

Subject: Stage 2 Light Rail Transit Project

File Number: ACS-TSD-RCP-0004

Report to Light Rail Sub-Committee on 29 August 2024

Submitted on August 20, 2024 by Renée Amilcar, General Manager, Transit Services Department

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Ward: Citywide

Objet : Phase 2 du projet de train léger sur rail

Numéro de dossier : ACS-TSD-RCP-0004

Rapport présenté au Sous-comité du train léger

Rapport soumis le 29 août 2024

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Quartier : À l'échelle de la ville

REPORT RECOMMENDATION

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

RECOMMANDATION DU RAPPORT

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

EXECUTIVE SUMMARY

This report provides an update on the construction of the City's Stage 2 LRT project. The update includes the O-Train South Extension (Line 2 and Line 4) and O-Train East/West Extension (Line 1 and Line 3).

As the construction for O-Train South Extension comes to a conclusion, this update focuses on the status of the Head-End work, Trial Running and Substantial Completion.

On the O-Train South Extension, headway and vehicle testing with nine trains continues between Bayview, Limebank, and Airport stations. The City is responsible for a number of systems in the Transit Operations Control Centre (TOCC), often referred to as the "Head-End". The City has installed the systems and equipment required at Belfast Maintenance and Storage Facility (MSF), as well as at the TOCC to allow for operation of the line.

Overall, project progress is going well as the City and TransitNEXT move to the trial running. Prerequisites for trial running include obtaining building occupancy permits at all stations, track acceptance, and ensuring the operational reliability of the system. Testing and commissioning activities are advancing, including testing of vehicles, signals, train control systems, and switches.

Both the City and TransitNEXT have worked together, along with oversight and input from the Independent Certifier, to ensure a thorough framework is in place for Substantial Completion that satisfies the requirements of the Project Agreement.

In the east, the installation and testing of the Overhead Catenary System (OCS) has been completed to the end of the eastern alignment, east of Trim Station. The installation of the Wayside Radio Unit (WRU) in the guideway and cable pulling in the cable trough was completed between Jeanne d'Arc, Convent Glen, Place d'Orléans, and Trim stations. Internal work at the Traction Power Substation (TPSS) buildings for all five stations is complete and they have all been energized.

In the west, construction of stations, guideway, track, and the cut and cover tunnel continue in all areas. The Pinecrest Stormwater Management Pond is also nearing completion and will be opened to the public in late summer or early fall. Crews have also begun working on the overhead catenary system at the Light Rail Maintenance Facility which is at the western terminus of the project.

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 O-Train South Extension, including the Airport Link. The Trillium Line will operate from Bayview Station to Limebank Station, and to Airport Station.

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

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 overview of the Stage 2 O-Train construction updates, followed by an overview of the Head-End, which is the communication systems that connect into the Transit Operations Control Centre (TOCC), as well as a lookahead for the South Extension.

DISCUSSION

This report, and the upcoming presentation prepared for the August 29, 2024, Light Rail Sub-Committee (LRSC) meeting, provides an update on the progress of the O-Train South Extension Project, followed by an update on the progress of the O-Train East/West extensions. Additionally, it includes an overview on the communication systems (Head-End) for both extensions, as well as the South Extension lookahead for Trial Running and Substantial Completion.

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 work to improve operations and the development of the Stage 2 project.

1. Trillium Line Extension Construction

On the Trillium Line (Line 2 and 4), final construction activity, as well as final testing and commissioning, is well underway. Headway and vehicle testing with nine trains continues between Bayview, Limebank, and Airport stations.

Work is nearing completion at the new Albion (Walkley) Maintenance and Storage Facility (MSF). Remaining works include, hi-rail equipment crossings, miscellaneous asphalt paving, deficiency closeout in the train wash and inspection buildings, communications device adjustments and testing in the yard.

Concurrently, the closeout of deficiencies on all Trillium Line stations is progressing, elevator adjustments and inspections are completed, cleanup, final glazing installation at the stations, and final communications device commissioning are ongoing.

Ottawa Fire Services (OFS) continued with life safety/fire alarm demonstration and deficiency closeout for all stations. Building Code Services (BCS) occupancy permit inspections and meetings are in progress for all stations and 13 of 13 stations have obtained occupancy permits. Elevator inspections have also been completed and final certificates have been issued.

Civil works at Limebank Station bus loop and at the Leitrim and Bowesville Station Park and Rides continued, including concrete pours and paving. Permanent fence installation along sections of the guideway continued as operational signage installation along the guideway progressed. Track deficiency closeout is also progressing along various sections of the alignment. Bridge work is substantially completed at the University Road pedestrian bridge, which allowed the bridge connecting Vincent Massey Park to Carleton University to open to the public in June 2024. Soft and hard landscaping works continue to take place at all the stations.

1.1. Trillium Line Head-End Update

The City is responsible for a number of systems in the Transit Operations Control Centre or “Head-End”. The City has specified, procured, and installed the systems and

equipment required at the Walkley Maintenance and Storage Facility (MSF), as well as at the Transit Operations Control Centre (TOCC) to allow for operation of the line. The City is responsible for all communication systems required for the O-train South Extension in the TOCC while TransitNEXT is responsible for the signaling, high speed data radio, and tunnel ventilation interfaces in the TOCC.

In order to advance testing of the TOCC and field equipment, the City has built a temporary test lab equipped with all the servers and consoles for O-Train South. This test lab allowed local setup of equipment and configuration well in advance of when it is required for formal integration with TransitNEXT. Further, TransitNEXT created an equivalent field test lab with all the various communication systems field devices. A remote cellular connection between these labs has allowed early integration testing of various systems. This process has enabled both teams to configure, test, and troubleshoot their various services and end devices before the equipment is installed in the field. This early testing activity has been a key initiative to help reduce the risk for the integration of these components.

Since the last report, efforts within the Head-End work have predominately consisted of supporting the field testing for the System Integration Tests. These tests aim to demonstrate end-to-end functionality across multiple systems. As of July 2024, most System Integration tests are complete, and a few remaining deficiencies are being addressed.

1.2. Trillium Line Lookahead - Trial Running and Substantial Completion

As noted earlier in the sections on the Trillium Line Extension construction and head-end updates, overall project progress is going well as we prepare for trial running. Prerequisites for trial running include obtaining building occupancy permits at all stations, track acceptance, and ensuring the operational reliability of the system. The closeout of final trackwork deficiencies is also underway. Testing and commissioning activities are advancing, including testing of vehicles, signals, train control systems, and switches.

Successful trial running is a requirement for Substantial Completion. Other ongoing project requirements for Substantial Completion include acquiring OFS fire life safety approvals, substantially completing park and rides and bus loops, completing signalized intersections critical to operations, and installing Bell payphones at the stations.

Both the City and TransitNEXT have worked together, along with oversight and input from the Independent Certifier, to ensure a thorough framework is in place for Substantial Completion that satisfies the requirements of the Project Agreement. Execution is underway for collection of documentation, tracking of deficiencies (including the resolution

of those that would impede Substantial Completion according to the Project Agreement), and planning for the requirements necessary for the application of Substantial Completion itself.

2. Confederation Line East Extension Construction

In the East, the installation and testing of the Overhead Catenary System (OCS) has been completed up to the end of the eastern alignment, east of Trim Station. The installation of the Wayside Radio Unit (WRU) in the guideway and cable pulling in the cable trough was completed between Jeanne d'Arc, Convent Glen, Place d'Orléans, and Trim stations. Internal work at the TPSS buildings for all five stations is complete and they have all been energized.

Correction of trackwork deficiencies is ongoing. Finishing works at Montréal and Jeanne d'Arc stations are continuing, as are mechanical and electrical works at Convent Glen, Place d'Orléans, and Trim stations. Civil works outside the guideway, including grading, drainage, headwall installation, slope finishing, guardrail installation, and landscaping along OR-174, continued over the spring and summer. Rehabilitation of Jeanne d'Arc Blvd. and the bridge continued, with traffic flipped to the west side of the bridge and rehabilitation work starting on the east side. Noise wall installation on the south side of the highway (B-06) progressed while concrete paving, curb installation, and asphalt paving continued at Trim Park and Ride. Station occupancy for the East stations is progressing well with the major civil construction scopes completed. Life safety testing and commissioning is ongoing at all stations with building occupancy permits expected in Q4 2024.

Train testing in the East started in January 2024, where initial clearance and OCS testing occurred. The segment from Blair Station to east of Montreal Station was handed over to the supplier for communications-based train control (CBTC) testing, which has since progressed to the entire East alignment and will continue until Q2 of 2025.

3. Confederation Line West Extension Construction

For Confederation Line West, construction of stations, guideway, track, and the cut and cover tunnel continue in all areas. The Pinecrest Stormwater Management Pond is also nearing completion and will be opened to the public later this summer. Crews have also begun working on the overhead catenary system at the Light Rail Maintenance Facility which is at the western limit of the project. A series of detours continue to be necessary to enable various construction activities.

Structural work is now complete on the walls and roofs in the Parkway tunnel, as well as in the Connaught and Pinecrest tunnels. With this milestone, progress is now being made to install track, dry fire lines (pipes to suppress fire), and other tunnel fit-outs that will ultimately be required to run the system.

All stations are under construction with structural work mostly complete except at Westboro Station. Interior finishes and testing and commissioning continue at many of the stations as they continue to progress toward completion. The emergency egress tunnel at Bayshore Station is now complete which has allowed the construction of the platform to progress.

At the LMSF, most of the work is complete and project teams are progressing well to achieve building occupancy permits. Track work in the yard is also complete as the project works towards receiving test trains in the yard later this year.

Train delivery of an initial train to the West is planned for September 2024. Two additional trains will be delivered by truck in 2024 to the LMSF and will be reassembled at the LMSF. This will allow for the commencement of tests, including clearance tests, pantograph and OCS tests. This will be followed by CBTC testing starting at the LMSF and gradually progressing eastward over the next several months. Delivering trains by truck to the LMSF allows the testing program in the West to begin, despite tracks along the full alignment not being fully installed. It will be a number of months before tracks are complete in the Parkway tunnel.

Currently, 14 of the 38 vehicles for the Stage 2 fleet have been delivered and accepted by the City. Twelve additional vehicles are at various stages of testing and acceptance. The remaining 12 are in production or have yet to start production.

4. Confederation Line Head-End Overview

A similar approach to testing for Trillium Line Head-End is being used for the Confederation Line. A reproduction of the existing communication system equipment from Stage 1 has been setup using virtual machines to allow testing of the East expansion in a segregated environment. This approach allows interface testing as well as early integration works to be performed while limiting the disruption. The setup of the lab is underway with some key systems such as CCTV and Public Address and Passenger Information System (PAPIS) being setup and initial testing performed for the East Expansion. This integration work will continue in the months ahead.

FINANCIAL IMPLICATIONS

1. Stage 1 and Stage 2 Contingency Funds

The Stage 1 Confederation Line contingency fund is \$115 million. To date, \$101.5 million from the total fund has been spent. Remaining funds are primarily related to property requirements and remaining commercial matters.

The original Stage 2 contingency fund of approximately \$152 million was increased by \$25 million (approved by Council July 06, 2022) and an additional \$110 million (approved by Council November 22, 2023) due to unforeseen costs and improvements to the project. Approximately \$238 million of the Stage 2 contingency fund has been committed to date. As per the last funding report, a residual budget pressure is forecasted for City and other costs however that pressure will be addressed at a future date.

2. Stage 1 and Stage 2 Capital Budgets

In keeping with Council's approved 2017 Stage 2 Report ([ACS2017-TSD-OTP-0001](#)), 2019 Stage 2 Report ([ACS2019-TSD-OTP-0001](#)), 2022 Stage 2 Report ([ACS2022-FSD-FIN-0009](#)) and 2023 Stage 2 Report ([ACS2023-TSD-RCP-0017](#)), approximately \$3.829 billion has been spent as of July 31, 2024, and relates to the RTG MOU for Belfast Yard and vehicle assembly mobilization (\$447 million), Confederation Line extension mobilization and construction period payments (\$2.167 billion), Trillium Line extension construction period payments and financial close for the Revenue Vehicle Supply Contract (\$634 million), and contingency (\$116 million). The remaining \$465 million was spent on planning, procurement, project delivery and City retained scope.

July 31, 2024				
Project Description	Authority	Actual Expenditures	Funds Reserved/Committed	Unspent/ Uncommitted
Stage 1				
Confederation Line Program	2,130,000,000	2,130,000,000	-	-
Contingency	115,000,000	101,539,162	13,460,838	-
Total Stage 1	2,245,000,000	2,231,539,162	13,460,838	-
Stage 2				
Confederation Line Extensions DBF Contract	2,680,832,113	2,166,577,627	514,254,486	-
Trillium Line Extension DBFM Contract	850,966,493	633,832,631	78,611,872	-
Deferred Equity (Maintenance Term)	-	-	138,521,990	-
RTG Stage 2 MOU (includes 38 Alstom vehicles)	516,184,423	447,357,647	68,826,776	-
City Costs (includes planning, procurement, property acquisitions, City retained scope, and delivery oversight)	574,629,108	465,189,524	41,001,172	68,438,413
Contingency	287,640,000	116,118,063	122,313,084	49,208,854
Total Stage 2	4,910,252,137	3,829,075,491	963,529,380	117,647,266

Delays could have implications on the project's budget. Staff will report to Committee and Council on any adjustments to the contingency budget, as 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 O-Train South 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 ongoing information to Light Rail Sub-Committee, Transit Commission and Council as Trial Running is completed and Handover of O-Train South (Line 2 and Line 4) is finalized. The information provided to Council will include:

- Daily updates throughout Trial Running.
- A technical report provided to Council before O-Train South is handed over to the City of Ottawa.