

## Valley Line Southeast LRT

### Challenges that Impacted Schedule

Issue	Summary of Issue	Summary of Resolution	Lessons Learned
<b>Tawatinâ Bridge (June 2018)</b>	<p>TransEd encountered a block of concrete from the original Cloverdale footbridge under the North Saskatchewan River bed when driving piles as part of the construction of the Tawatinâ Bridge.</p>	<p>The risk related to bridge design and construction, including unknown ground conditions, had been transferred to TransEd as part of the contract. TransEd was responsible for identifying, designing and constructing the resolution for this challenge. TransEd ultimately adjusted the pile design and dewatering procedures to reflect the existing conditions, and work resumed on the construction of the Tawatinâ Bridge foundation.</p>	<p>Where possible and practicable, information on record drawings should be validated to confirm their accuracy.</p> <p>In this instance, the P3 contract structure successfully protected the City's interest and exposure as the risk and responsibility for both design, construction and unknown ground conditions was transferred to the contractor.</p>

**Attachment 4**

<p><b>Churchill Station (summer 2019)</b></p>	<p>When TransEd was constructing the new Churchill Connector abutting the existing Churchill LRT Station, there was one area where construction of the original station was not as-shown on the original record drawings. As a result, TransEd inadvertently impacted some reinforcing steel while removing what was thought to be excess concrete.</p>	<p>Work in the area was stopped while TransEd investigated the issue. TransEd ultimately adjusted the design to reflect existing conditions and work resumed.</p>	<p>Where possible and practicable, information on record drawings should be validated to confirm their accuracy.</p> <p>In this instance, the P3 contract structure successfully protected the City's interest and exposure as the risk and responsibility for validating the accuracy of record drawings of existing infrastructure was transferred to the contractor.</p>
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<p><b>TPSS Compliance with Canadian Electrical Code (beginning Nov 2019)</b></p>	<p>The Traction Power Substations (TPSS) / Utility Complexes provided by TransEd were designed and manufactured off-site. When they were inspected by the authority having jurisdiction and the electric utility company (EPCOR) prior to being energized, a Canadian Electrical Code compliance issue relating to a disconnect switch location was identified.</p> <p>Additional work was required before TransEd was able to have the Traction Power Substations energized. This resulted in a delay to train testing for some areas of the alignment.</p>	<p>This was a code interpretation issue as well as an electric utility connection issue that was not identified until the TPSS units arrived on-site for final inspection. TransEd worked with the local code inspector and EPCOR to develop a solution that met the code requirements and utility connection requirements specified in the contract. Once an acceptable solution was agreed upon, TransEd installed additional equipment to bring the TPSS into compliance. This was done at no cost to the City.</p>	<p>The P3 contract structure successfully protected the City's interest and exposure as the risk and responsibility for design, construction and compliance with all relevant codes and standards was transferred to the contractor.</p> <p>In this case, TransEd was responsible for ensuring all equipment met the required codes and standards before being put into service.</p>
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<p><b>COVID-19 Pandemic (beginning March 2020)</b></p>	<p>COVID-19 was declared a worldwide pandemic by the World Health Organization (WHO) in March 2020. This resulted in government restrictions, such as travel restrictions, isolation requirements and closures of businesses, including manufacturers and suppliers worldwide. This affected the availability of workers and supply chains for construction projects both locally and globally</p>	<p>The City's contract with TransEd expressly included a process by which to deal with a pandemic. This process was designed to avoid the uncertainty occurring in other jurisdictions and contracts dealing with COVID-19 issues. The City and TransEd worked together to mitigate some of the supplier-related issues, and TransEd expedited work where possible due to reduced vehicle and pedestrian traffic.</p>	<p>Having a robust contract that includes clear language on how unforeseen events will be managed reduced the potential for broad-based claims and disputes.</p>
<p><b>Piers Cracking (July 2022)</b></p>	<p>During testing and commissioning in July 2022, cracks were discovered in the majority of the piers for the elevated guideways. A root cause analysis conducted by TransEd indicated a combination of design and construction issues.</p>	<p>TransEd retained full responsibility for investigating the cause of the pier cracking and repairing the piers at their own cost. The piers were repaired with a combination of structural steel and concrete reinforcement. TransEd retains responsibility for these piers in the future.</p>	<p>The P3 contract structure successfully protected the City's interest and exposure as it included transferring risk and responsibility for both design and construction to the contractor.</p>

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<p><b>Signalling Cable Replacement (2023)</b></p>	<p>During testing and commissioning, TransEd discovered premature corrosion of certain signalling cables that could impact system stability in the future.</p>	<p>TransEd replaced all of the impacted cables and included additional waterproofing. TransEd conducted testing to ensure the new cables worked as expected. TransEd retains the responsibility to maintain these cables in the future.</p>	<p>The P3 contract structure successfully protected the City's interest and exposure as it included transferring risk and responsibility for both design and construction to the contractor.</p> <p>In this case, because TransEd is responsible for operating and maintaining the system until 2050, TransEd determined that replacing the cables prior to passenger service was in the best long-term interest of LRT operations. A key benefit of P3 contracts that include operations and maintenance is that decisions are made that incorporate both capital and operating impacts.</p>
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Additional Impacts

Issue	Summary of Issue	Summary of Resolution	Lessons Learned
<b>Design Delays (beginning 2017)</b>	TransEd did not complete all of the project designs in accordance with the design schedule that TransEd set out for itself at the start of the project in 2016.	TransEd prioritized design efforts and rescheduled design work to support the planned construction activities in order to not delay construction work.	The P3 contract structure successfully protected the City's interest and exposure as it included transferring risk and responsibility for both design and construction.
<b>Whitemud LRT Bridge Girder (2018)</b>	During routine quality control reviews following stripping of the concrete forms for one of the girders of the LRT bridge over Whitemud Drive, TransEd noted concrete deficiencies that did not meet the requirements of the Project Agreement. A root cause analysis by TransEd indicated a construction issue.	TransEd determined that repairing the concrete deficiencies was not feasible and ultimately decided to recast the girder before installing it in its final position over Whitemud Drive.	The P3 contract structure successfully protected the City's interest and exposure as it included transferring risk and responsibility for both design and construction to the contractor.
<b>Davies Elevated Guideway Girders (2020)</b>	During routine infrastructure inspections of the Davies elevated guideway girders, TransEd discovered larger-than-expected cracks on three of the girders. A root cause analysis conducted by TransEd indicated a combination of design and construction issues.	TransEd determined that repairing the cracks was not feasible and ultimately decided to remove, recast and reinstall the three cracked girders.	The P3 contract structure successfully protected the City's interest and exposure as it included transferring risk and responsibility for both design and construction to the contractor.