Transportation 2040

Implementation Report #1     |     2013-04-24
False Creek Bridges
ECONOMY
supports a thriving economy while increasing affordability

PEOPLE
Healthy citizens in a safe, accessible, and vibrant city

ENVIRONMENT
City that enhances its natural environment for its people and the planet
Council Requested Report Back Topics

- Progress on Planning for Broadway Subway
- False Creek Bridges
- Local Transit Improvements
- Walking and Cycling Safety
- Public Spaces
- Closed Crosswalks
- Open Data

*as of October 31, 2012*
## Transportation 2040 Implementation

<table>
<thead>
<tr>
<th>Enablers/ Monitoring</th>
<th>Open Data</th>
<th>Annual Traffic Counts</th>
<th>Transportation Panel Travel Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rapid Transit on Broadway</strong></td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="People" /></td>
<td><img src="image" alt="Tree" /></td>
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<tr>
<td><strong>False Creek Bridges Infrastructure Rehab and People Movement</strong></td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="People" /></td>
<td><img src="image" alt="Tree" /></td>
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<td><strong>Local Transit Improvements</strong></td>
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<td><img src="image" alt="Tree" /></td>
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<td><strong>Walking and Cycling Safety</strong></td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="People" /></td>
<td><img src="image" alt="Tree" /></td>
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<tr>
<td><strong>Public Plazas</strong></td>
<td><img src="image" alt="Graph" /></td>
<td><img src="image" alt="People" /></td>
<td><img src="image" alt="Tree" /></td>
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<tr>
<td><strong>Active Transportation Corridors</strong></td>
<td><img src="image" alt="Graph" /></td>
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False Creek Bridges
Connecting Economic Centres

Bridges Connect BC’s Two Largest Economic Centres & Highest Density Residential Areas
Moving People

Targets to Move More People

For all trips originating in the City of Vancouver. Source: 1994, 1999, 2004, and 2008 Translink Trip Diary Surveys. 1994, 1999, and 2008 data was collected in the Fall, while 2004 data was collected in the Spring and adjusted for seasonal transit variation. 2008 data corrected for removal of 0-4 age group (non included in past survey results). Trips by commercial drivers (couriers, taxis, trucks, and bus drivers) not included.
Population and Jobs in the Walking Catchment

250K Population and Jobs

100K Population and Jobs

~5,000 pedestrians per day across all three bridges

3km Walking Radius
Population and Jobs in the Cycling Catchment

250K POPULATION AND JOBS

220k Population and Jobs

6km Cycling Radius

~5,000 cyclists per day across all three bridges

Transportation Role
Overview of Presentation

Infrastructure Maintenance
  • Past work
  • Current Priorities
  • Future

Transportation 2040 Walking/ Cycling
  • Safety, Issues and Concepts
Infrastructure Maintenance
Past Work on False Creek Bridges
Key Components of a Bridge

- **Structure**: Components holding up the bridge deck
- **Bearings**: Connects the structure to pier/foundation
- **Joints**: Allows for movement in the deck
- **Deck**: The travel surface of the bridge
- **Material**: Concrete, steel, etc
- **Paint**: Covers and protects the materials
- **Heritage Character**
The bridges are structurally robust and reliable, however they are showing signs of aging

- Burrard Bridge ~80 years (concrete railings and soffits)
- Granville Bridge ~60 years (localized concrete surface deterioration)
- Cambie Bridge ~30 years

Regular Inspections are undertaken

Significant work completed on Burrard & Granville (~$26M from 1992-2012)

- Safety
- Maintenance/structural rehab
- Seismic
- Functional retrofits
<table>
<thead>
<tr>
<th>Past Maintenance, Rehabilitation</th>
<th>Burrard Bridge (1992-2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Safety</strong></td>
<td></td>
</tr>
<tr>
<td>• Annual scaling program to remove loose concrete that is spalling from railings and underside</td>
<td></td>
</tr>
<tr>
<td><strong>Seismic Upgrades</strong></td>
<td></td>
</tr>
<tr>
<td>• Concrete and steel spans</td>
<td></td>
</tr>
<tr>
<td><strong>Regulatory Compliance</strong></td>
<td></td>
</tr>
<tr>
<td>• Removal of PCB contaminated grease</td>
<td></td>
</tr>
<tr>
<td>• Compliant to today's regulation requirements</td>
<td></td>
</tr>
<tr>
<td><strong>Structural Rehab</strong></td>
<td></td>
</tr>
<tr>
<td>• Temporary bearing support pending replacement</td>
<td></td>
</tr>
<tr>
<td>• Bearing replacement design initiated</td>
<td></td>
</tr>
<tr>
<td><strong>Preventative Maintenance</strong></td>
<td></td>
</tr>
<tr>
<td>• Expansion joint replacement and complete rehabilitation design package initiated</td>
<td></td>
</tr>
<tr>
<td>• Deck flushing and drainage system repairs</td>
<td></td>
</tr>
<tr>
<td>• Painting and localized deck/ sidewalk patching</td>
<td></td>
</tr>
<tr>
<td><strong>Functional retrofits</strong></td>
<td></td>
</tr>
<tr>
<td>• Reallocation of one lane for bike lane</td>
<td></td>
</tr>
</tbody>
</table>
### Granville Bridge (1992-2012)

<table>
<thead>
<tr>
<th>Past Maintenance, Rehabilitation</th>
</tr>
</thead>
</table>

**Safety**
- Centre crash barrier (Also on Cambie)
- Crash barrier on 4<sup>th</sup> Ave off-ramp
- Crash attenuators on north and south ramps

**Seismic Upgrades**
- Main concrete approaches and steel spans

**Regulatory Compliance**
- PCB lubricating oil drained and destroyed
- Compliant to today’s regulation requirements

**Structural Rehab**
- Concrete girder strengthening

**Preventative Maintenance**
- Expansion joint repairs and deck patching
- Deck flushing and drainage system repairs
- Painting and localized deck/ sidewalk patching
Infrastructure Maintenance
Condition of the City’s Structures
Overview of Structures

- False Creek Bridge
- Rail/Convention Area Streets
- Pedestrian Over/Underpass
- Other Structure

Current Condition

- Convention area streets
- Rail Corridor
- Georgia/Dunsmuir Viaducts

*waterfront structures not illustrated
Condition Assessment

Current Condition

- **Poor:** Should be addressed in the short term
  
  *Note: does not necessarily apply to seismic*

- **Fair:** Should develop a strategy of how to address and undertake in the next couple of capital plans

- **Good/Excellent:** No planned work required
### Overview of Bridge Conditions

#### Minor Structures

<table>
<thead>
<tr>
<th>Category</th>
<th>Structure</th>
<th>Bearings</th>
<th>Joints</th>
<th>Deck</th>
<th>Other</th>
<th>Material</th>
<th>Paint</th>
<th>Seismic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail Bridges</td>
<td>Fair</td>
<td>Good</td>
<td>Fair</td>
<td>Good</td>
<td>Poor*</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Convention Area Streets</td>
<td>Good</td>
<td>Good</td>
<td>Fair</td>
<td>Good</td>
<td>N/A</td>
<td>Good</td>
<td>N/A</td>
<td>Good</td>
</tr>
<tr>
<td>Pedestrian Over/Underpass</td>
<td>Good</td>
<td>N/A</td>
<td>Fair</td>
<td>Good</td>
<td>Fair*</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Waterfront Structures</td>
<td>Poor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Waterfront wharf road, Expo Deck, Cambie Yard Sheet Pile</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Other Misc Structures</td>
<td>Poor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cordova cavity</td>
<td></td>
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</table>
# False Creek Bridge Conditions

## Major Structures

<table>
<thead>
<tr>
<th>Bridge</th>
<th>Structure</th>
<th>Bearings</th>
<th>Joints</th>
<th>Deck</th>
<th>Other</th>
<th>Material</th>
<th>Paint</th>
<th>Seismic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burrard</td>
<td>Good</td>
<td>Poor</td>
<td>Poor</td>
<td>Good</td>
<td>Poor*</td>
<td>Poor</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Granville</td>
<td>Good</td>
<td>Poor</td>
<td>Poor</td>
<td>Good</td>
<td>N/A</td>
<td>Poor</td>
<td>Good</td>
<td>Fair</td>
</tr>
<tr>
<td>Cambie</td>
<td>Good</td>
<td>Good</td>
<td>Fair</td>
<td>Good</td>
<td>N/A</td>
<td>Good</td>
<td>N/A</td>
<td>Poor</td>
</tr>
<tr>
<td>Georgia/Dunsmuir</td>
<td>Fair</td>
<td>N/A</td>
<td>Poor</td>
<td>Good</td>
<td>Poor* Some Joints, Corbels</td>
<td>Fair</td>
<td>N/A</td>
<td>Fair</td>
</tr>
<tr>
<td>Grandview Viaduct</td>
<td>Good</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Good</td>
<td>N/A</td>
<td>Fair</td>
<td>Good</td>
<td>Fair</td>
</tr>
</tbody>
</table>
Infrastructure Maintenance

Future Areas of Focus
2012-14 Capital Plan ($17M)

**Burrard Bridge**
- Bearing replacement
- Localised strengthening of structure
- Concrete repair in high pedestrian zones
- All expansion joints

**Granville Bridge**
- Bearing replacement
- Increased seismic resilience
- 12 of 54 expansion joints
2015-17 Capital Plan: Burrard Bridge

Priority items
• Replace railings and concrete on underside of structure as identified in consultant report rated as poor and requiring attention

Opportunity to coordinate
• Replace lighting fixtures (connected to railings)
• Install permanent cycling facilities and crash barriers

Other items
• Replace wooden marine fenders
Other Bridge Work

- Further expansion joint replacement and concrete repair on Granville Bridge
- Seismic upgrades to Granville and Cambie Bridges
Transportation 2040
Walking/ Cycling
Safety, Issues and Concepts
Burrard Bridge

- Most popular walking/cycling bridge
- Tremendous growth in walking/cycling in last 3 years
- High collision locations at both ends
- Long & numerous crossings for vulnerable road users
- East sidewalk currently closed to pedestrians
- Northbound bike lane has capacity constraints

Walking/Cycling 
Issues/Concepts

Permanent west side cycle facility
Pedestrians back on east side
Simplify intersection
Safety Improvements
Granville Bridge

- High potential for increased walking/cycling
- No separation of travel modes
- Sidewalks are narrow without buffer from traffic
- Crossings of ramps are uncomfortable and not accessible
- Lack of cycling facilities leads to sidewalk riding
Granville Bridge

*Granville Bridge with two lanes reallocated*

*Conceptual illustration only. Subject to further study and consultation.*
• Projected to have significant walking/cycling growth in the future
• A bicycle connection is missing from east pathway to Beatty
• The east side shared path has an existing high number of conflicts and will reach capacity by 2020
• No separated cycling facility on west side
Summary of Issues
Summary

Synergy between Maintenance and Transportation Improvements

- Significant amount of scheduled and upcoming maintenance work will create transportation disruption in the next 5 years
- Railings replacement on Burrard will require multiple lanes to be closed for extended duration
- Maintenance work presents an opportunity to change infrastructure to address mobility issues
- Work needs to be coordinated across three bridges to minimise disruption
Underway

• Granville seismic upgrades, bearing and joint replacement
• Burrard bearing replacement design 95% complete, bearings and joints to be replaced in 2014. Full rehabilitation design package 60% complete.
• South end of Burrard under review with Point Grey/Cornwall Active Transportation Corridor Project
• Cambie Bridge north end walking/ cycling spot improvement
Summary

Next Steps

Further Design Development

- Work with stakeholders to refine Active Transportation concepts for all False Creek Bridges - 2013
- Develop coordinated maintenance/transportation strategy and detailed design – early 2014
- Burrard Bridge Active Transportation implementation coordinated with railing replacement in next capital plan 2015

Capital Planning

- Incorporate strategy in 10 year capital outlook and future 3 year capital plan processes
## 2012-2014 Capital Spend Summary

### Bridge Rehab

<table>
<thead>
<tr>
<th>Maint./ Rehab</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burrard</td>
<td>0.5M</td>
<td>3M</td>
<td>6M</td>
<td>9.5M</td>
</tr>
<tr>
<td>Granville</td>
<td>0.7M</td>
<td>9M</td>
<td></td>
<td>9.7M</td>
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</table>

### Active Transportation Corridors

<table>
<thead>
<tr>
<th>Safety</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burrard/ Cornwall</td>
<td></td>
<td></td>
<td>*</td>
<td>5M available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mobility</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambie North end spot improvement</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

*Design and cost estimates under development 5M of funding available*
Questions?