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

March 4, 2014 Public Works and Infrastructure
What are we studying?

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

- Decision on future of Gardiner East is needed
- Gardiner East is more than 50 years old
- Requires significant public investment, regardless of option
- Interim repairs 2013 to 2014
- Full reconstruction of Gardiner East deferred to 2020, pending completion of EA
Downtown vs. Through Trips
(AM Peak Hour Westbound)

- Spadina/Yonge-Bay-York: 2,600 (35%)
- Jarvis/Sherbourne: 500 (7%)
- Richmond: 1,800 (24%)
- Lake Shore: 700 (9%)
- Dufferin/427: 1,550 (21%)
- DVP: 4,500 Per Hour
- Gardiner East Study Area
- Lake Shore: 2,900 Per Hour
Downtown vs. Through Trips
(AM Peak Hour Eastbound)

- Spadina/York-Bay-Yonge: 3,000 (54%)
- Jarvis/Sherbourne: 1,400 (25%)
- DVP: 900 (16%)
- Lake Shore: 350 (6%)

Eastbound @ Dufferin
5,650
Per Hour

Gardiner East
Study Area
Getting Downtown
(AM Peak Hour 2011)

157,200 Total

- Walk/ Cycle: (5,200)
- Auto (All Other Routes): (33,500)
- Auto (Gardiner Eastbound @ Bathurst): (5,900)
- Auto (Gardiner Westbound @ DVP): (6,100)
- GO Transit: (5,200)
- TTC Transit: (28,800)

Note: Auto includes all vehicles (taxis, trucks, buses, cars, etc.)
Evaluation
Evaluation Approach

- 4 Study Lenses
  - 16 Criteria Groups (60 Measures)
- Comparison of relative advantages & disadvantages for each criteria group
Four Alternatives
Maintain $291M NPV

- Funding fully committed for first 10 years
- Maintain 6-lane Gardiner and rehabilitate deck
- Maintain auto capacity
- Limited public realm improvements & land creation opportunities
- Numerous turn restrictions on Lake Shore
- 6 years of construction impacts on travel lanes
• Maintain but reduce 6-lane Gardiner and Lake Shore to 4-lanes each
• Modified rehab program with reduced lanes / standard shoulders
• Public realm improvements on Lake Shore & new cycling trail
• Reduction of turning restrictions and conflicts among users
• Modest land development opportunities of $2M NPV
• 6 years of construction impact on travel lanes
Replace $692M NPV

- New elevated structure built to today’s highway standards
- Public realm improvements on Lake Shore & new cycling trail
- $65-70M NPV revenue from land development opportunities
- 8 years of construction impact on travel lanes with full closure of the corridor for some periods
• Remove 6-lane Gardiner Expressway East
• Create expanded 8-lane, at-grade Lake Shore Blvd: landscaped, dedicated turning lanes, 2-sided street, sidewalks and cycling trails
• $80-90M NPV revenue from land development opportunities
• 3 years of construction impact on travel lanes
Preliminary Evaluation Results

<table>
<thead>
<tr>
<th>Study Lens/ Criteria Group Summary</th>
<th>MAINTAIN</th>
<th>IMPROVE</th>
<th>REPLACE</th>
<th>REMOVE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRANSPORTATION &amp; INFRASTRUCTURE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automobiles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedestrians</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cycling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Movement of Goods</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constructability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>URBAN DESIGN</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Realm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Built Form</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ENVIRONMENT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social &amp; Health</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ECONOMICS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional Economics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Economics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Cost and Benefit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Transportation & Infrastructure
Auto and transit modelling based on a 2031 scenario, including estimated growth:
- Full build out of the waterfront including the Port Lands over the next 40-50 years
- GTHA population growth of 31%; City growth of 17.6%
- GTHA employment growth of 39%; City growth of 44%
- Increase of inbound trips to central area of 50%; majority through transit
- Mode split among cars, transit, cycling and walking based on trends since 1985

Planned transit lines included in the transportation model include:
- Relief Line
- East Bayfront LRT/ Broadview Streetcar Extension
- GO Service improvements
- Union Station Improvement Plan

Modeling results show that transit needed to meet projected travel demands under any alternative (Maintain, Improve, Replace, Remove) to manage congestion, facilitate growth and support new jobs.
## Auto Travel Times

### Actual & Projected Inbound Travel Times
#### AM Peak Hour Average

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2012</th>
<th>2031 Maintain</th>
<th>2031 Improve</th>
<th>2031 Replace</th>
<th>2031 Remove</th>
</tr>
</thead>
<tbody>
<tr>
<td>A to D</td>
<td>40 min</td>
<td>45 min</td>
<td>50 min</td>
<td>55 min</td>
<td>55 min</td>
<td>60 min</td>
</tr>
<tr>
<td>B to D</td>
<td>20 min</td>
<td>25 min</td>
<td>30 min</td>
<td>35 min</td>
<td>35 min</td>
<td>40 min</td>
</tr>
<tr>
<td>C to D</td>
<td>20 min</td>
<td>20 min</td>
<td>25 min</td>
<td>25 min</td>
<td>30 min</td>
<td>30 min</td>
</tr>
<tr>
<td>E to D</td>
<td>25 min</td>
<td>25 min</td>
<td>25 min</td>
<td>30 min</td>
<td>30 min</td>
<td>30 min</td>
</tr>
</tbody>
</table>

---

*Maps showing travel times between Victoria Park/Finch, Don Mills/Eglinton, Victoria Park/Kingston, Union Station, and Kipling/Lake Shore.*
Maintain – *6 years travel lane impact*
- Close 2 Gardiner travel lanes
- Demolish and rebuild deck in segments
- Closure of Lake Shore travel lanes at times

Improve – *6 years travel lane impact*
- Close 2 Gardiner travel lanes
- Demolish and rebuild deck in segments
- Closure of Lake Shore travel lanes at times

Replace – *8 years travel lane impact*
- Close Gardiner/ Lake Shore corridor for majority of construction
- Construct new structure

Remove – *3 years travel lane impact*
- Pre-build on/off ramps and re-align Lake Shore (Cherry and DVP)
- Close 3 Gardiner travel lanes in two stages and demolish
- Complete Lake Shore between Jarvis and Cherry
Urban Design
Compatibility with Neighbourhood Plans

Maintain & Improve
View Looking North Don River & Keating Channel (Don Mouth Naturalization)

Remove
View Looking North Don River & Keating Channel (Don Mouth Naturalization)
Environment
### Environment

#### Social & Health

<table>
<thead>
<tr>
<th></th>
<th>Maintain</th>
<th>Improve</th>
<th>Replace</th>
<th>Remove</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Noise Level</strong></td>
<td>69-78</td>
<td>68-78</td>
<td>67-77</td>
<td>61-70</td>
</tr>
<tr>
<td><strong>(Decibels dBA)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Local Air Quality</strong></td>
<td>336</td>
<td>335</td>
<td>313</td>
<td>300</td>
</tr>
<tr>
<td><strong>(NOx emissions t/yr)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Local AQ</strong></td>
<td>32.5</td>
<td>30</td>
<td>29</td>
<td>27.4</td>
</tr>
<tr>
<td><strong>(PM2.5 emissions t/yr)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Regional Air Quality Burden</strong></td>
<td>0.25%</td>
<td>0.25%</td>
<td>0.25%</td>
<td>0.24%</td>
</tr>
<tr>
<td><strong>Regional Greenhouse Gas</strong></td>
<td>0.28% to 0.29%</td>
<td></td>
<td></td>
<td>0.24%</td>
</tr>
<tr>
<td><strong>(GHGs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Remove health benefits are due to reduced traffic volumes.
Economics
## Revenues from Public Sales

<table>
<thead>
<tr>
<th></th>
<th>Maintain</th>
<th>Improve</th>
<th>Replace</th>
<th>Remove</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New Development Parcels (Acres)</strong></td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td><strong>New Development Area (Gross Square Feet)</strong></td>
<td>0</td>
<td>0</td>
<td>1,900,000</td>
<td>2,800,000</td>
</tr>
<tr>
<td><strong>New Revenue from Public Land Sales (NPV)</strong></td>
<td>0</td>
<td>$2M</td>
<td>$65-70M</td>
<td>$80-90M</td>
</tr>
<tr>
<td><strong>New Revenue from Public Land Sales (2013$)</strong></td>
<td>0</td>
<td>$3M</td>
<td>$150-160M</td>
<td>$220-$240M</td>
</tr>
</tbody>
</table>

**Note:** Does not include private land value increases of 3% under Replace and 4% under Remove

**Source:** HR&A Gardiner Expressway Economic Evaluation of Proposed Alternatives, Dec. 12, 2013
Cost (100 Year Lifecycle)

Economics

Maintain: $291
- Capital: $84
- Add. Capital: $81
- Life Cycle: $126

Improve: $354
- Capital: $285
- Add. Capital: $69

Replace: $692
- Capital: $48

Remove: $240
- Capital: $19
- Add. Capital: $221

Available Capital Funding $126 million NPV

Preliminary Order of Magnitude Cost ($NPV Millions)
Preliminary Order of Magnitude Costs
Excluding Life cycle costs - $ Millions - Inflated

- **Maintain**: $394
  - Add. Capital: $164
  - Capital: $230

- **Improve**: $506
  - Add. Capital: $276
  - Capital: $230

- **Replace**: $1,255
  - Add. Capital: $417
  - Capital: $230

Available Capital funding $230 million - inflated
• Base budget for four EA options = approved City budget allocation of about $126M NPV to rehabilitate Gardiner East (Jarvis to DVP)

• All four options reflect costs higher than the current budget for rehabilitating the easterly section of the Gardiner

• Under Maintain, the bulk of costs above the current approved 10-year budget for Gardiner East are for future needs as follows:
  – Future rehabilitation works in E/W transitional areas between Yonge and Jarvis, and at DVP and Logan ramps
  – Costs for realignment of Lake Shore Boulevard and replacement of Don River Bridge as per Council-approved Keating Channel and Lower Don Lands Plans
Funding Strategy

- Magnitude of variances from base budget assessed in report

- Initial capital cost differential between Remove and Maintain base budget is $23M

- However, Remove provides lifecycle cost savings in the order of $51M NPV over next century

- Report recommends detailed financing strategy for 2015 report back

- Non-debt funding sources to be examined include:
  - Building Canada Funding
  - P3 Procurement Process
  - Eligible DC funding
  - Proceeds from future land sales
  - Lifecycle cost savings
Conclusion

• Remove identified as the preferred EA option
• Provides longterm cost savings to City – $51M NPV
• Creates a great street that anchors new waterfront neighbourhoods
• Enhances public realm
• Opens up Keating Channel and Don Mouth
• Adds value to lands in the corridor
• Reduces air and noise pollution
Next Steps
Next Step: Alternative Designs Stage

• Develop design options for preferred alternative:
  – Right-of-Way, road, ramp, intersection design including public realm & transportation design
  – Construction staging and mitigation, including accelerated construction to reduce impact on drivers
  – Mitigation and impact management
  – Optimize traffic flow by using Intelligent Transportation Systems (ITS) such as signal synchronization for peak and non-peak service

• Detailed financing strategy
• Report back in 2015, prior to submission of EA to Ministry of Environment
Next Steps

- Approved EA Terms of Reference
- Public and Design Ideas, Alternative Solutions
- Committee & Council Consideration
- Develop and Assess Alternative Designs
- City Council & Submission to MOE
- MOE Review & Decision
- Detailed Design
- Tender Award & Pre-Construction
- Demolition & Construction

2009

Public Meetings:
June 13/13, Oct 16/13, Feb 6/14

**PWI Committee March 2014**

- Spring – Fall 2014
- Winter 2015
- Late 2015/early 2016 onwards

- One Year
- One Year
- Six Years