Confederation Line West Alignment Improvement
West of Cleary Avenue
September 14th, 2016
• Background
• Environmental Assessment Alignment Challenges
  – Narrow Corridor
  – West Nepean Collector
  – Decking Requirements
  – Impact on Adjacent Properties
  – Enhanced Byron Linear Park
• Improved Alignment Benefits
• Other Considerations
Background

• Spring 2016, design modifications were recommended at Cleary Station

 ✓ The shift of the LRT alignment at Cleary Station was included in the Confederation Line West Environmental Assessment (EA)

• Preliminary engineering design work has been ongoing and staff identified an additional alignment improvement, just west of Cleary

• The recommended alignment improvement shifts the alignment approximately 15 metres south, between approx. Cleary and Woodroffe
EA Alignment Challenges

- Narrow 12 metre corridor for the 10.5 metre wide tunnel
- Tight proximity to West Nepean Collector (WNC) sewer significantly increases risk of damage and potential community impacts (WNC serves 200,000 people in Ottawa)
- Construction impacts affect Byron Linear Park, severely limiting public use of the park
- Extensive traffic decking required and increased traffic impacts
- Major utility relocates required, increasing risks and disruptions to major utilities
- Limited construction staging and mobilization options (north side of Richmond is not feasible given proximity to businesses and residents)
- Proximity to adjacent properties increases risk of construction impacts
Benefits of Improved Alignment

- Reduced traffic impacts (for all modes)
- Shorter construction duration
- Bigger and improved Byron Linear Park
- Fewer risks and disruptions to major utilities
- Reduced property and business impacts
Improved Alignment Benefits

- Increased corridor, in excess of 20 metres, for the 10.5 metre wide tunnel
- Increased proximity to West Nepean Collector (WNC) with reduced construction risk to the WNC
- Significantly reduced utility relocates and fewer risks and disruptions to major utilities
- Reduced traffic decking required and improved traffic flow for all modes
- Increased proximity to adjacent properties and reduced property and business impacts
- Reduced cost and construction duration (by approximately 5-6 months)
- Opportunity for bigger and improved Byron Linear Park restoration
EA Alignment – Narrow Corridor
Richmond Tunnel Alignment

- Park
- Tunnel box width (10.5 metres)
- West Nepean Collector (WNC)

Length of WNC within 2 metres of tunnel wall: 425 metres
Byron Tunnel Alignment

- Park
- Tunnel box width (10.5 metres)
- West Nepean Collector (WNC)
- Length of WNC within 2 metres of tunnel wall: 42 metres
- Structure over top of WNC
The West Nepean Collector (WNC) is a combined sanitary and storm sewer, serving approximately 200,000 residents.

Tunnel alignment under Richmond is less than 2 metres away from the WNC for 450 metres.
- One section of the WNC is less than 1 metre away from the wall of the tunnel.
- Includes shoring on top of sewer.

Rock excavation and shoring in such close proximity to a major trunk sewer is risky and difficult to mitigate.

Shifting the tunnel alignment under Byron Linear Park increases the proximity to 4-6 metres.
- Only 45 metres of tunnel are within 2 metres of the WNC.
- Includes shoring adjacent to sewer (further away).
Proximity to WNC

Current Alignment

- WNC 970mm

Improved Alignment

- WNC 3470mm
Decking Requirements

REQUIRED DECKING
Current Alignment Option 1
- Decking

REQUIRED DECKING
Current Alignment Option 2
- Decking
- Road access
- Road closed

REQUIRED DECKING
Improved Alignment
- Decking
Decking Examples
Utility Relocations

• The Richmond Road tunnel alignment requires major utilities to be relocated out of the Richmond Road right-of-way

• With the tunnel running under Byron Linear Park, utilities in Richmond Road can remain in place
  – Little to no need for utility shutdowns
Impacts to Byron Linear Park

- Byron Linear Park is impacted by construction under both scenarios:
  - EA alignment includes impacts to 50% of the park footprint
  - Improved alignment includes 100% park impact footprint
- The 50% impact is a result of construction staging requirements which cannot be accommodated on the north side of Richmond given the close proximity to residences and businesses
- The tunnel alignment under the park impacts the entire park, but cost savings associated with this option allow for an enhanced park restoration
Impacts to Byron Linear Park

BYRON PARK IMPACTS
Current Alignment
- Impacted area
- Non-impacted area

BYRON PARK IMPACTS
Improved Alignment
- Impacted area
- Non-impacted area
Environmental Impact
Trees

- With the tunnel under Richmond, construction staging between Cleary and Woodroffe (with 50% park impact) impacts over 50% of trees:
  - 60-75 % of small trees (0-10 cm dbh, 20-25 existing trees)
  - 70-75 % of medium sized trees (11-30 cm dbh, 250-265 existing trees)
  - 60-70 % of large trees (> 30 cm dbh, 25-30 existing trees)

- Some small trees can be transplanted pre-construction
LRT Alignment, West of Woodroffe
New Orchard Station
New Orchard Station
### Forecasted Ridership

<table>
<thead>
<tr>
<th>Station</th>
<th>Total Boardings and Alightings (2031, AM Peak Hour)</th>
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<tbody>
<tr>
<td>New Orchard</td>
<td>636*</td>
</tr>
<tr>
<td>Pinecrest</td>
<td>640</td>
</tr>
<tr>
<td>Queensview</td>
<td>540</td>
</tr>
<tr>
<td>Lees</td>
<td>708</td>
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<tr>
<td>Montreal</td>
<td>509</td>
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*New Orchard Station is busier than 12 other Stage 2 stations*
• In addition to the above stated benefits, the recommended tunnel alignment under Byron Linear Park:
  – Reduces the overall construction duration by 5-6 months
  – Includes a capital cost savings of $12-20 million (depending on the decking option)
  – As a result of the capital cost savings, the City can return the park to the community in an enhanced state for increased enjoyment
Enhanced Park Restoration

• What does this include?
  – Significant planting of properly sized trees and specific species of trees, in consultation with the community
  – New multi-use pathways to complement Richmond Road Complete Street initiative
  – Review opportunities to implement an active and/or passive park features, in consultation with the community
  – Removal of old rail bed and reinstatement of improved soil
  – Review opportunities to expand the park and make it more contiguous, in consultation with the community
Richmond Complete Streets/
Byron Linear Park Park Themes
Richmond Complete Streets/
Byron Linear Park
Themes
Next Steps

• Upcoming opportunities for public comment:
  – Environmental Assessment process
    • Notice of Completion (September 30, 2016)
  – Staff report outlining recommended design improvements:
    • Finance and Economic Development Committee (Fall 2016)
    • City Council (Fall 2016)
Questions?
Cut and Cover Decking

1. Utility location and piling
2. Installation of decking
3. Excavation and soil removal
4. Construction of underground structure
5. Removal of decking/street restoration
Connectivity Study
Cleary Station
Connectivity Study
New Orchard Station