



MEMO / NOTE DE SERVICE

To / Destinataire	Mayor and Members of Council	File/N° de fichier:
From / Expéditeur	Director, Rail Construction Program Transportation Services Department	
Subject / Objet	O-Train Light Rail Transit Stage 1 and Stage 2 Quarterly Update (Q4 2020)	Date: March 1, 2021

The following memorandum outlines the milestones achieved on the O-Train Stage 1 Confederation Line and Stage 2 Confederation Line and Trillium Line extension projects in Q4 2020 and provides an overview of the planned work for Q1 2021.

The City of Ottawa continues to closely monitor the COVID-19 pandemic in relation to both the maintenance and operation of the Stage 1 Confederation Line and the delivery of the Stage 2 Project. The various maintenance, design, and construction teams working on light rail in Ottawa are adhering to all guidance provided by Ottawa Public Health and the Province of Ontario.

In addition to monitoring the local construction impacts, staff are working with Rideau Transit Group to monitor potential impacts on the Alstom manufacturing facility in Brampton, Ontario and are working with TransitNEXT to monitor potential impacts on the Stadler manufacturing facility in Bussnang, Switzerland. At present, vehicle deliveries from the Brampton facility are continuing and the initial vehicle deliveries from Switzerland are expected to begin this year.

Construction continues in all geographic areas of the project and the City is monitoring the potential impacts on the projects closely. The City is working closely with the contractors to understand if there will be any impacts to these projects as a result of the COVID-19 environment locally and abroad.

The Trillium Line team has indicated schedule impacts which are now under review. The City is working with TransitNEXT to confirm whether the delays will be fully realized and to confirm if the delays can be reasonably mitigated. The handover of the system is still scheduled for 2022.

The Confederation Line team has reported some schedule pressures, and these have since been resolved. Following an assessment of the schedule and of schedule mitigation opportunities, the original handover timeline of 2024 in the east and 2025 in the west remain as planned.

Stage 1 Confederation Line

The critical focus on the Stage 1 Confederation Line remains the implementation of Rideau Transit Group's (RTG) rectification plan in order to improve the performance of the system. As of Q4 2020, much of the rectification work has been completed and the ongoing third-party independent review will inform the City's understanding as to whether the rectification works are improving the Line 1 service. As presented at Transit Commission in December 2020, the following progress has been made on the RTG rectification works:

- **Vehicle Brakes:** Alstom is currently working on a software update to the vehicle brakes. RTG will continue to investigate other fine tuning of vehicles systems and/or software to improve the performance of the light rail vehicles.
- **Overhead Catenary System (OCS):** The corrective work on the OCS is now largely complete. As with all rail systems, there will always been ongoing adjustments needed to the OCS as part of regular maintenance activities.
- **Switch Heaters:** The switch heater work to upgrade the switch heaters to gas powered units in the eastern segment of the Line 1 alignment is now complete. Significant testing and commissioning of the new gas-powered switch heaters was undertaken to validate the functioning of the heaters.
- **Traction Power:** RTG reports that replacement of vehicle inductors has been completed.
- **Vehicle Doors:** RTG previously installed updated door software, which has improved the overall operation of the vehicle doors. Additionally, RTG focused on updating door hardware to allow the rail operators to fix door issues more efficiently. This work has been completed.
- **Auxiliary Power System (APS):** Work on the APS continues, including a recent software update across the fleet. RTG continues to monitor the update to ensure the desired performance results continue to be achieved.
- **Vehicle HVAC:** Improvements to the vehicle HVAC system are effectively complete. Alstom will continue to monitor, fine tune and make seasonal adjustments to the vehicle cabin HVAC system to improve the temperature and comfort for operators and to to ensure the desired performance results are achieved.
- **Wheel Cracks:** RTG and Alstom continued the daily inspection regime of the wheels and replacement of wheels on all vehicles across the fleet throughout Q4 2020. As of the end of the quarter, wheels have been replaced on 16 vehicles. The Transportation Safety Board (TSB) investigation is ongoing; however, TSB did release their preliminary findings which was shared with City Council on December 15, 2020.

In addition to the work on rectification, ongoing maintenance activities, like on all rail systems, will continue throughout the maintenance period, including routine maintenance to track, OCS and vehicles. Finally, there are ongoing activities related to project close-out, including minor deficiency work, final reporting to the funding partners and close-out of project documentation. Stage 1 Confederation Line project close-out activities continued in Q4 2020 and will continue.

Stage 2 Project Update

Design Progress

In Q4 2020, design work progressed for the Stage 2 Trillium Line and Confederation Line project teams, TransitNEXT and East-West Connectors (EWC).

Trillium Line South Extension Design

In Q4 2020, City staff reviewed TransitNEXT's final design drawings for Limebank and South Keys stations, final communication systems design drawings for Airport Station and pre-final communication systems design drawings for Bayview Station. City staff also reviewed the final design drawings for utility relocations along the existing portion of the alignment and a re-submission of the pre-final operational modelling for the mainline and the New Walkley Yard Maintenance and Storage Facility (MSF).

City staff completed the review of the construction document submission for the combined rail and multi-use pathway (MUP) bridge over Hunt Club Road as well as construction document submissions for landscaping along the guideway for the portion of the existing Trillium Line and the new Airport Link. City staff also reviewed the final design documents for the Stadler vehicles and the construction document submission for the Dow's Lake Tunnel. Lastly, City staff received Issued-for-Construction drawings for various structures throughout the alignment, including rail bridges over Limebank Road and Airport Parkway, and Issued-for-Construction drawings of the guideway for the Airport Link.

In Q1 2021, City staff will complete the review of final design drawings for the New Walkley Yard MSF and 10 stations (Bayview, Gladstone, Carling, Carleton, Walkley, Greenboro, South Keys, Leitrim, Bowesville, and Uplands). Following this review, the final design review, at a minimum, will be completed for all 13 stations. City staff are also in the process of reviewing the construction document submissions for the signaling and train control system, guideway drawings for the south extension and landscape drawings for the south extension alignment.

City staff will also review the final communication systems designs for South Keys and Uplands Stations and expect to review the final communications systems designs for the remaining 10 stations later in Q1 2021. The City is also expecting to receive final design drawings for operational, or non-station, signage submissions for the full alignment in Q1 2021 as well as pre-final design submissions for the existing Alstom LINT vehicles.

Confederation Line East and West Extensions Design

In Q4 2020, City staff reviewed EWC's designs of specific Confederation Line extension elements, including stations, trackwork, utility expansion works, bridge structures, Highway 417 interchanges, and roadway works including the Highway 174 and the Sir John A. Macdonald

Parkway (SJAM). The designs for additional stations are expected to be completed or near completion in Q1 2021, including Jeanne d'Arc, Baseline, Place d'Orleans, Trim and Montreal Stations. Issued-for-Construction drawings have been issued for several portions of the project, including the Sir John A. Macdonald Parkway, portions of the Parkway tunnel, several bridge structures, Moodie Light MSF, and several utilities. Construction is underway for these items.

In Q1 2021, staff will continue the review of design documents for stations, roads, bridges, track, guideway and utility work throughout the east and west Confederation Line alignments.

Construction Progress

Construction continues to progress throughout both Stage 2 alignments by East-West Connectors (EWC) and TransitNEXT.

Trillium Line South Extension Construction

In Q4 2020, works continued along the existing Line 2 Trillium Line alignment, including sump and elevator pit excavations and fibre optic utility relocation work. The Dow's Lake Tunnel expansion joint and waterproofing work commenced and the south MUP underpass widening at Carleton Station was completed. Excavation work for the MUP underpass and future proofing for Carleton tunnel connections is underway at Carleton Station. Station work started, including foundation and platform structural work at Mooney's Bay Station and preparatory works for Walkley Station. The substructure work for the grade separation over the VIA tracks at Ellwood diamond is progressing. Further to the north, sump pit excavation and dewatering continued at Gladstone Station, and caisson work began in preparation for the construction of the Bayview Station pedestrian bridge.

At the New Walkley Yard MSF, glazing, roofing, and insulation work commenced in Q4 2020. Installation of underground conduit and ductbanks both inside and outside of the building was completed, and railroad ties were delivered and are currently stored in the old MSF yard.

In Q4 2020, structures along the South Extension alignment between South Keys and Limebank stations continued to advance. Substructure work is underway at the Hunt Club overpass, and the Airport Parkway, Uplands, Lester, Earl Armstrong and Bowesville station overpasses are approaching substantial completion. Leitrim, Limebank and the Airport elevated guideway substructures continued to advance in Q4, as well as girder and deck work on the Airport elevated guideway.

Station work at South Keys advanced with foundation and structural work ongoing, Bowesville Station pile foundation work was completed, and Limebank Station utility work commenced. Finally, in Q4 2020, station foundation work began at Uplands Station on the Airport Link.

In Q1 2021, trackside cable and conduit tray installation will progress and the construction of structural retaining walls at Earl Armstrong will continue. Rock removal to widen the guideway trench between Carling and Gladstone stations, required to extend the double track in this area, will begin. Structures are expected to advance, including girder installation on the Leitrim Station overpass and the installation of caissons and columns for the Hunt Club overpass. Station construction at all locations is expected to either commence or advance, and finally, the delivery of special trackwork and additional head-hardened rail is expected to arrive in Ottawa.

Confederation Line East and West Extensions Construction

On the west alignment, the construction of the new Goldenrod Bridge is underway, with work anticipated to be completed in late Q2 2021. This bridge will enable the removal of the Transitway embankment road just west of Tunney's Pasture Station in the Transitway rock cut. This work will enable the westerly extension of track from Tunney's Pasture.

The site preparations continued at Rochester Fields and south of the SJAM Parkway for the start of Parkway Tunnel construction, including storm sewer installation, slurry plant and laydown area. The installation of guide walls to support the excavation of the tunnel started in Q4 2020. The utility work and excavation in preparation for the tunnel near Connaught Park and Queensview Station is underway and expected to continue through Q1 2021.

Work along Richmond and Byron avenues in preparation for the Parkway Tunnel also continued through Q4. Work included storm sewer and watermain construction, and utility relocations. The installation of the support of excavation has started near New Orchard Station and west of Woodroffe Avenue. The installation of structures to support the excavation is expected to continue through Q1 2021.

The construction of a storm sewer and watermain in proximity to Lincoln Fields Station near Carling Avenue is ongoing and is anticipated to be completed in Q1 2021. Modifications to Carling Avenue are ongoing and are required to facilitate the watermain relocation and storm sewer connection. Construction of the temporary Lincoln Fields bus loop was completed in Q4 2020, permitting the start of the excavation of the station with construction of the station expected to begin in Q2 2021.

Further in the west, construction of the permanent and temporary section of the new Iris Street culvert to the north of the original road alignment is complete (phase 1). Iris Street has been detoured to the north on top of the recently constructed culvert to make room to complete the southern part of the new Iris Street culvert (phase 2). The new culvert is required to accommodate the realigned Pinecrest Creek, expected in Q3 2021. The realignment of the creek is required in advance of construction of the Iris Street bridge (Q3 2021) and Iris Station (Q2 2022).

The construction of the bus loop at Baseline Station was completed in Q4 2020. Installation of support of excavation for the south Baseline Station began in Q4 2020 and will continue through Q1 2021. Station bus operator building construction is expected to start in Q2 2021.

Preliminary modification to the Highway 417 Pinecrest interchange ramps was completed in Q4 2020. The construction of the new Pinecrest Road Bridge continues and the preparation for retaining wall construction is underway on the west side of Pinecrest Road. A bridge structure that will carry Pinecrest Road over the future LRT trench is being built on the eastern infields and will be pushed into place over an extended weekend when it is ready. Construction of the LRT trench under the ramps in this area as well as a multitude of major wet utility works that are required will necessitate a variety of ramp adjustments and some temporary ramp closures.

A new bridge at Holly Acres Road is also underway. This work requires some utility relocation and intersection modification to accommodate construction of a center pier for a new bridge, which is expected to continue in Q1 2021.

Finally, the construction of the detoured lanes at Moodie Drive was completed in Q4 2020 to accommodate construction of the east side of the new Moodie Drive Bridge which is ongoing. Work is underway at the Moodie LMSF, including utility work and construction of a structure to accommodate the crossing of Stillwater Creek. Construction of the LRT trench under the ramps in this area will require a variety of ramp adjustments and some temporary ramp closures.

In the east, the reconfiguration of Ottawa Regional (OR) 174 is ongoing. Construction of new bridges over Montreal Road were opened to traffic in Q4 2020, and the existing bridges were demolished to make room for construction of the station bridge anticipated to begin in Q1 2021. Staging of the OR 174 lanes near Blair Road was completed to accommodate the construction of a new bridge. Drainage works, including storm sewer and culvert extensions, are ongoing on the north and south side of OR 174 near Orleans Blvd and Place d'Orléans Station, in preparation for the realigned OR 174 lanes. Finally, the construction of drainage work and new parking lots at the Trim Park and Ride started in Q2 2020 and is ongoing. The construction of a new Trim Road intersection started in Q4 2020 and is ongoing.

Modification to the various OR 174 ramps will allow future guideway work to begin in the center median area of OR 174, away from active traffic lanes. All traffic will be maintained in both directions throughout the duration of the project, however, minor off-peak delays to eastbound traffic may occur at times.

Stage 2 Vehicles

As part of the Stage 2 Project, TransitNEXT will supply seven Stadler FLIRT vehicles. These vehicles are being designed and manufactured in Switzerland. The design period is now complete, and manufacturing has begun. The car shells for the first vehicles were completed and painted following their successful First Article Inspection (FAI). The car shells for the second

vehicle are currently being manufactured with one of the cars having already completed its FAI. Delivery of Stadler vehicles is expected to begin in 2021.

Rideau Transit Group (RTG) is providing 38 additional Alstom Citadis Spirit light rail vehicles to ensure that the expanded Stage 2 Confederation Line operates as a single, uniform service. The Rail Construction Program is monitoring the production of this expanded fleet with special attention being placed on ensuring that all hardware and software improvements and upgrades resulting from the in-service experience of the Stage 1 fleet are applied to the new vehicles.

Despite supply chain impacts related to the COVID-19 pandemic, RTG continues vehicle assembly in Brampton and shipment to Ottawa for reassembly and final testing. Additional vehicles are anticipated to be available in the coming months.

Stage 1 Maintenance Payments

Further to the payments provided in previous updates, the City has made payments for the invoice periods of August 2020 to November 2020, reflecting the system performance of July to October 2020, less deductions, as required by the Project Agreement.

The City continues to work through an invoice review to ensure that we meet all of our contractual obligations under the Project Agreement. Invoices under review include the period for October 2019 to January 2020, reflecting system performance from September 2019 to December 2019 and February 2020 to April 2020, reflecting system performance of January 2020 to March 2020.

Stage 1 and Stage 2 Capital Budgets

The Stage 1 Confederation Line Contingency Fund is \$100M. To date, \$90.6M from the total fund has been spent. Remaining funds are earmarked for potential future changes, primarily related to property requirements and transit priorities. When funds are reserved for contract variations, the upper cost limit for the variation is used and upon completion of the work, unspent monies are returned to the Contingency Fund. For this reason, the funds reserved figure is an estimate that may be higher than the actual amount spent. There is unplanned revenue to address the (\$3,994,085) Unspent/Uncommitted balance within the Contingency.

In keeping with Council's approved 2017 Stage 2 Report (ACS2017- TSD-OTP-0001) and 2019 Stage 2 Report (ACS2019-TSD-OTP-0001), approximately \$1.374B has been spent as of December 31, 2020 and relates to the RTG MOU for Belfast Yard and vehicle assembly mobilization (\$355.1M), Confederation Line extension mobilization and construction period payments (\$578.8M) and Trillium Line extension construction period payments and financial close for the Revenue Vehicle Supply Contract (\$183.9M). The remaining \$256.2M was spent for planning, procurement, project delivery and City retained scope.

December 31, 2020				
Project Description	Authority	Actual Expenditures	Funds Reserved/Committed	Unspent/Uncommitted
Stage 1				
Confederation Line Program (DBFM Contract & City Costs)	2,130,000,000	2,129,575,162	424,838	-
LRT Highway 417 Widening	224,500,000	224,396,660	-	103,340
Contingency	100,000,000	90,643,380	13,350,705	(3,994,085)
Total Stage 1	2,454,500,000	2,444,615,202	13,775,543	(3,890,745)
Stage 2				
Confederation Line Extensions DBF Contract	2,680,832,113	578,819,109	2,102,013,004	-
Trillium Line Extension DBFM Contract	810,159,585	183,903,205	487,734,390	-
Deferred Equity (Maintenance Term Repayment)	-	-	138,521,990	-
RTG Stage 2 MOU (includes 38 Alstom vehicles)	516,184,423	355,124,616	160,619,637	440,170
City Costs (includes project planning, procurement, property acquisitions, City retained scope, and delivery oversight)	497,629,108	256,244,016	50,258,942	191,126,150
Contingency	152,640,000	237,322	36,224,652	116,178,026
Total Stage 2	4,657,445,229	1,374,328,268	2,975,372,614	307,744,347

Communications and Stakeholder Relations

Following a milestone event held on September 25th on the West Extension, two milestone events were held in December 2020 to celebrate the progress on both the east and south extensions. On December 4, 2020 Mayor Jim Watson was joined by MP Marie-France Lalonde, representing the Government of Canada, MPP Jeremy Roberts from the Government of Ontario, and members of City Council to celebrate the demolition of the old Montreal Road interchange bridges to make way for the future Montreal Station and track. Residents interested in more information can visit ottawa.ca/stage2 and watch this [video](#).

On December 11, 2020, Mayor Jim Watson joined MP Chandra Arya, representing the Government of Canada, and the Honourable Lisa MacLeod, from the Government of Ontario, to start laying track at the New Walkley Yard MSF, a key component of the Stage 2 LRT O-Train South extension. Residents looking for more details can visit ottawa.ca/stage2.

In 2020, the Stage 2 stakeholder relations and communications team issued:

- 140 public notices;
- 100+ e-newsletters;
- 11 web articles; and,
- 6 educational videos.

Planning activities are underway to host digital open houses for each extension in spring 2021.

The Rail Construction Program continues to encourage residents to subscribe to the Stage 2 LRT newsletter to receive monthly progress updates, construction photos and video and area specific notifications regarding upcoming works. Residents can subscribe to the electronic newsletters by visiting ottawa.ca/stage2 or by emailing stage2@ottawa.ca.

Should you have any questions about the information provided in this memo, please do not hesitate to contact me at extension 52718.

*Original signed by
Michael Morgan*

c.c. Senior Leadership Team
Transportation Services Departmental Leadership Team
Director, Public Information and Media Relations