

Valley Line Southeast Performance Measures

This attachment provides insight into the metrics that are being used to measure and monitor the performance of the Valley Line Southeast project during construction and after service commencement.

During Construction

Construction Progress (Public Quarterly Reporting)

Administration shares a public update detailing project progress on a quarterly basis via the Valley Line Southeast page on Edmonton's website under 'Quarterly Reports.' The report for Q1 2018 is included in CR_5870 as Attachment 4. The quarterly report communicates project management cost and schedule performance indices.

Cost performance is currently trending slightly under the expected expenditures as planned by TransEd. The contract is based on a fixed cost, therefore slight variations to the cash flow throughout construction are not of concern. The cost performance for the Valley Line is currently trending at 101% (slightly under budget) with almost all design packages submitted.

Schedule performance is at 84 percent as measured against the submitted baseline schedule, meaning that progress is behind what was originally planned by TransEd. The most pressing issue at present is the state of construction of the Tawatina Bridge, which is behind schedule.

Changes to the Project Agreement (Design Development Change Records)

One change order has been made to the contract. The change order encompasses minor design development change records ("DDCRs") that can be classified as either City or TransEd requests.

The Valley Line Southeast Project Agreement includes numerous detailed requirements without allowing much flexibility for variation. The contract administration team treats any instances of requested flexibility with strict review and acceptance criteria, including formal documentation of any variations to the contractual specifications. They are formalized through design development change records and change orders.

For the majority of TransEd-generated DDCRs, the request was to propose "equal or better" variances to the technical requirements specified in the Project Agreement in order to suit innovative construction means and methods planned

by TransEd. Administration evaluated each request to determine if the change met the spirit and intent of the specification, and if there were any schedule or cost implications. Some examples of TransEd requested amendments include:

- steel and concrete material technical requirements
- construction means and methods technical requirements
- variance to technical requirements not achievable in a specific location due to site-specific constraints

For Administration-generated changes, some requests were made by the Administration to TransEd to amend requirements within the Project Agreement based on new and/or revised knowledge. Examples of Administration-generated revisions are:

- incorporation of Smart Fare technology for ETS fare collection
- revision to customer service information at stops
- noise wall modifications as a result of public engagement requests
- select addition of small scopes of work from adjacent projects to prevent future rework (One City approach)
- miscellaneous curb return adjustments as a result of coordination with adjacent properties and projects
- and miscellaneous geometry changes after coordination with Office of Traffic Safety

Quality of Construction

(TransEd Quality Manager; Owner's Engineer Team; City of Edmonton)

A number of different parties are continuously observing, inspecting and evaluating the work that is being performed on and off-site for the Valley Line LRT construction. The prime responsibility for ensuring acceptable quality has been contracted to TransEd. The underlying assumption is that, because TransEd is performing both the design as well as operation and maintenance for 30 years following construction, they are both best positioned (because they are the designers who best understand the constraints of their design) and motivated (because they are operating/maintaining the system for 30 years) to ensure that the quality is acceptable.

The Project Agreement with TransEd mandates:

1. TransEd is solely responsible for quality;
2. TransEd's quality program is to be certified ISO 9001:2008 compliant (Administration is in the process of updating this requirement to be ISO 9001:2015 compliant);
3. TransEd is to retain a Quality Director and a Quality Manager who are responsible for quality and who are independent of those who are responsible for construction;

4. The work is reviewed by representatives from the designer, referred to as the Field Review Engineers who are also independent of the construction team.

The above ensures accountability for construction quality within TransEd. The Quality Manager directs and is responsible for the quality team who performs and documents inspections on every work element. All deficiencies noted during these inspections are addressed by the appropriate parties noted above.

There are elements of the Valley Line system that will be handed back to the City after the 30 year operating period, but long before the end of the design service life of the system or structure. Also, there is some infrastructure like roads and underground drainage which will be turned over to the City after a two year warranty period. Therefore, in addition to TransEd's quality management system, Administration retains its own engineering team (the Owner's Engineer, OE) whose role it is to ensure that both the design and construction are in compliance with the requirements of the contract and to assist Administration in ensuring that these elements are designed and constructed in such a way that their intended lifecycle will be achieved.

The OE team's construction observations are documented in reports which identify any items that may not comply with the requirements of the contract. All such observations are discussed with discipline specific teams within the OE team and if it is determined that there may be a non-compliance, the issue is brought up directly with both Administration and TransEd. Weekly meetings are held with the OE, Administration and TransEd to discuss and resolve issues which have been identified.

There are 15-20 specialists from the OE team who are regularly in the field to review construction progress. The OE assesses the criticality of the current work and determines whether to perform site visits daily or whether a reduced frequency is appropriate. On average, there are approximately 70 reports completed by the OE team every week.

In addition to this, on the seventh year and the second year before handback (which occurs at the elapsing of the 30-year Operations and Maintenance period), the Administration and TransEd will perform a joint inspection and survey of all system components and assets, as well as a historical review of all maintenance records.

If any component or asset is not in a condition consistent with handback requirements, TransEd and Administration will determine a list of handback deficiencies that TransEd is required to correct. Should these deficiencies not be addressed, Administration will hold back remaining operations payments

accordingly, as per Schedule 16 (Payment Mechanism) of the Project Agreement.

**Environmental Management
(ISO 14001:2015 Compliance; Provincial and Municipal Permitting)**

As a requirement of the Project Agreement, TransEd has developed and implemented an ISO 14001:2015 compliant Environmental Management System (EMS). The EMS provides a systematic framework and processes to protect the environment, improve performance, and ensure environmental compliance.

TransEd has secured all relevant federal, Provincial and Municipal environmental permits and approvals required for construction of the project. To ensure compliance with the project's environmental requirements, TransEd has implemented an environmental compliance monitoring and inspection program and submits weekly monitoring and inspection reports to Administration. Administration also conducts periodic audits and environmental monitoring throughout the project area.

Internal EMS compliance audits are conducted every 6 months and external EMS compliance audits are conducted annually. These audits are conducted following the Guidelines for Auditing Management Systems, ISO 19011.

To date all audits have concluded that TransEd has been satisfactorily implementing its environmental management system.

**Non-Performance Events (NPEs)/Non-Conformance Reports (NCRs)
(Self-Reported per Project Agreement)**

The Project Agreement includes a list of NPEs and NCRs tied to specific contractual requirements, along with the points assigned to each. TransEd self-reports all NPEs and NCEs on a monthly basis. Non-conformances may be process or output related, and may be non-conforming to the Project Agreement or TransEd's own internal requirements.

Points and payment adjustments to TransEd are allocated as per Schedule 16 of the Project Agreement, which can be found online on the City's Valley Line website.

Administration is not able to release or discuss specifics around the total number of points or financial deductions accrued during the project due to commercial confidentiality.

**Contract Performance
(Value for Money, Project Management Review, Communications)**

When TransEd was selected as the successful proponent for the Valley Line Southeast contract, a Value for Money analysis was conducted which identified a Value for Money savings ranging between 17-25% compared against traditional procurement methods.

Administration continues to monitor the contract performance to ensure that the value for money obtained is as calculated per the procurement process. This is one way of measuring contract performance.

In addition, an assessment of the contract administration and project management performance will be conducted at end of construction.

With respect to public responsiveness and contract performance, TransEd is obligated to follow the contractual requirements of Schedule 12 (Communications), which includes (among other items) defined response times to inquiries, obligations around public notification about construction events, and a requirement to maintain an inquiry management system. TransEd tracks the number and type of complaints submitted by citizens, businesses, and other parties. This information is then analyzed for trends and shared with Administration.

**Bombardier LRV
(Independent Certifier)**

Bombardier recently completed the Valley Line LRT prototype vehicle, on schedule, which was inspected and verified by the Independent Certifier. Administration visited the assembly facility in Kingston, Ontario in 2017 and 2018. Administration's OE team audited the facility's processes in relation to the prototype vehicle assembly, which included an on-site visit and direct observance of the vehicle.

TransEd's progress with the LRVs is continually monitored. In addition, an Independent Certifier conducted rigorous inspections of the processes and LRV prototype with favourable results.

After Service Commencement

A number of metrics will be used to measure how effectively TransEd is delivering service. Tracking and reporting will begin when service commences, and will include details of all scheduled trips such as departure time at each stop, train length, first and last stop served per trip, details of any deficiencies such as disruptions to passenger service, system ride quality, noise and vibration monitoring, customer satisfaction survey results, maintenance activities, non-conformities, cumulative LRV kilometres per LRV, and energy consumption certificates.

**Customer Service
(Operations Plan; Real-Time LRV Monitoring; Monthly Reporting)**

TransEd is required to develop an overall operations plan consistent with the requirements in the Project Agreement 180 days in advance of Service Commencement. This plan will include detailed information including but not limited to: travel times, schedule of service for each stop and station, and train consist lengths. The Project Agreement requires that 32 minute end to end run times are achieved at 5 minute train frequency.

The LRVs are equipped with real time location monitoring which will be tracked and reported by TransEd as part of their monthly reports. Administration will develop a system that parallels TransEd's performance reporting to validate that the results are representative of service delivered, and payment will be issued based on adherence.

Any deficiencies in operations will be subject to payment adjustments which are deducted directly from the monthly operating payment as per Schedule 16 (Payment Mechanism).

The drafting of the Project Agreement incorporated several requirements to provide excellent customer service to riders. These include expectations around custodial maintenance, customer satisfaction, public announcements/messaging, noise/vibration, and other similar requirements. Failure to adhere to these requirements triggers non-performance events listed in Schedule 16 (Payment Mechanism).

TransEd is also required to develop a customer service plan consistent with the requirements in the PA 180 days in advance of Service Commencement. This plan will describe TransEd's approach for delivering excellent customer service, policies to empower employees to encourage excellent customer service, and internal procedures to measure customer service satisfaction through surveys.

TransEd is required to submit monthly reports during the operating period which are linked to payment. The monthly reports include calculations and supporting documentation regarding each input for the payment formula.

Administration will perform its own auditing of the service and processes. Payment adjustments and/or non-performance events apply if TransEd fails to meet the service requirements outlined in the Project Agreement.

Downtime and safety events must be reported to Administration as well as TransEd's own governance board. Throughout each month, TransEd is required to provide the level of service specified by the City. Administration has oversight

responsibility to confirm whether or not TransEd has met the defined performance requirements. If TransEd does not meet the defined performance requirements payment adjustments will be applied as per Schedule 16 (Payment Mechanism).

**Safety Performance
(Monthly Reporting)**

TransEd is required to submit monthly reports to both Administration and its own governance board which include statistics on the nature and frequency of safety incidents. Administration will review these and can audit aspects at its discretion.

**Service Levels/Outcome Achievement
(Project Agreement)**

The Project Agreement was structured to allow Administration flexibility to adjust the level of service requirements to respond to ridership levels. The maximum intended ridership is the upper end of the scale, and at any time Administration can request, given a notice period, that TransEd increase the capacity to allow for the maximum intended ridership (Administration can similarly decrease the requirement, should it be advantageous to do so). TransEd is required to provide the requested level of service, as defined by the contract, or they face financial penalties.

There are 14 service levels outlined in the PA representing different arrangements of train configuration (i.e. two car train vs. one car train). The highest service level, 14, has a capacity of about 6500 pphpd (passengers per hour per direction), where TransEd will run a two car train every 5 minutes.

Early projections for Valley Line Southeast estimate ridership upon service commencement at 31,500 person-trips per day. The City will be able to monitor ridership by collecting data from SmartFare machines, and adjust ridership levels in its contract with TransEd accordingly.