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



Consult with utility stakeholders prior to creating early schedule plan

High Jump Innovation Analogy



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.







Scissors Jump



Community Liaison



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





Eastern Roll Innovation

Eastern Roll innovation raised the level to jump a little higher.







Lessons learned from Section 1:

• Transferred the task of utility coordination to the Design-Builder



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



Lessons learned from Section 1:

• Implemented tighter utility installation quality control measures



Tight quality control measures improve construction delivery schedule 22

Lessons learned from Section 1:

Created unknown field conflict resolution process for efficient decision making



Lessons learned from Section 1: Community Liaison Innovation

- Originally one Community Liaison for entire BRT Program
- Then changed to one or more per section

Community Liaisons

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Excellent communication key to successful project delivery

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







Western Roll Innovation

Western Roll innovation once again increased the level to jump even higher.







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

Section 3 utility cross section developed earlier in design process

• Proposed cross-section with minimum clearances defined



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-Builder 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







Fosbury Flop Innovation

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.



Lessons learned from Sections 1, 2 and 3:

 Developed Utility Relocation Process flow charts with impacted utility companies

Lessons learned from Sections 1, 2 and 3:

Implemented Senior Management working groups with all affected utility companies

Engage utility stakeholders throughout project delivery

Lessons learned from Sections 1, 2 and 3:

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

Negotiate additional utility agreements/arrangements

Lessons learned from Sections 1, 2 and 3:

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

Negotiate prequalified contractors, tender evaluation and award criteria

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

Lessons learned from Sections 1, 2 and 3:

- Enabling Work Process
 - Advanced conflict removal of utility alignment

Create utility enabling work process to ensure commencement of relocations

..... 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 Coordination utilizing SUE Investigations

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

Scheduling/Cost Efficiencies for Utility Relocations

 Community Liaison position for BRT program

- 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

Utility Coordination through Collaborative, Cooperative, Communications 53

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