- Traffic demand can be managed.
- Transportation infrastructure offers extraordinary opportunities for design, creativity, and new public realm.
- Infrastructure does not have to be single-purpose or boring.
- The public sector must be strategic in order to capture value of investments in infrastructure to serve both community and development goals.
- 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 and responded to substantively.

The Gardiner Expressway is 2.4 km long (1.5 miles) elevated highway. Its construction was completed in 1966. The six-lane highway (three lanes in both directions) carries 120,000 vehicles per day in the area between Jarvis Street and Leslie Street.

The Gardiner passes through mostly industrial land on the Lake Ontario waterfront. The area includes East Bay Front and Lower Don Lands, two precincts currently being planned by Waterfront Toronto. A railroad embankment forms a barrier between these precincts and three medium-density, mixed-use neighborhoods upland – St. Lawrence, the Distillery District, and West Don Lands.

In terms of scale and urban context, the Gardiner Expressway is most similar, among the case studies, to the Embarcadero Freeway in San Francisco; Bonaventure Expressway in Montreal; Alaskan Way Viaduct in Seattle; and F.D.R. Drive in New York City.

The 12 case studies in this report were analyzed from the combined perspectives of urban design, open space and public realm, transportation, and economic development. Applying these four lenses revealed overall lessons that may resonate for the current Gardiner study. These lessons follow.

It is important to note that whereas about half of the case studies are built, others are still in planning and design stages. In this way, the cases offer both lessons from implementation and inspiration for design ideas.

Solutions come in different shapes and sizes.

The case studies reflect a diversity of approaches – which suggests there is no single strategy for addressing elevated highway issues. Design and development strategies undertaken by cities depend on physical context, transportation needs, public realm goals, and available resources, among other factors.

New York City, for example, had over US $1 billion in federal funds available to create a 8.3 km (5 mile) urban boulevard. The boulevard is abundantly landscaped and includes a bicycle greenway. In contrast, the Amsterdam suburb Zaanstadt took a more modest approach. It choose to live with an elevated highway by improving the space underneath with a grocery and recreation programs. The project cost □2.7 million.

Though these solutions have different scales and costs, both became equally significant public gathering spaces for their respective city.

Transportation solutions should be seen through the lens of city-building and quality of life.

Elevated highway removal decisions are conventionally measured against transportation criteria – level of service, travel time, etc. However, ambitious cities like San Francisco and Montreal have viewed their highways from a different perspective. They have set goals for waterfront access, public realm, transportation, sustainability, and development, then accessed how their highways will have to change to achieve these greater urban goals.

Transportation uses are continually evolving – changes in demographics, economics, and lifestyle effect traffic demand.

The highways of the mid-20th century, particularly in the United States, were designed with specific goals in mind. One key planning agenda was to connect downtowns to suburbs. Planners also sought to link industrial waterfronts to the new interstate highway system.

In some cases studied, city agencies found that these historic goals no longer apply. Moreover, while there is always concern about urban highway congestion, sometimes traffic demand actually decreases over time.

In Chattanooga, for example, Riverfront Parkway no longer served as a though-route for industrial trucking in the Tennessee River

Valley as it did in the 1960s. In fact, the parkway had excess capacity. Redesigning the road as an at-grade boulevard did not therefore produce congestion downtown.

Traffic demand can be managed.

The most successful highway reconfiguration projects complement changes to expressway functions with new transit infrastructure and policy. Traffic demand strategies range from increased public transit to user fees for parking, from incentives for alternatives to commuting by car to congestion pricing.

Seoul, for example, complemented the demolition of the Cheonnggyecheon Expressway – which carried 120,000 vehicles per day – with new bus rapid transit. Seattle will add new light rail when the Alaskan Way Viaduct is replaced with a tunnel. These improvements not only encourage mode shift (from car to public transit, for example), but set the stage for reducing carbon emissions.

Transportation infrastructure offers extraordinary opportunities for design, creativity, and new public realm.

Highway reconfiguration provides rare opportunities for cities to strengthen waterfront connections and create new public realm there. At the same time, some cities have learned that they need not always turn their back to infrastructure.

New York City is developing a new public esplanade under the elevated F.D.R. Drive in Lower Manhattan. Through lighting, program diversity, surface materials, and noise-attenuating cladding, the space under the highway will be transformed into an inviting, active space. Moreover, innovative design will give the East River Esplanade a unique character, making it a one-of-a-kind public space in the city.

Infrastructure does not have to be single-purpose or boring.

Cities are transforming both de-commissioned and active infrastructure into new civic landmarks and unexpected spaces for urban activity. Paris closes the Georges Pompidou Expressway in summer to create an urban beach along the banks of the Seine. Both Paris and New York have re-imagined elevated railroads as linear parks. The design of the High Line in New York integrates landscape with an iconic industrial-era elevated structure.

The public sector must be strategic in order to capture value of investments in infrastructure to serve both community and development goals.

Public investment in highway reconfiguration and removal creates benefits – from development parcels to increased property values to improved quality of life. The public sector must act strategically in order to capture this value. In Montreal, for example, parcels created by removing the Bonaventure Expressway will be sold to the private sector for mixed-use development. Highway removal will also enhance the value of recent redevelopment in the neighboring *Cite Multimedia*.

Conversely, opportunity costs accumulate when decision-making processes drag on. In Seattle, real estate speculators acquired properties along the Alaskan Way Viaduct during a decade of transportation studies. The public sector lost the opportunity to acquire these properties itself, then increase revenue through disposition.

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 and responded to substantively.

City leaders need to support and advocate for integrated approaches to infrastructure design. Their vision must embrace the full range of urban design, public realm, transportation, and economic development opportunities. Visionary leadership is complemented by an informed and engaged public that has an active role in developing design solutions.

The Gardiner Expressway and downtown Toronto viewed from the south-east.

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Case Studies

Replace

Alaskan Way Viaduct, Seattle, WA

Background

The Alaskan Way Viaduct is a 3.2 kilometer (2 mile) four-lane double-stacked elevated highway (two one-way lanes on each level) along Elliot Bay in downtown Seattle.

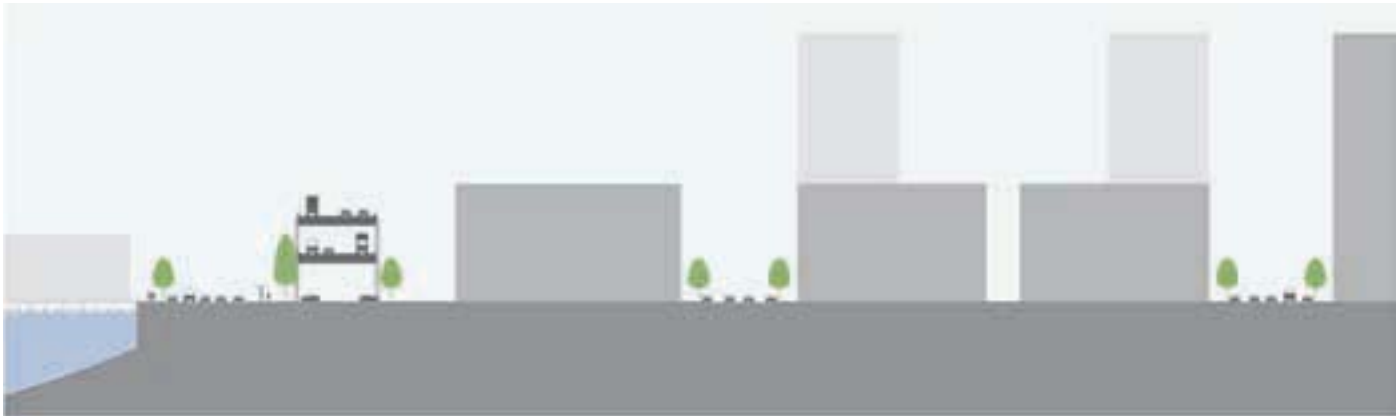
Constructed in 1959, the viaduct approaches downtown Seattle from the south. It creates a physical barrier between Seattle's baseball and football stadiums and its port area. The viaduct mostly serves local traffic, which by-passes downtown on the way from Seattle's north and south neighborhoods. The viaduct also limits access to the Elliot Bay waterfront from downtown.

An earthquake in 2001 damaged the structure's joints and columns. Following the earthquake, the viaduct also settled, raising alarm that Seattle's seawall sustained damage as well. It was determined after the earthquake that removing or replacing the viaduct would be more cost effective than a retrofit.

Because the Washington State Department of Transportation (WSDOT) owns the viaduct and the City of Seattle owns the seawall, removal and replacement studies were jointly initiated. A range of alternatives – from an urban boulevard to a cut-and-cover tunnel similar to portions of Boston's Big Dig – were analyzed.

Parking is a common use under the Viaduct.

The Alaskan Way Viaduct separates downtown Seattle from the waterfront.



Alaskan Way Viaduct Section – Before (Existing)

The Governor announced in early 2009 that the viaduct will be replaced by deep bored tunnel under downtown Seattle. This alternative was not evaluated in the EIS. Cost for the bored tunnel is estimated at US $4.24 billion.

Urban Design

The Alaskan Way Viaduct, in particular because it is a double-decker structure, is thought to reduce the quality of the downtown environment and potential port-area development value. Its visual impact on Steinbreuk Park is especially felt, since this open space is symbolically important to both downtown and the city.

Most land in the downtown waterfront area is privately-owned. While some development parcels will be created, the City of Seattle does not stand to significantly re-capture public investment value through land disposition. Direct economic benefits to the City would come through increased tourism and rising property values.

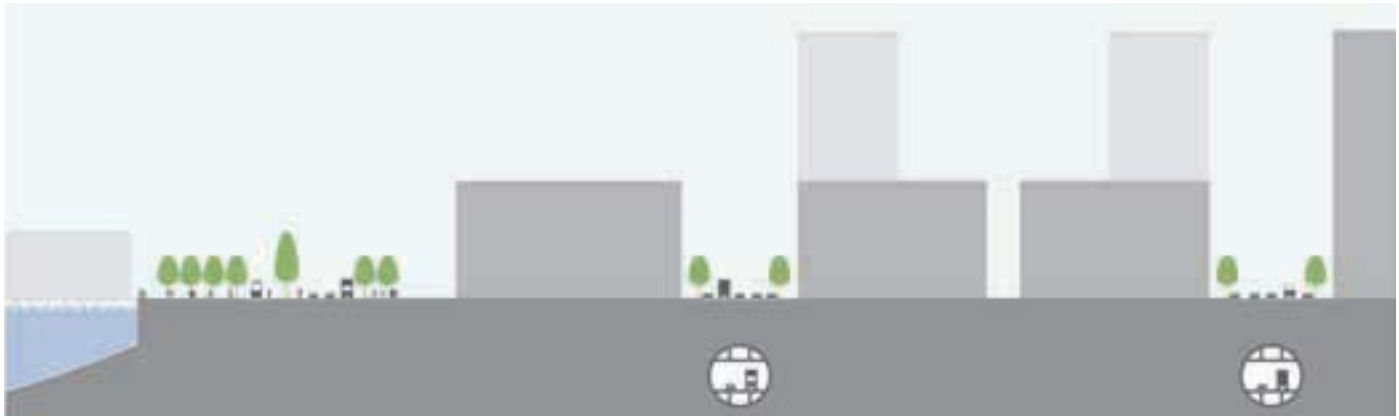
The viaduct also poses a sharp environmental challenge to Seattle – maintaining current traffic volumes on the viaduct will likely exceed state carbon reduction goals, some of the most ambitious in the U.S.

The study's urban design objectives were mostly related to existing waterfront land use plans. Pedestrian and bicycle access were key goals, as well enhanced waterfront and mountain views. All alternatives studied how to create waterfront pedestrian realm and whether bringing the viaduct to grade might, in fact, diminish existing pedestrian realm.

The viaduct is an aging infrastructure. For this reason, safety and design deficiencies – for example, 3-meter-wide (10 feet) lanes – were key concerns. Yet transportation strategies revolved around a key question. Should viaduct redesign accommodate existing traffic volumes – 110,000 vehicles per day – or encourage mode shift?

Existing condition under the Viaduct.

Rendering of proposed condition.



Alaskan Way Viaduct Section – After (Proposed)

All alternatives were designed for multiple modes, including light rail. However, alternatives posed markedly different replacement approaches. On the one hand, investment could be made in a large infrastructure solution. On the other, many smaller street reconfigurations and transit projects might fulfill the City's needs.

Process

Six alternatives were studied: no build; "rebuild" – rebuild a section of the elevated structure and replace the rest with an urban boulevard; "aerial" – rebuild the entire elevated structure; "tunnel" – two alternatives with varying capacity; and "surface" – a new urban boulevard.

These were combined and narrowed to two alternatives: a tunnel with a four-lane at-grade boulevard and an elevated structure with a six-lane at-grade boulevard.

Public dialogue about the Alaskan Way Viaduct focused primarily on congestion. In a 2008 ballot initiative, the public rejected both alternatives. Media suggested voters were influenced by the specter of the Big Dig.

Ultimately, decision-making authority lay with the state. The deep bored tunnel is the most expensive alternative and has limited lane width and access ramps. However, it will allow for minimal disruption during construction (as compared to cut-and-cover technology). The state will assume US $2.81 billion of expenses for the tunnel. The city and port will pay for seawall reconstruction. The project is estimated to create 10,000 jobs over 10 years.

Throughout the eight-year process, the city lost opportunities to capture incremental value the project would potentially create. Real estate speculators began purchasing land within the viaduct corridor that might have come under city-ownership.

LESSONS OF THE ALASKAN WAY VIADUCT

- Choice of technology played a key role in political decision-making. Yet while the deep bored tunnel and urban boulevard will enable significant urban design improvements, it requires massive resource allocation and trade-offs – over US $4 billion.
- Choice of technology also posed transportation trade-offs. Lane widths are constrained and there are limited ramp connections.
- All alternatives considered design implications for integrating multiple transportation modes, including light rail, pedestrian, and bicycle.
- Development and value capture opportunities were lost to the City throughout the prolonged study process.

West Side Highway, New York, NY

Replace / Remove

Background

The West Side Highway extends for 8.2 kilometers (5 miles) from 58th Street to Battery Park along Manhattan's Hudson River waterfront.

Construction of the West Side Highway was completed in 1937. The new elevated highway with an at-grade street below serviced river piers and adjacent manufacturing and distribution districts. A section of the highway collapsed in 1974, closing it to traffic and opening a twenty-year debate on the West Side's future.

The Mayor, Governor, and other city leaders shortly-thereafter advocated for the Westway. This massive project, designed by Venturi Scott Brown, proposed 220 acres of redevelopment, all funded with federal and state transportation grants. A tunnel under 178 acres of landfill would replace the highway. Open space and new housing would be constructed on the fill. Legal battles, however, stalled the project until 1985, when the City diverted the funds to other transportation projects.

US $690 million remained for the West Side Highway's reconstruction. In 1987, the City developed a new plan for an at-grade six-lane boulevard (three lanes in each direction), which was completed in 2001.

Urban Design

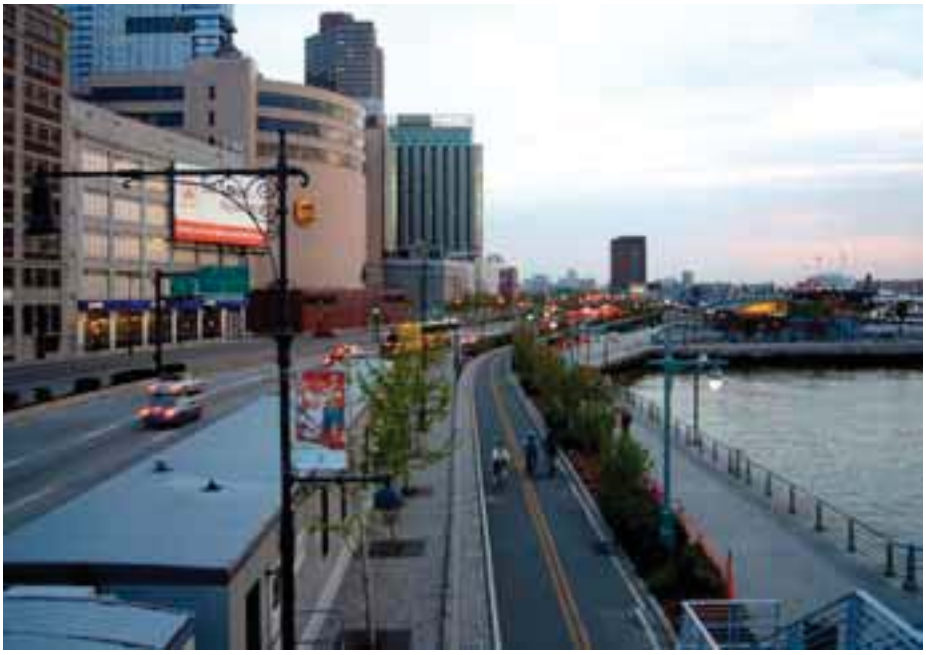
The Westway and final West Side Highway Reconstruction Project reflect two different, era-specific planning approaches. Whereas the Westway is more aligned with large-scale urban renewal, the eventual West Side Highway reconstruction illustrates a more

View of West Side Highway facing north; circa 1940s. Hudson River waterfront shipping and industrial uses are seen on the left.

contextual approach. Even so, the Westway was conceptualized as a more context-sensitive design than 1960s-era highway projects that displaced neighborhoods.

By the time of the collapse, the West Side Highway's role had changed. The industrial Hudson waterfront was in decline as an active city economy sector. The highway's narrow lanes and sharp turns also made the structure technologically obsolete. Following the highway closure, the West Side was largely perceived to be a haven for crime.

The Westway would have created long-term real estate opportunities for the City for land disposition. However, the cost – US $1.7 billion – was generally perceived to be excessive for a new highway. The West Side Highway Reconstruction project created new demand for adaptive reuse and infill along the West Side. Former industrial buildings have been converted to residential, for example. Area property values increased by 20 percent,



View of West Side Highway facing south after completion of restoration project in 2000s.

West Side Highway Section – Before (1930s to 1970s)

totalling US $200 million of added value.

The boulevard proposal EIS questioned whether Manhattan even needed a limited-access arterial. The transportation study analyzed nearly all of Manhattan and concluded that the West Side Highway acted more as a collector-distributor road. Replacing the highway with an at-grade boulevard, therefore, wouldn't be a loss for most drivers. (Whereas the West Side Highway carried 140,000 vehicles per day in the 1970s, today it carries 95,000).

The Department of City Planning authored the new boulevard plan. Design objectives included creating a new multi-modal route and pedestrian waterfront connections as well as streetscape improvements. To this first end, the design incorporates a segment of the Manhattan Greenway bicycle and pedestrian path. The plan also limits auto access and turning locations, and provides a raised median in order to increase pedestrian safety.

Landscape plays a significant role the boulevard's overall visual quality. Barrier curbs and the median are designed to be 0.6- to 0.85-meters-tall. These high curbs offer deep planting beds, allowing for a variety of trees, shrubs, and flowers. The diverse planting palette gives the West Side Highway a parkway character.

The West Side Highway is also integrated, in terms of design, with surrounding planning initiatives. Pedestrian crossing locations, for example, are coordinated with planned entrances to Hudson River Park. Surface materials, paving, and exterior furnishings were also aligned with design standards for Hudson River Park and the Manhattan Greenway.

Process

The Westway was ultimately stalled in court on environmental grounds. The court upheld a lawsuit contending that the project EIS did not properly consider impacts on striped bass. These migratory fish make habitat in the piles of abandoned piers along the Hudson.

The scale and ambition of both the Westway and West Side Highway Reconstruction Project were surely enabled by the funding source. Because most funds were federal, the projects were more politically palatable to local leaders and residents.

The Manhattan Waterfront Greenway parallels the West Side Highway.

LESSONS OF THE WEST SIDE HIGHWAY / WESTWAY

- The West Side Highway Reconstruction Project did not leverage as much development as is likely to occur in Toronto. Instead, it provided amenity access that encouraged substantial economic growth in upland neighborhoods.
- The details of roadbed design provided the opportunity for a richer landscape. The West Side Highway's parkway character makes the boulevard an appealing urban amenity and refers to the City's legacy of constructing parkways.

West Side Highway Section – After (Existing)

Remove

Bonaventure Expressway, Montreal, QC

Background

The Bonaventure Expressway is a 1-kilometer (0.6 miles) elevated highway extending eastward from downtown Montreal to the Lachine Canal.

Constructed in the 1967, the six-lane Bonaventure Expressway parallels the CN Railroad viaduct, which terminates at Bonaventure Place and Central Station downtown. The expressway opened shortly before Expo '67, a large-scale "world's fair" event. Two three-lane one-way at-grade streets – Rue Duke and Rue Nazareth – are located on either side of the elevated structure.

The viaduct and highway separate two neighborhoods. To the south, Griffintown is characterized by nineteenth-century industrial buildings. To the north, the *Cite Multimedia* is a new mixed-use redevelopment area .

The Societe du Havre de Montreal (SHM), a quasi-governmental organization established in 2002, proposed demolition of the Bonaventure in 2005. As part of Montreal's overall waterfront development strategy, Rues Duke and Nazareth would be expanded. Land reclaimed from the Bonaventure would be redeveloped as office, residential, and hotel. The development plan also includes improved area public transit and new waterfront open space.

The Bonaventure Expressway enters downtown Montreal from the east; Peel Basin and Lachine Canal are in the foreground.

Parking is a current use under the Bonaventure Expressway.

Bonaventure Expressway Section – Before (Existing)

The City is currently reviewing the project and approval may come in spring 2009. The project cost is estimated at CA $90 million.

Urban Design

From the perspective of SHM, removing the Bonaventure Expressway posed key development opportunities – creating 4.25 acres of new development parcels and increasing the value of *Cite Multimedia* redevelopment efforts. The Bonaventure had played a role in the area's decline during the 1970s and 80s. In addition, the structure blocked views and diminished pedestrian access to Peel Basin, a potential waterfront amenity.

Urban design objectives integrate transportation, open space, and development planning. The new district would, first of all, provide an entrance to the city and the recently redeveloped *Cite Multimedia* and *Quartier International de Montreal*. Though the plan proposes expanding Rues Duke and

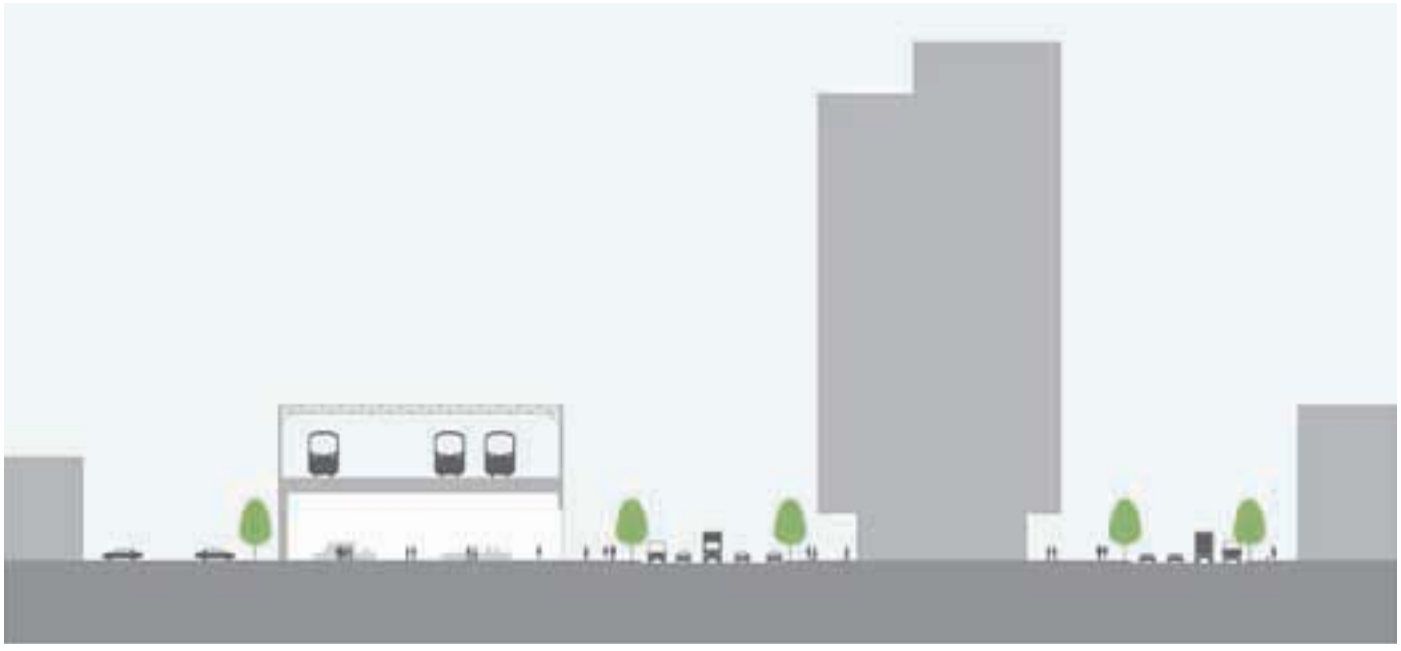
Narazeth from three to four lanes, improved public transit is planned to reduce overall traffic demand. Light rail is proposed to serve as a link within Montreal's waterfront tram system.

Other key objectives are pedestrian and bicycle realm improvements. In particular, the plan includes an underground pedestrian network connecting Montreal Metro stations with new office and residential destinations.

Rendering of proposed condition.

Rendering of proposed condition.

Removal of the Bonaventure Expressway will create parcels for new development.



Bonaventure Expressway Section – After (Proposed)

Montreal already has an extensive network of tunnels – known as *La Ville Souterraine* – which link transit stations and underground retail centers.

The plan also incorporates the railroad viaduct as a development site. Similar to the Viaduct des Arts in Paris, the plan proposes to carve retail spaces into the CN Railroad viaduct's volume.

The project is estimated to encourage $2.7 billion in private investment. Overall, employment created by the project would add more than CA $2 billion to Quebec's gross domestic product. Jobs estimates range from 25,700 to 41,400.

Process

SHM purposed an integrated design approach with *L'autoroute Bonaventure Vision 2025*, specifically prioritizing sustainable development over mobility-based planning. The plan's five key principles emphasize quality of life, economic benefits, public transit, public realm, and an open development process. Accommodating automobile traffic was not the only project-driving priority.

LESSONS OF THE BONAVENTURE EXPRESSWAY

- Rather than evaluating the highway removal project only in terms of transportation planning, the implementing agency set ambitious goals for urban design, public realm, and development, then asked how the highway would have to change to achieve the goals. SHM framed the project as the process of creating a new urban district.
- Removal of the Bonaventure will reduce traffic capacity at the same time that new development will increase demand. The plan proposes a combination of increased public transit capacity, rush-hour demand management, and optimization of the local road network to reduce automobile traffic. These strategies are aligned with Montreal's transportation plan and the Kyoto Protocols.

Rendering of proposed condition looking south on Rue Nazareth. New development is to the left; new retail in the ground-level of the rail road embankment is to the right.

Riverfront Parkway, Chattanooga, TN

Remove

Background

The City of Chattanooga has since 2000 increasing turned its attention to orienting recent downtown investments toward the Tennessee River. Doing so required replacing Riverfront Parkway with an urban boulevard and, subsequently, creating new waterfront open space.

Riverfront Parkway followed the Tennessee River's contour for 2.7 kilometers (1.7 mile) as it curved around downtown Chattanooga's northern edge. The four-lane parkway was constructed in the 1960s in order to speed regional industrial truck traffic through Chattanooga. It separated the medium density downtown from the river. Its median-dividers prevented pedestrians from crossing the road to access the waterfront.

The City constructed and renovated several cultural amenities on both sides of the parkway during the 1980s and 90s. These included the Tennessee Aquarium, a baseball stadium, and a museum of American art. Following these investments, the City sought to reconnect downtown to the river and initiated efforts to remove Riverfront Parkway.

A quasi-governmental organization, RiverCity Company, hired Hargreaves Associates in 2004 to develop the "21st Century

Riverfront Parkway was reconfigured as an at-grade urban boulevard during the 2000s.

Waterfront". The plan creates connections across the new boulevard to 129 acres of new open spaces and mixed-use districts along the Tennessee River.

The 21st Century Waterfront cost US $120 million to construct (which excludes cost of removing Riverfront Parkway).

Urban Design

The parkway project and 21st Century Waterfront were implemented in parallel. Chattanooga's downtown grid was integrated with the boulevard, thereby creating waterfront pedestrian connections and new development parcels. The new waterfront amenities enhanced their value.

By the 1990s, Riverfront Parkway no longer served its initial use. In fact, the parkway had excess capacity. Its redesign was not an issue of accommodating traffic, but rather calibrating its dimensions for current volumes. Lanes were reduced to two, except for downtown, where it has four. Two additional downtown intersections were added to disperse potential congestion.

The 21st Century Waterfront is composed of six open space and development districts on both sides of the river. Because there is little developable land between the parkway and river, most planned development has occurred just upland of the new roadway. The downtown side includes a reconstructed park with terraced public spaces leading to the river edge and amphitheater there. Piers provide boat launches and river views.

Hargreaves' plan is characterized by strong landforms and active shapes. These provide both flood control as well as recreation space.

The Riverfront Parkway streetscape today connects downtown to the Tennessee River.

A sweeping fly-over bridge connects a new downtown public plaza to the arts district, located on a dramatic river bluff. The design therefore gives downtown and the riverfront a contemporary character.

Process

RiverCity Company was established in the 1980s to steward redevelopment along Chattanooga's waterfront. The organization financed the 21st Century Waterfront using no Chattanooga general funds. Fifty percent of the development budget came from a hotel tax, the other fifty from private sources.

The vision for the waterfront was also established by political and agency leadership. Both the Mayor and the city's Planning and Design Studio strongly advocated for an innovative approach for downtown and the river. Whether such vision will continue was questioned in 2005. The mayoral election in that year was won by a candidate who specifically ran on an anti-downtown investment platform.

The City of Chattanooga reports that it leveraged the US $120 million investment in the waterfront for US $2 billion in new public and private development. Before the parkway removal was complete, more than US $100 million in new mixed-use and residential development downtown had already been constructed or planned.

The 21st Century Waterfront offers public access to the river.

LESSONS OF RIVERFRONT PARKWAY / 21ST CENTURY WATERFRONT

- This project illustrates that to implement an innovative design vision, it must be supported and sought after by the highest levels of leadership.
- The roadway design is calibrated for current traffic volumes.
- The City recognized that the role of the highway had shifted – from serving as a through-route for industrial trucking to providing access to cultural and natural amenities.

Pedestrian connections across the River over views of the new watefront park.

Remove

Embarcadero Freeway, San Francisco, CA

Background

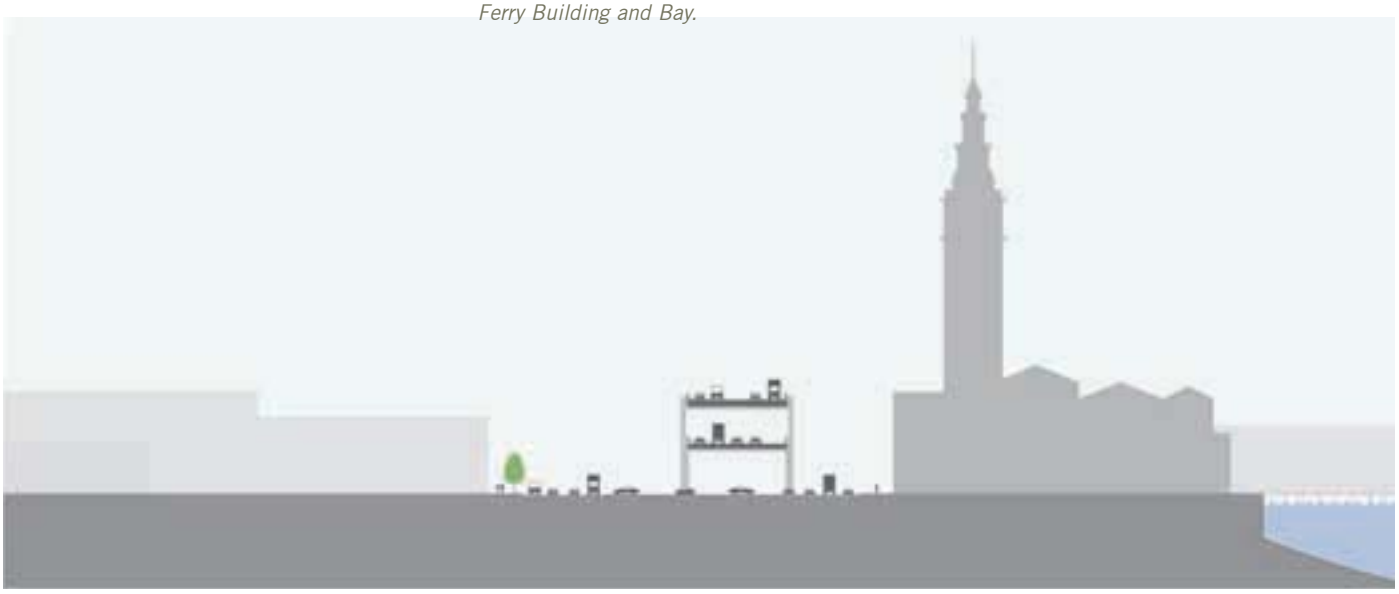
The Embarcadero Freeway was a 2.5 kilometer (1.6 mile) double-deck highway constructed in 1957 in order to provide a connection between the Bay Bridge and Golden Gate Bridge.

The freeway wound through medium density residential neighborhoods, including Chinatown, Rincon Hill, and Transbay, as well as San Francisco's central business district.

Public protest in the 1950s – the "freeway revolt" – led to a reduction in scale of the new highway. Even so, the Embarcadero was a visual and physical barrier between downtown and the bay.

Following damage sustained during the 1989 Loma Prieta earthquake, CALTRANS studied replacement strategies for the Embarcadero. Two years later, the Embarcadero was demolished and replaced with a six-lane

When constructed in the 1950s, the Embarcadero separated downtown from the Ferry Building and Bay.



Embarcadero Freeway Section – Before (1950s to 1980s)

at-grade boulevard. The new boulevard was developed along with a new waterfront promenade, pedestrian- and bicycle-ways, and a streetcar line.

Fifty percent less cars use the boulevard daily than the elevated structure, which carried 80,000 vehicles per day. There was no significant increase in downtown traffic congestion.

Urban Design

The 1989 earthquake and subsequent collapse revived in public imagination the potential for the San Francisco to reestablish its historic relationship to the bay. The Embarcadero was perceived to be an urban eyesore and barrier to waterfront access. In addition, it marred the city's front door, separating the iconic Ferry Building from the foot of Market Street.

Urban boulevard and esplanade construction was guided by clear urban design principles, thereby creating new development opportunities. Design guidelines and a public art program shaped the boulevard's consistent and unique character. Pedestrian-amenable design made the boulevard a generous public gathering space.

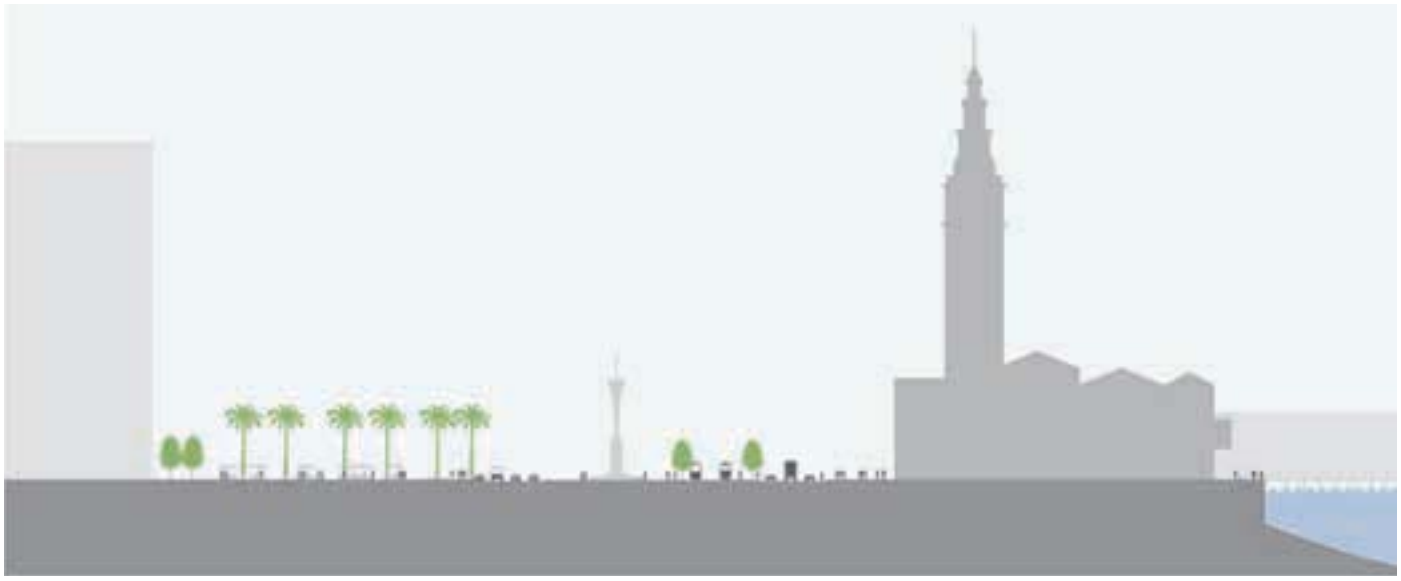
Subsequently, 100 acres of land were reclaimed for new development. The Ferry Building was reopened to the public as a regional food market. Two other waterfront projects – Pier 1 and the Embarcadero Center – attracted new retail and office development.

Housing development also significantly increased. Over 7,000 new housing units were planned for former rights-of-way and ramps in Rincon Hill and Transbay. 2,000 units were developed in the south of Market area. Today, over 83 percent of residents in south of Market arrived after 1990.

The redesign envisioned Embarcadero Boulevard as a multi-modal street integrated with the surrounding urban grid. Transit

View of the Ferry Building from the south-east.

Removing the Embarcadero reclaimed over one mile of waterfront.



Embarcadero Freeway Section – After (Existing)

improvements in the Embarcadero corridor, however, built upon existing efforts. San Francisco had implemented "transit first" policies since 1972. The city Board had passed highway demolition resolutions three times in the 1970s and 80s. In 1986, the issue was brought to public referendum, which was voted down.

Concern over congestion increases downtown did not materialize despite an immediate 25 percent capacity reduction. Forty-two percent of drivers found alternate routes within six weeks of the earthquake. Other drivers reduced discretionary trips or opted for public transit.

Process

CALTRANS studied three alternatives for the damaged Embarcadero Freeway: seismological retrofit; a tunnel; and an at-grade urban boulevard.

The third alternative was selected primarily based on cost. This alternative attracted significant public support, in particular from anti-growth advocates. Almost immediately after the earthquake, San Francisco's Mayor announced his support for demolishing the Embarcadero.

Yet there was also opposition. Chinatown merchants argued removing the highway would decrease their customer base, which was increasingly shopping in suburban locations.

LESSONS OF EMBARCADERO FREEWAY

- The Embarcadero Freeway removal signaled a shift in priorities among municipal officials from mobility-based planning to sustainable urban development.
- Urban design has a key role to play in highway removal – boulevard design slowed traffic, thereby creating an environment amenable to retail and residential development. In addition, land use planning was intergrated with traffic engineering.
- Values of property adjacent to the new Embarcadero Boulevard increased by 300 percent; jobs in the area increased by 23 percent.

The Ferry Building has becoming a gathering space for the city. Over 25,000 people visit it each weekend.

Cheonggyecheon Expressway, Seoul, Korea

Remove

Background

The Cheonggyecheon Restoration Project transformed a 6.1-kilometer (3.75 miles) elevated expressway corridor in downtown Seoul into a linear park and reclaimed stream.

Between 1958 and 1976, the Cheonggyecheon stream was incrementally covered by a ten-lane at-grade street. A four-lane elevated highway was constructed above. The Cheonggye district, composed of office buildings and retail markets, became among Seoul's most congested areas.

A new mayor initiated a plan in 2002 to demolish the highway from the central business district eastward, day-light the buried stream, and create an open space amenity for the city. Highway removal would be complemented by new bus rapid transit. In just 27 months, the highway had been replaced by pedestrian esplanades and gardens. Two-lane boulevards were located at-grade on either side of the open space, which, along with the stream, is two meters (6.5 feet) below-grade.

The project cost was publicly reported as US $390 million, though the budget may have been as much as US $900 million.

The Cheonggyecheon Expressway contributed to declining property values and population loss in Seoul's downtown before it was replaced by a linear park.

A esplanade offers public access to the day-lighted creek.

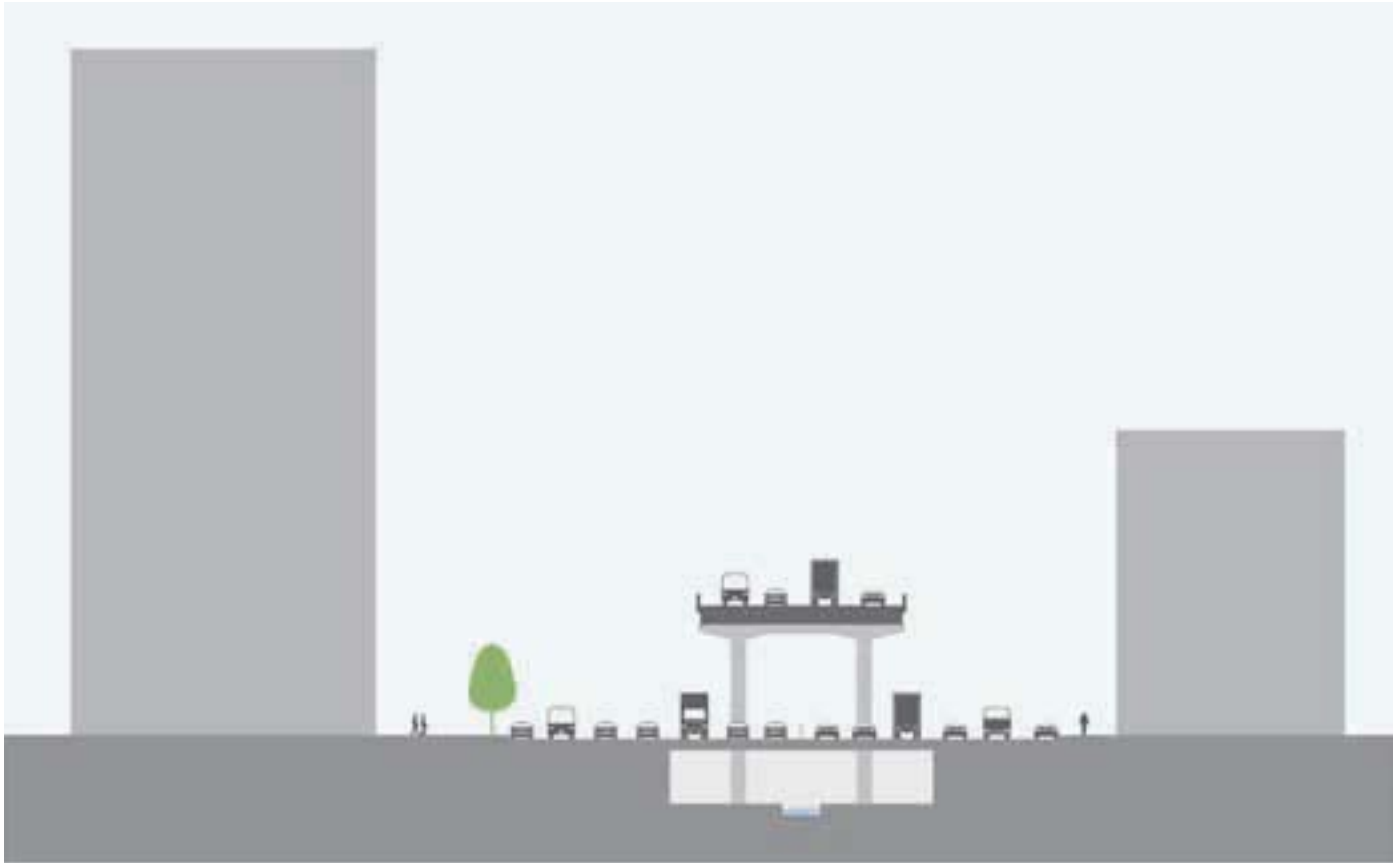
Urban Design

The Cheonggyecheon Restoration Project signaled a shift in municipal officials' priorities towards quality of life issues. Moreover, the new Mayor committed to remaking Seoul as a sustainable city. Not only did the Cheonggye area suffer from congestion, but also population and property value decline. The new open space would benefit the 200,000 area merchants as well as Seoul residents as a whole.

Pedestrian access to the below-grade public space is provided at 5-minute-walk intervals by terraced steps. New pedestrian bridges connect either side of Cheonggyecheon. A variety of landscape types and water features characterize different park segments. In the year following its opening, the park attracted 90,000 visitors daily. Thirty percent of visitors came from outside Seoul's metropolitan area.

The elevated structure removal occurred at the same time as significant upgrades to Seoul's public transportation system. A bus rapid transit route was introduced to absorb riders from at least 120,000 cars formerly on the expressway. Bus rapid transit was also increased on feeder routes. In the previous decade, the City created incentive programs to encourage commuters to use transit and raised user fees for parking downtown.

Combined, these transportation strategies resulted in a nine percent decrease in traffic into the central business district.



Cheonggyecheon Highway Section – Before (1950s to 2000s)

Sustainability objectives guided the project as well. The City recycled ninety-six percent of demolition debris for street paving material. Removal of the expressway appears to have lowered summer temperatures in the project area by seven degrees.

The seasonal Cheonggyecheon stream, however, is not truly restored. Water is diverted from the nearby Han River to assure continuous water flow in the 1-meter-deep (3 feet) streambed.

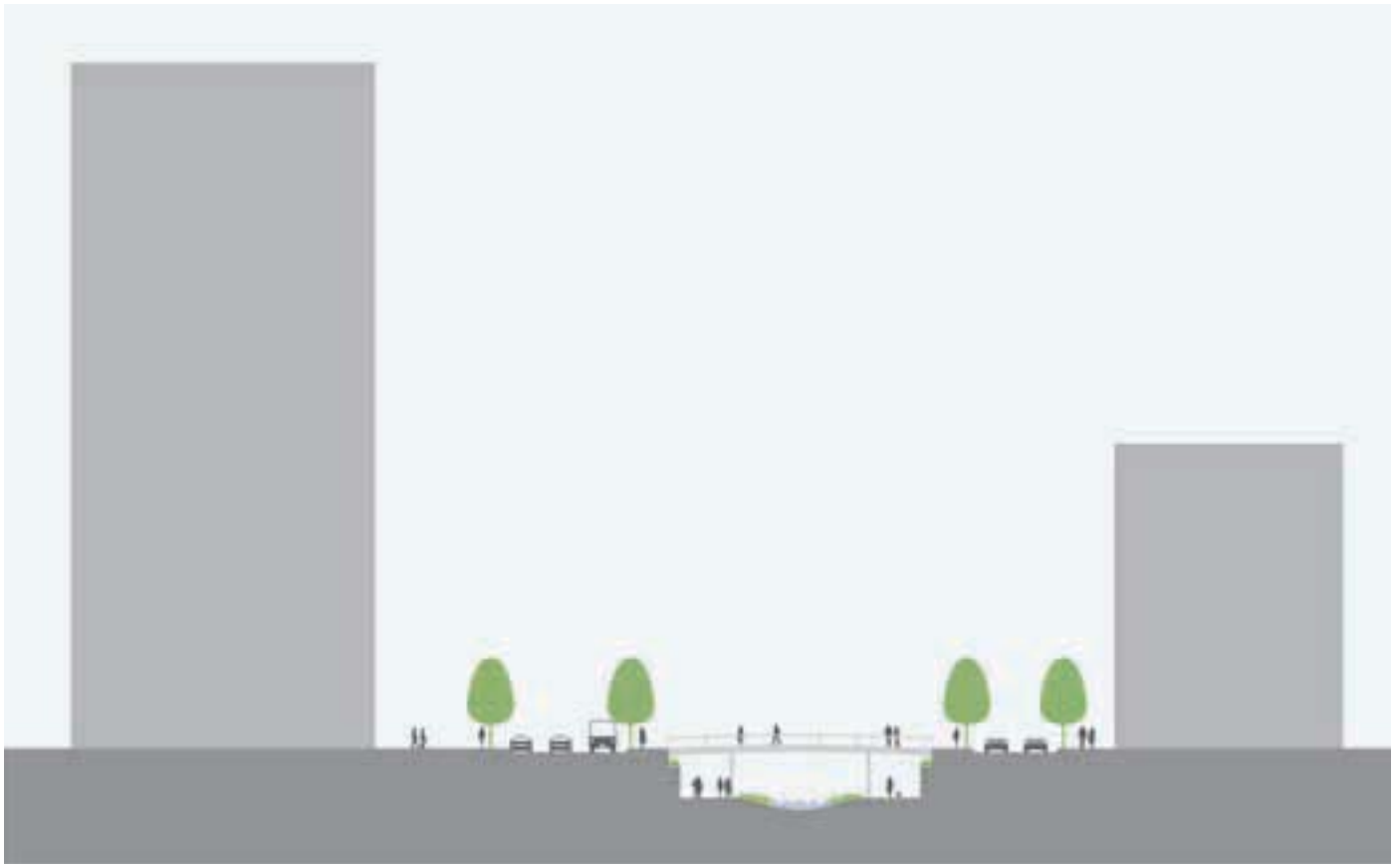
Process

Much impetus behind the project was political. The Mayor had campaigned on quality of life issues, including the proposal to demolish the Cheonggyecheon Expressway. Having made good on his promise, he campaigned for and won the Korean presidency.

Values of property adjacent to the Cheonggyecheon project are estimated to have increased by 30 percent. Between US $8.5 and $25 billion of long-term economic benefits are estimated as a result of the project.

LESSONS OF CHEONGGYECHEON RESTORATION PROJECT

- Highway removal was coordinated with system-wide transportation strategies. New bus rapid transit, a form of congestion pricing, and parking user fees together helped to reduce traffic downtown after the Cheonggyecheon Expressway was demolished.
- The Cheonggyecheon Restoration Project illustrates how the desire to remake the city's image can drive large-scale infrastructure improvements.
- Implementation occurred in an incredibly short timeframe. Yet the project followed a top-down, urban renewal planning model – thousands of street merchants, for example, were relocated out of the district. This planning approach is less feasible in North America.



Cheonggyecheon Highway Section – After (Existing)

Remove

Sheridan Expressway, Bronx, NY

Background

The Sheridan Expressway is a 2 kilometer (1.25 mile) highway along the Bronx River in the Bronx. It connects the Bruckner Expressway to the Cross Bronx Expressway.

The Sheridan was constructed in the 1960s as a minor link in the Bronx highway system. The Bronx has historically shared the heaviest proportion of New York City's trucking traffic. The Sheridan separates a high density residential neighborhood of five- to six-story apartment buildings from the Bronx River. Immediately to the south is Hunts Point Market, the world's largest wholesale food distribution center.

The New York State Department of Transportation (NYSDOT) undertook studies in the late-1990s to improve access to Hunts Point. Fulton Fish Market had just relocated from Lower Manhattan to Hunts Point. At the same time, a coalition of non-profit organizations – including South Bronx Watershed Alliance and Sustainable South Bronx – developed in 1999 a community plan. It proposed an at-grade boulevard to replace the Sheridan, reclaiming 28 acres for open space and housing.

Though NYSDOT incorporated the community plan into its alternative plan, the agency's recommendation in 2007 was to retain the Sheridan Expressway. Subsequently, NYSDOT announced in 2008 that because the earlier recommendation was determined to be infeasible, the agency will continue to study two options – highway removal and retention – and will issue a new report in 2010.

Urban Design

The community plan argues the Sheridan Expressway has excess capacity. Replacing it with an at-grade boulevard would therefore remove a waterfront barrier without increasing congestion or travel times. The Sheridan Expressway is also bound to historic environmental justice issues in the South Bronx.

Since the Bronx shares the largest volume

Cyclists on Sheridan Expressway during bicycle event.

of truck traffic, its neighborhoods have high incidences of asthma and other air-quality-related health issues. Construction of the highway in the early-1960s was followed by two decades of neighborhood disinvestment.

NYSDOT focused its study on access to Hunts Point Market. It did not consider urban design issues.

The community plan aligned highway removal with neighborhood and open space planning goals. The plan includes 1,200 affordable housing units, 120,000 SF of retail, community, and manufacturing space, and a 10-acre park. The new waterfront open space would provide a key link in the overall plan for the 37-kilometer (23 miles) Bronx River watershed – which has gained two new open spaces in the last five years. In addition, highway removal would reclaim land for housing development.

The Community plan estimates new development would create 700 new jobs. Similar waterfront park projects in New York City, such as Hudson River Park, have stimulated reinvestment in upland neighborhoods.

Process

Three families of alternatives were considered: remove the Sheridan Expressway and replace in an at-grade boulevard; reconstruct expressway ramps to improve Hunts Point access; and reconstruct the ramps and provide additional access from Port Morris to the south. Overall, 21 alternatives were evaluated within the three families. NYSDOT recommended two alternatives from family two.

A multi-step process evaluated the alternatives against 14 objectives. First, through a public process, the alternatives were scored against the objectives. Second, quantitative measures were assigned to each objective and the alternatives were scored again. In both instances, the scores were weighted based on public input.

NYSDOT's ramp improvement alternatives outscored the highway removal alternatives. In fact, because public input preferred reducing truck traffic on local streets as well as truck emissions, the highway removal alternatives quantitatively scored poorly.

LESSONS OF THE SHERIDAN EXPRESSWAY

- The evaluation methodology was overly complicated. By focusing on transportation objectives, the evaluation obscured neighborhood open space and development goals.
- The community plan reclaims land for development and increases neighborhood value through new waterfront connections.

The Bronx River Watershed Alliance proposes to create a 10-acre park and 1,200 housing units by removing the Sheridan Expressway.