Utility Relocation Innovations

vivaNext Bus Rapid Transit Projects

Steve Murphy
Tuesday, December 5, 2017
Agenda

• Introduction to York Region

• vivaNext Bus Rapid Transit program

• Challenges

• Innovations
Utility Relocation Innovation - BRT
Utility Impacts at a Glance - BRT

Utility Impacts at a Glance
Issues

• Time

• Design Bid Build vs. Design Build delivery model
Utility relocation innovations required for Design-Build delivery model
Scissors Jump – Utilizing Standard Processes

A way to get over the bar and still land on your feet. Very limited in the height one can jump.
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Section 1 - Before
vivaNext Bus Rapid Transit Program

Section 1 - Vision
Scissors Jump

Assumptions

• Implement Regional standard utility relocation process
• Utilize standard utility corridors
• Commence utility relocation design at 30% Detailed Design
Community Liaison

Sophia Bittar
Community Liaison
Yonge Street, Newmarket
Scissors Jump

Issues

• Insufficient timelines and design

• Enhanced streetscaping

• Limited boulevard for utility infrastructure

• Insufficient underground mapping of existing corridor

Identify the issues in order to develop the next innovations
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Section 1
Utility Relocation
vivaNext Bus Rapid Transit Program
Eastern Roll innovation raised the level to jump a little higher.
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Section 2 - Before
vivaNext Bus Rapid Transit Program

Section 2 - Vision
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Lessons learned from Section 1:

• Transferred the task of utility coordination to the Design-Build
Lessons learned from Section 1:

• Developed Context Sensitive typical utility cross section(s)
Lessons learned from Section 1:

- Implemented joint use trench/structures for telecoms
Eastern Roll

Lessons learned from Section 1:

• Implemented tighter utility installation quality control measures
Lessons learned from Section 1:

- Created unknown field conflict resolution process for efficient decision making
Excellent communication key to successful project delivery

Eastern Roll

Lessons learned from Section 1: Community Liaison Innovation

• Originally one Community Liaison for entire BRT Program

• Then changed to one or more per section

<table>
<thead>
<tr>
<th>Community Liaisons</th>
<th>Vaughan - Highway 7 West</th>
<th>Yonge Street - Newmarket</th>
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<tbody>
<tr>
<td></td>
<td>Michelle Goland</td>
<td>Sophia Bittar</td>
</tr>
<tr>
<td>Tel: 905.886.6767 Ext. 71051</td>
<td>Cell: 416.797.5653</td>
<td>Tel: 905.886.6767 Ext. 71116</td>
</tr>
<tr>
<td>Email: <a href="mailto:michelle.goland@york.ca">michelle.goland@york.ca</a></td>
<td></td>
<td>Cell: 905.806.0713</td>
</tr>
<tr>
<td></td>
<td>Diana Kakamousias</td>
<td>Sophia Bittar</td>
</tr>
<tr>
<td>Tel: 905.886.6767 Ext. 71181</td>
<td>Cell: 905.251.7587</td>
<td>Tel: 905.886.6767 Ext. 71357</td>
</tr>
<tr>
<td>Email: <a href="mailto:diana.kakamousias@york.ca">diana.kakamousias@york.ca</a></td>
<td></td>
<td>Cell: 905.505.1430</td>
</tr>
<tr>
<td></td>
<td>Leslie Pawlowski</td>
<td>Email: <a href="mailto:lesle.pawlowski@york.ca">lesle.pawlowski@york.ca</a></td>
</tr>
<tr>
<td>Tel: 905.886.6767 Ext. 71062</td>
<td>Cell: 289.338.6733</td>
<td></td>
</tr>
<tr>
<td>Email: <a href="mailto:sindiswa.moyo@york.ca">sindiswa.moyo@york.ca</a></td>
<td></td>
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Eastern Roll

Lingering Issues:

• Road design not at completeness level to determine scope of utility relocation
  • Many iterations in utility relocation design

• Identifying existing utilities in the corridor
  • Subsurface Utility Engineering investigation occurred too late in design process

• Lack of certainty of construction scheduling
  • Road and utility relocation

• Utility resourcing issues
  • Design and construction
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Section 2
Utility Relocation
Western Roll innovation once again increased the level to jump even higher.
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Section 3 - Before
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Section 3 - Vision
Western Roll

Lessons learned from Sections 1 and 2:

• Implemented a Subsurface Utility Engineering (SUE) investigation earlier in design process

Better underground infrastructure information and safer work zones
Western Roll

Section 3 utility cross section developed earlier in design process

- Proposed cross-section with minimum clearances defined
Western Roll

Lessons learned from Sections 1 and 2:

• Developed an initial utility relocation plan utilizing Section 3 cross section
  • Determine utility corridor issues prior to engaging utility companies in design
  • Leads to fewer design iterations
Lessons learned from Sections 1 and 2:

- Piloted Enbridge and York Region Senior Management working group
  - Improve communications
  - Resolve resourcing problems
  - Increase certainty for design and construction schedules
Lingering Issues:

- Encounter numerous iterations in utility relocation design
- Need for greater construction scheduling certainty by Design-Build earlier in relocation process
- Need better understanding of what/when to ask utility companies for information
-Insufficient time allotted to relocate utilities prior to road construction
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Section 3 - Utility Relocation
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A highly innovative technique that sends the jumper over the bar head first and backwards, thus moving one’s centre of gravity throughout the jump to achieve greater heights.
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Section 4 - Vision
vivaNext Bus Rapid Transit Program

Section 4 - Before
Section 4 - Vision
Fosbury Flop

Lessons learned from Sections 1, 2 and 3:

• Developed Utility Relocation Process flow charts with impacted utility companies
Fosbury Flop

Lessons learned from Sections 1, 2 and 3:

• Implemented Senior Management working groups with all affected utility companies
Fosbury Flop

Lessons learned from Sections 1, 2 and 3:

• Negotiated additional utility agreements/arrangements for the benefit of the project schedule
Fosbury Flop

Lessons learned from Sections 1, 2 and 3:

• Joint Trench Procurement
  o Prequalified contractors list
  o Tender evaluation and award criteria
    ▪ 3 Tenders = 1 Contractor

Negotiate prequalified contractors, tender evaluation and award criteria
Fosbury Flop

Lessons learned from Sections 1, 2 and 3:

- **3D Subsurface Model**
  - Improved utility coordination
  - Ease of redesign

3D modelling of underground utilities for efficient utility coordination
Fosbury Flop

Lessons learned from Sections 1, 2 and 3:

• Enabling Work Process
  o Advanced conflict removal of utility alignment

Create utility enabling work process to ensure commencement of relocations
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Yonge Street

Highway 7 West
Enhance Utility Relocation Design and Construction

Proper Utility Coordination utilizing SUE Investigations to:

- Understand the existing corridor
- Wisely choose the use of SUE QL-A (Test Holes)

Original MC Approval
Enhance Utility Relocation Design and Construction

Revised MC Approval

Enhance Utility Coordination utilizing SUE Investigations
What Heights Can We Attain in the Relocation of Utilities?

- Standard Utility Relocation Process and Utility cross section
- Community Liaison position for BRT program
- Utility Cross Section Developed for corridors
- Telecom joint trench/structure
- Installation tolerances
- Field Resolution Process
- One Community Liaison per project
- Implemented SUE investigation earlier in design
- Early development of utility relocation plan
- Implementation of Enbridge Gas Working Group
- Utility Relocation Process Flow Charts
- Utility Senior Management Working Groups
- Additional utility agreements / arrangements
- Procurement process for joint trench installations
- 3D modelling
- Enabling works
Best Practices for Utility Relocation Coordination

• Understand the existing corridor early in the planning and design process

• Negotiate additional utility agreements and arrangements in the planning phase

• Develop Utility Relocation and Field Conflict Resolution Processes to manage the time/schedule component in Design and Construction

• Implement Senior Management Working Groups and Community Liaison position to foster excellent communication
Questions?

Steve Murphy
Senior Utility Coordinator
steve.murphy@t2ue.com