

Subject: Stage 2 Trillium Line and Confederation Line Update

File Number: ACS2023-TSD-RCP-0015

Report to Light Rail Sub-Committee on 27 October 2023

Submitted on October 18, 2023 by Renée Amilcar, General Manager, Transit Services Department

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Ward: Citywide

Objet : Mise à jour concernant la Ligne Trillium et la Ligne de la Confédération dans le cadre de l'Étape 2

Numéro de dossier : ACS2023-TSD-RCP-0015

Rapport présenté au Sous-comité du train léger

Rapport soumis le 27 octobre 2023

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Quartier : À l'échelle de la ville

REPORT RECOMMENDATION(S)

That the Light Rail Sub-Committee receive this report for information.

RECOMMANDATION(S) DU RAPPORT

Que le Sous-comité du train léger prenne connaissance du présent rapport à titre d'information.

BACKGROUND

On March 6, 2019, Council approved the Contract Award of Ottawa's Stage 2 Light Rail Transit Projects and Related Matters report ([ACS2019-TSD-OTP-0001](#)).

TransitNEXT was awarded the contract to design, build, finance, and maintain the Trillium Line extension, including the Airport Link. The Trillium Line will operate from Bayview Station to Limebank Station (Line 2) and include the Airport Link (Line 4).

East/West Connectors (EWC) was awarded the contract to design, build, and finance the Confederation Line extensions. The project will extend Line 1 from Blair Station to Trim Station in the east and from Tunney's Pasture Station to Moodie Station (Line 1), and to Baseline Station (Line 3).

As part of the 2022-2026 Council Governance Review report, Council approved the following Motion 2022 - 03/06, moved by Councillor Desroches and seconded by Mayor Sutcliffe:

THEREFORE BE IT RESOLVED that City Council establish a Light Rail Sub-Committee of Council to provide oversight over non-operational matters related to the Confederation Line 1 and the construction of Confederation Stage 2 and Trillium Lines.

Based on this motion, Transit Services provides a regular Stage 2 Light Rail Transit Project presentation to Light Rail Sub-Committee (LRSC). The following report provides an update on Regulatory Approvals and Training Requirements for the Trillium Line project followed by an overview of the Stage 2 O-Train East-West construction updates that are provided to Council.

DISCUSSION

This report, and the presentation prepared for the October 27, 2023, Light Rail Sub-Committee (LRSC) meeting, delivers an update on progress of the Trillium Line Extension Project, as well as the O-Train Confederation East and West extensions.

The City of Ottawa has taken significant steps to apply lessons learned from the Stage 1 project and ensure their integration into the planning, procurement, and delivery of the Stage 2 project. Moreover, many of the recommendations stemming from the Ottawa Light Rail Transit (OLRT) Public Inquiry have been embedded in the Stage 2 program and are being implemented as part of the works. The Inquiry recommendations and the City's response to complete the work is outlined in the Action Plan Status Update – Response to OLRT Public Inquiry Recommendations ([ACS2023-TSD-TS-0016](#)).

The City of Ottawa continues to prioritize the implementation of lessons learned as the Stage 2 project progresses. City staff consistently apply the knowledge gained from previous experiences to improve the OLRT1 operations and the development of the Stage 2 project.

As the City progresses with the Stage 2 project, the team remains committed to integrating any further lessons learned into the planning, procurement, and delivery process.

Trillium Line Extension Construction

On the Trillium Line (Line 2), final construction activity, as well as testing and commissioning, is well underway. The Signaling and Train Control System (S&TCS) is being tested daily, with a gradual ramp up of vehicle quantity operating on both the Mainline and Airport Link. The intent is to have nine (9) vehicles operating on the complete Trillium Line at one time in order to replicate service. To date, a total of seven (7) trains have been operating on the line and demonstration of nine (9) train service is scheduled for the week of October 16, 2023.

The construction of all 13 Trillium Line stations continued in Q3 2023, including elevator installation, platform work, utilities work, aluminum composite materials (ACM) panels, shelter installation, painting, glazing installation, communications cable pulling, mechanical, electrical, and plumbing work. Works progressed at the new Albion Yard Facility (formerly called Walkley Maintenance and Storage Facility), including Mechanical, HVAC and Electrical deficiencies closeout.

Trackwork is largely complete with signal testing progressing. Vehicle testing continued between the Walkley MSF and Limebank Station, and the Airport elevated guideways trackwork was provisionally completed. Building Code Services (BCS) occupancy permit inspections and deficiency closeouts for all stations and the MSF are ongoing with full BCS occupancies targeted for end of 2023.

Civil works at Leitrim Station and Bowesville Park and Ride continued in Q3 2023, as well as the installation of permanent fence posts along sections of the guideway. Operational signage installation continues along the guideway.

Hunt Club Bridge remaining works are expected to be completed by end of Q4 2023. Work is progressing at the University Road pedestrian bridge with the installation of steel decking, rebar, and deck concrete pour in progress. The bridge approach work is in progress, as well. All work at these two locations is expected to be completed by Q4 2023.

Stage 2 Trillium Line Regulatory Approvals

The O-Train Line 2 and Line 4 are a federally regulated railway, operated under the name Capital Railway. The City has been actively engaged with Transport Canada and the Canadian Transportation Agency since 2017 in order to obtain the necessary regulatory approvals to permit the resumption of service on the expanded lines, including the Railway Operating Certificate and an amended Certificate of Fitness, respectively. The regulatory approvals work is ongoing but progressing on schedule.

Additional approvals are required on new and updated documentation for updated operating rules, updated track safety rules, updated vehicle inspection rules, as well as a vehicle compliance documentation, and a variety of other secondary supporting documents to show compliance with the various standards and regulations maintained by Transport Canada. Importantly, an updated Safety Management System (SMS) is required prior to the start of operations.

Stage 2 Trillium Line Training Requirements

The training for staff who will operate the system is a critical step in delivering the Trillium Line project. The Stage 2 Trillium Line training and curriculum program is a highly integrated program coordinated between OC Transpo, the Rail Construction Program (RCP) and TransitNEXT. The program consists of a detailed training curriculum to ensure that OC Transpo Instructors, Diesel Rail Operators, Diesel Rail Controllers and TransitNEXT maintenance staff are ready for operations.

TransitNEXT has utilized a train-the-trainer approach in order to support City operations training. In turn, the City's instructors are presently providing training to operators ahead of revenue service, while TransitNEXT is leading the training of controllers. Training is being provided both in-class and on the job. In-class training is largely complete, while the on-job training, which began in summer 2023, is ongoing. Following Substantial Completion, OC Transpo will assume responsibility for operations, safety and maintenance training through internal resources or subcontracts.

Stage 2 Rail Activation Management Program (RAMP) Scorecard Analysis Progress

The Rail Activation Management Program (RAMP) structure and reporting mechanisms ensure a comprehensive tracking and support for all activities and milestones leading up to the public launch of Line 2 and Line 4. Further information can be found in the report presented to Light Rail Sub-Committee on June 19, 2023 – Rail Operational Readiness – Trillium Line ([ACS2023-TSD-RCP-0012](#)).

Regularly scheduled RAMP meetings assemble key stakeholders, including RAMP leads, consultants, Stage 2 contractors, subject-matter experts (SMEs), and support staff. These meetings serve as a platform to exchange updates, coordinate upcoming activities, identify emerging issues, and assign responsibilities for resolution.

Identification of critical activities are essential for a successful public launch. These activities take into consideration services that may have high-impact disruptions, form the basis of the RAMP Scorecard.

A progress summary of critical activities with areas of deviation for the Stage 2 Trillium Line RAMP Scorecard include:

1) Vehicles and Fixed Components

- a. Locomotive Voice and Video Recorder (LVVR): Compliance with a new Transport Canada regulation requires the installation of voice and camera recorders in the operator's cab. The vehicles have been pre-wired to accept the plug-and-play units, however, the delivery from the supplier is still outstanding.

Progress: Installations are ongoing. Based on the new project schedule outlined during the September 29, 2023, Light Rail Sub-Committee meeting, this item is no longer identified as a key issue.

- b. Station Energization: South Keys and Dow's Lake stations continue to require energization. Temporary generators are being mobilized to help mitigate the required two months of testing of electrical systems.

Progress: This issue has been rectified; all stations are now energized. This item is no longer identified as a key issue. The contractor is dealing with residual delays related to electrical and mechanical commissioning of the stations, as well as the commissioning of the elevators.

2) System Installation, Testing and Commissioning

Key elements, including updates to the Transit Operations Control Centre (TOCC), new emergency radio systems, and new cellular coverage in the tunnels, are proceeding as planned and are on schedule. Schedule deviations with signal and train control, and some communication systems, are progressing at a slower pace than initially anticipated.

Progress: TransitNEXT continues to work on system installation and testing and commissioning. Progress on this item continues but remains slow.

3) **Operations and Maintenance Readiness**

Overall, progress is satisfactory across multiple areas, including regulatory approvals, operating plans and procedures, safety and security certification, emergency preparedness, pre-launch coordination, live testing, Trial Run planning, and bus service readiness. Some areas of schedule deviation include:

Areas of schedule deviation include:

- a. Regulatory Approvals: Building Code Services Occupancy Permits and Technical Standards and Safety Authority (TSSA) approvals for elevators are experiencing schedule deviation attributed to the wider system functionality and station readiness delays.

Progress: TransitNEXT continues to work on these items.

- b. Training Program, Staffing and Recruitment, and Maintenance Readiness: These areas are experiencing ongoing challenges due to the slower than anticipated commissioning progress for the signaling and train control system. Impacts on the training program are being assessed and the teams are working closely together to find ways to maximize training hours through the testing period.

Progress: The City and TransitNEXT continue to progress these items.

- c. Maintenance Management Performance Reporting System (MMPRS): In order to support reporting of train and service availability, the maintainer is required to provide a performance reporting system. This system is still incomplete with a delivery date planned for November.

Progress: Delivery of MMPRS is planned for early November.

4) **Customer-Facing Projects**

The Art Program, as well as the bus service and multimodal integration, are on schedule. There are some schedule deviations in the payphone (available for emergency and distress calls) installation and the readiness of some customer-facing systems. These deviations are linked to the previously mentioned challenges.

Progress: The City continues to progress this item.

Project Schedule and Delivery Risks Update

The start of systemwide testing (Bayview Station through to Limebank Station, and South Keys Station through to Airport Station) began in summer 2023. Testing of the communications system, as well as signal and train control system, has progressed, although not at the pace that was originally scheduled. Following the successful completion of the dynamic commissioning of the signal and train control system, training for the diesel rail operators will significantly increase due to the availability of trains. Once the completion of training and various other system readiness prerequisites occurs, Trial Running will commence.

The City will then review and assess an opening date along with the required regulatory approvals. The final date selected will be heavily influenced by the safety, reliability, and general performance of the system. TransitNEXT is focused on delivering the system infrastructure in 2023 and the City has identified a potential public launch timeline of 2024.

Updates to project delivery risk factors that could further delay project works include:

a. Safety and Security Management

A significant safety incident during the remaining construction period, due to the complexity of the operation increasing during testing and commissioning of trains, would result in a significant delay. The rollout of TransitNEXT's Construction Safety Management Plan (CSMP) accompanied with City presence on-site will be used to help prevent the occurrence of a major safety incident during the final stages of project completion.

Furthermore, systemwide testing is used as a final demonstration that the design, construction, and commissioning have been successful; however, this process has the potential to identify a critical safety issue in which case additional project time would be required to resolve the issue. To help mitigate this risk and assess the possibility as early as possible in the project, there has been a progressive ramp-up of testing activities from an individual component level to system integration testing level along with interface control documents to identify and manage the system interfaces.

Update: The City will continue to manage this risk until project completion.

b. Systemwide Testing / Performance

To follow up on safety issues to emerge during testing, the process may identify additional technical, reliability, and/or performance issues that require additional time to resolve. Specifically, the process could identify issues with reliability of a specific vehicle system or infrastructure element.

Update: The City continues to manage this risk until project completion

c. Training Completion

Training of Diesel Rail Operators and Diesel Rail Controllers is a critical final step in bringing the system into service. Delays to infrastructure readiness will delay training and will create a requirement for additional time to prepare for launch. Transit Services has been working diligently on this matter and has been leveraging tools to mitigate this risk including with the use of simulators and participation by staff in the testing process. Timely completion of infrastructure and testing will be the primary driver for mitigation delays to training activities.

Update: The City and TransitNEXT continue to deliver training based on system availability.

d. Regulatory Requirements

Critical to the opening of Trillium Line (Line 2) and Airport Link (Line 4) are the rail regulatory approvals from Transport Canada. There are key risks emerging related to compliance with new regulations and some emerging requirements which are being triggered by issues on Stage 1.

Updated regulations require the installation of Locomotive Voice and Video Recorders (LVVR) on the new and existing vehicles which have not yet been delivered due to manufacturing delays. As noted above, delivery is expected in October.

A new requirement for wayside bearing detection emerged for the project. The original Trillium Line was never equipped with this technology and there is currently significant market pressure for these units given recent freight incidents. An implementation plan and interim agreement on mitigations will be an updated interpretation of operating rules for operators requiring more extensive and active monitoring of vehicles in service. The City is still assessing this requirement and the potential implications of this change as it was not required during the original Trillium Line service nor contemplated as part of procurement.

The City is working closely with Transport Canada and various equipment manufacturers to assess timelines for implementation of these solutions and to assess alternative solutions and mitigation measures.

Update: LVVR for Stadler vehicles are being installed. Delivery of the units for the Alstom vehicles is expected by end of October. Based on revised scheduled timelines the City is managing the remainder of the elements identified in this risk.

e. Construction Completion

Importantly, the City continues to track progress of the works against the overall project schedule. Notwithstanding completion of final commissioning, training, and achievement of regulatory approvals, final completion of construction is required to enable these follow-on activities. Key remaining works include the following:

- Station completions, including commissioning of electrical, mechanical, and communication systems in order to achieve occupancy.
- Major civil works, including Bowesville Park and Ride, Leitrim Park and Ride, Limebank Station bus platforms and road network, Hunt Club Bridge (including a short section of trackwork), and Rideau River Pedestrian Bridge.
- Signal system testing and commissioning.

As part of building on the collaborative and consensus-based approach to project delivery, the City is working with TransitNEXT to identify potential items that are not required for Substantial Completion. Items such as final landscaping, final electrical and mechanical works for the pedestrian bridge linked to future 900 Albert Street, and some roadway works, could potentially be deferred.

Update: Based on the new project schedule outlined during the September 29, 2023, Light Rail Sub-Committee meeting, the quantity of deferred works will be significantly reduced. This will be revisited at handover.

f. The Ottawa Hospital

The proposed New Campus Development (NCD) sites for the Ottawa Hospital are separated by City-owned railway property. The hospital parking garage is proposed to be constructed over part of Line 2. The City and TransitNEXT are coordinating with the Ottawa Hospital design and construction team to ensure any risks the hospital works have induced are appropriately mitigated, avoided, or transferred. More specifically, coordination to prevent any impacts to the construction or operations of Line 2 are underway.

Update: The City continues to engage with the Ottawa Hospital project team to ensure there are no impacts to the project delivery of Line 2 and Line 4.

Confederation Line East Extension

For Confederation Line East, construction of stations, guideway, and overhead catenary systems are ongoing across the network with track construction nearing completion. The majority of the 23-kilometre guideway barrier wall, between the rail guideway and the highway, is complete with some exceptions for station/guideway entrances. The installation of fence on top of the barrier walls is expected to be complete in Q4, 2023.

Overhead Catenary System (OCS) Messenger Wire installation began between west of the Blair Station pocket track area and east of Jeanne d'Arc Station. This work will continue in Q4 2023, as well as the work for the OCS pole installation between Trim Station and Tenth Line.

Mechanical and electrical installation continues at Trim Station alongside the installation of the snowmelt system at the platform level.

Construction of the noise walls on the south side of OR174 is expected to begin shortly while the installation of noise wall panels at Jeanne d'Arc, Convent Glen and Place d'Orléans stations continues.

Confederation Line West Extension

For Confederation Line West, construction of stations, guideway and the cut and cover tunnel continue. A series of detours and the Pinecrest Road westbound off-ramp closure continue to be necessary to enable various construction activities.

Progress is continuing throughout the extension, including interior work for the Bus Operator Buildings (BOBs) at Lincoln Fields and Moodie stations, and structural construction for the station and pedestrian bridge at Queensview Station.

Work continues with the installation of the escalator and elevator at Moodie Station. Testing and commissioning for occupancy for the LMSF buildings is underway.

Work, including drainage, overhead catenary system (OCS) foundation installation, topper slab and drilling for plinth rebar continues in preparation for track between Kichì Sibi and Tunney's Pasture stations. This area is also continuing with rehabilitation work for the existing structures and trench walls.

Excavation, rock breaking and grinding is ongoing from Kichì Sibi Station to east of Rochester Field, while structural work and backfill is ongoing.

FINANCIAL IMPLICATIONS

Delays could have implications on the project's budget. Staff will report to Committee and Council on any adjustments to the contingency budget as and when required.

LEGAL IMPLICATIONS

There are no legal impediments to receiving this report for information.

ACCESSIBILITY IMPACTS

All components of the Stage 2 LRT project adhere to the *Accessibility for Ontarians with Disabilities Act (AODA)*.

Any policy or procedural development, as well as customer communications and public engagement identified in the report's recommendations will include the application of the City's Equity and Inclusion Lens.

Staff will continue to engage persons with disabilities and accessibility stakeholders to ensure that their perspectives are considered and incorporated, and to promote inclusion. Staff will also ensure that any applicable accessibility legislation, standards and guidelines are adhered to during the execution of the projects and initiatives identified in this report.

ASSET MANAGEMENT IMPLICATIONS

The City of Ottawa' Comprehensive Asset Management program uses widely accepted asset management practices and long-range financial planning, in compliance with provincial asset management regulations, to manage the City's infrastructure portfolio worth over \$70 billion to provide for the safe delivery of reliable and affordable services to the community.

Asset management is an internationally recognized and implemented practice that supports informed, transparent decision making, giving Council a framework to provide direction on the appropriate balance of service delivery, cost, and risk, through a process of optimizing the lifecycle management of the City's assets which support the services it delivers.

The implementation of the Comprehensive Asset Management program enables the City to effectively manage existing and new infrastructure to maximize benefits, reduce risk, and provide safe and reliable levels of service to community users. The report identifies potential improvements to the Business Case and Project Management Policy

and Project Management Framework. These are guiding documents to the Comprehensive Asset Management program, and as such, any changes to these core documents will be reviewed and reflected in the program.

RURAL IMPLICATIONS

The City's transportation network, including light rail transit, is designed to provide options for all residents. Once completed, Stage 2 LRT will span from Trim Rd. to Moodie Dr. and south all the way to Riverside South. Rural residents will have access to Park and Ride lots at various stations which will allow them to easily use public transit.

For Line 2 specifically, there will be Park and Ride lots at Bowesville Station, Leitrim Station, and Greenboro Station.

TERM OF COUNCIL PRIORITIES

The 2023-2026 Term of Council Priorities include:

- A city that is more connected with reliable, safe and accessible mobility options.
- A city that it is green and resilient.

DISPOSITION

Transit Services will provide regular updates on Trillium Line testing and trial running. A Quarterly Stage 2 Update will be provided to Light Rail Sub-Committee in Q4 2023