



MEMO / NOTE DE SERVICE

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From / Expéditeur Michael Morgan
Director, Rail Construction Program
Transportation Services Department

Subject / Objet O-Train Light Rail Transit Stage 1 and Stage 2 Date: March 4, 2022
Quarterly Update (Q3 and Q4 2021)

The following memorandum outlines the milestones achieved on the O-Train Stage 1 Confederation Line, Stage 2 Confederation Line and Trillium Line extension projects during both Q3 and Q4 2021 and provides an overview of the planned work for Q1 2022.

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. The team is continuing to monitor impacts on the overall Stage 2 program and will advise on further impacts as they arise.

In addition to monitoring the local construction impacts, staff continue to work with Rideau Transit Group (RTG) to monitor potential impacts on the Alstom manufacturing facility in Brampton, Ontario and with TransitNEXT to monitor potential impacts on the Stadler manufacturing facility in Bussnang, Switzerland. Notably, the first four vehicles from Stadler have been delivered to the Ottawa area as of the end of January 2022.

Stage 1 Confederation Line

On September 24, 2021, the City of Ottawa issued a new Notice of Default to RTG as a result of the August 8 and September 19, 2021 derailments. This new Notice of Default is in addition to the Notice of Default issued to RTG on March 10, 2020. RTG remains in a state of increased monitoring. The third-party independent review being undertaken by Mott MacDonald remains underway and ongoing.

As part of the requirements to resume operations, RTG provided a return to service plan to the City on October 15, 2021. RTG's plan was conditional on the completion of an intensive inspection program of the vehicle fleet and was reviewed and validated by the City's independent rail safety expert Transportation Resource Associates (TRA) Inc. On November 10, 2021, TRA Inc. provided written confirmation to the City that Line 1 could be safely returned to partial revenue

service. Based on TRA's determination and recommendation, the City accepted that all requirements of due diligence had been satisfied and partial service resumed on O-Train Line 1 on November 12.

Concurrently, RTG and Alstom continued replacement of wheels on Line 1 vehicles across the fleet throughout Q3 and Q4 2021. Since resuming revenue service on November 12, 2021, only vehicles that have had the full wheel replacements have entered service. The Transportation Safety Board (TSB) of Canada investigation continues, and all required parties are engaged, including the Chief Safety Officer and the Rail Monitoring and Compliance Officer (RMCO).

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 will continue in 2022.

Stage 2 Project Update

On December 17, 2021 the Finance and Economic Development Committee was advised that TransitNEXT has informed the City of a delay to the original Trillium Line extension schedule with testing with first and second vehicles scheduled for Q1 2022 and full line testing by end of Q4 2022. Substantial Completion and handover to the City is scheduled to occur in 2023. The City will continue to closely monitor the Trillium Line schedule and provide updates as further progress is made with works in the field.

The City is working closely with East West Connectors (EWC) to maintain the Confederation Line extension schedule. As discussed at the December 17, 2021 Finance and Economic Development Committee, the project is still on the original timelines in the east but there are schedule pressures on the western segment. A workshop with City staff and EWC is planned for Q1 2022 to review and assess opportunities to mitigate schedule impacts.

Design Progress

During the Q3 and Q4 2021, design work progressed on both the Stage 2 Trillium Line and Confederation Line extensions by the project teams, TransitNEXT and EWC.

Trillium Line South Extension Design

In Q3 and Q4 2021, staff reviewed the issued-for-construction (IFC) drawings for most Trillium Line Stations, station signage, wayfinding, and communications systems, the Dow's Lake Tunnel and Pumphouse, and the Walkley Yard Maintenance and Storage Facility (MSF). Staff also reviewed IFC drawings for the Hunt Club Rail Bridge and the final design submissions for the operational modelling of the system, communication systems design for the Walkley Yard MSF and the retrofit of the existing Alstom LINT vehicles.

Additionally, staff reviewed the construction document (CD) submissions for utility relocations on the existing Trillium Line, communications systems, and interface control documents.

In Q1 2022, staff will continue to review CD submissions for common elements submissions for architecture, wayfinding and signage and landscaping that are applicable to all stations and guideways, and any revisions made to IFC and CD designs made as a result of staff review comments.

Confederation Line East and West Extensions Design

In Q3 and Q4 2021, City staff continued their review of EWC's designs of specific Confederation Line extension elements, including stations, trackwork, utility expansion works, bridge structures, systems design packages and Highway 417 interchanges. The design submissions for all stations for Confederation Line East in addition to Algonquin and Lincoln Fields stations for Confederation Line West have reached the IFC stage. The remaining stations are expected to reach IFC in Q1 of 2022.

Most systems design packages have also reached IFC during Q3 and Q4 2021. Previously, IFC designs have been issued for several other portions of the project, including the SJAM, portions of the Parkway tunnel, several bridge structures, Moodie Light MSF, and utilities works. All highway works packages have also reached the IFC stage and final encroachment permits from Ministry of Transportation Ontario are being obtained. Currently, all design packages have been reviewed at the final design stage and are moving through the design process. Overall, the design of the Stage 2 Confederation Line extensions is expected to be completed by Q2 of 2022.

In Q1 2022, 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. The review of other works that will be completed following substantial completion, including the Richmond Road Complete Street and the decommissioning of portions of the Transitway, will continue in 2022. The City also initiated a variation to have the contractor design and build noise mitigations in the western guideway segments between Richmond Road, Lincoln Fields, and Connaught Park. This new work is in addition to planned work by the City to add noise mitigations between Tunney's Pasture and Dominion Station. The City had previously initiated a variation to extend the planned noise walls along the OR174 to capture additional areas that were not included in the Project Agreement base scope.

Construction Progress

Construction progressed throughout both Stage 2 alignments by TransitNEXT and EWC during Q3 and Q4 2021.

Trillium Line South Extension Construction

In Q3 and Q4 2021, the construction of all Trillium Line stations continued, including pile caps, formwork, rebar installation and concreting for grade beams at Bayview Station, and the construction of vertical walls, underground electrical and mechanical duct banks and storm pipes at Corso Italia Station. At Dow's Lake Station, slope stabilization, formwork, rebar and concreting for the elevator pit were completed, with structural steel work for the elevator pit and platform construction ongoing in Q1 2022. Additionally, the excavation for foundation work, formwork, rebar installation and concreting for the west platform slab was completed at Carleton Station. Duct banks and intertrack barrier walls construction and below grade services at Carleton Station progressed in Q4 2021, and it is expected to continue in Q1 2022. At Mooney's Bay Station, formwork, rebar and concreting for the platform slab was completed, and the construction of watermain and storm sewer services to the station started and will continue through Q1 2022. At Walkley Station, rebar and concreting for a portion of the platform slab and structural steel installation was also completed. The installation of station mechanical, electrical, and plumbing conduits is in progress and will continue into Q1 2022.

Further south on the mainline, Greenboro Station is advancing with the completion of platform slab concrete and formwork, with mechanical, electrical, and plumbing rough-ins and duct banks and emergency stairs construction ongoing. At South Keys Station, mechanical, electrical, and plumbing rough-ins are ongoing, construction of concrete masonry unit walls at the concourse level is in progress and expected to continue in the next quarter. Structural steel installation is expected to start in Q1 2022. At Leirim Station, the bus operator building foundation walls and formwork, rebar and concrete for the station walls are completed. Structural steel installation has started and is expected to be completed in Q1 2022. The elevators units were delivered and installed, and mechanical, electrical, and plumbing rough-ins and electrical duct banks construction are expected to continue into Q1 2022. Bowesville Station north and south stair walls formwork, rebar and concrete were completed, while underground mechanical, electrical, and plumbing installation at the bus operator building is ongoing. At Limebank Station, formwork, rebar and concrete for the station platform was completed, while concrete masonry unit walls for the operator building are in progress and structural steel installation is expected to be completed in Q1 2022.

On the future Airport Link, Uplands Station is advancing well with delivery and installation of the elevators, and structural walls and structural steel installation, while concrete masonry unit walls, watermain and sanitary line connection works are expected to continue into Q1 2022. Finally, at Airport Station, the roofing installation for the emergency stairs is complete. Retaining wall construction, concrete repairs on the emergency stairs tower and conduit installation works are ongoing and will continue in Q1 2022.

At the Walkley Yard MSF, the installation of the overhead doors and the wheel lathe was completed in 2021, while the overhead cranes, HVAC system, electrical panels, gas lines and drywall in the administrative office areas are in progress and are expected to continue into Q1

2022. The installation of tracks in the maintenance pit is complete. Formwork, reinforcement, and concrete placement for the train wash and inspection building footings and foundation walls are also completed. Structural steel installation for the train wash building was completed, and structural steel for the inspection building is expected to continue in Q1 2022.

Trackwork in the MSF yard is in progress and the test track work installation between the MSF yard and Leitrim bridge is nearing completion. Trackwork along other segments of the alignment is expected to continue through Q1 2022.

The construction of numerous structures throughout the Trillium Line alignment also continued to approach completion in Q3 and Q4 2021. Superstructure works continue on the Limebank Road rail bridge, with concrete poured for all four spans of deck and parapet walls completed. MSE walls construction are in progress and expected to continue into the next quarter. All girders were delivered and installed on the Hunt Club rail bridge and Ellwood elevated guideway bridges. Additionally, bridge foundation works for the new Rideau River Pedestrian Bridge is nearing completion and superstructure works is expected to continue through Q1 2022. Remedial works at the existing Rideau River rail bridge is ongoing. Construction is in progress for the Airport elevated guideway plinths and is expected to continue through Q1 2022.

Finally, special trackwork, cable troughs installation and fencing along the alignment is in progress and is expected to continue through Q1 2022. Fiber optic relocations are continuing along different sections of the alignment to facilitate guideway construction.

Confederation Line East and West Extensions Construction

On the Confederation Line east extension, the Blair flyover bridge work continued in Q3 and Q4 2021, including the pouring of the bridge deck, diaphragms, parapets, west abutment approach MSE walls and dry finishing of the structure. The foundation and superstructure work for the Montréal Station bridge was completed, precast deck panels were installed, and deck, east and west side slab moment, sleeper, and approach slabs pours were completed. The construction of the highway bridges at the Montreal Interchange continued, including the pouring of the bridge decks, parapets approach slabs and the expansion joints. The plinth pours for the Blair flyover bridge and Montreal Station bridge are expected to begin in Q1 2022. Waterproofing of the Blair flyover bridge and Montreal interchange bridges is also expected to begin in Q1 2022.

Drainage works, including storm sewer and culvert extensions on the north and south side of OR 174 between Montreal Road and Trim Road was completed. Storm and sanitary sewer relocation work at the future Convent Glen Station site was also completed. Drainage, utility work and new parking lots at the Trim Park and Ride continued in Q3 and Q4 2021, and the new Trim Road intersection was completed and was put into service in Q3 2021. OR174 widening work, to make room in the median for the future guideway, was completed in Q4 2021. Noise walls installation on the north side of OR174 continued and are expected to be completed in Q1 2022.

Guideway excavation, drainage, embankment, overhead catenary system foundations and sub-ballast work between the Blair flyover bridge and Tenth Line Road continued in Q3 and Q4 and are expected to continue throughout Q1 2022. Guideway barrier walls between the future guideway and the OR174 lanes continued in Q3 and Q4 2021 and work will resume in Q2 2022. Approximately 9km out of 23km of guideway barrier walls has been completed to-date.

Rail has been delivered and is stockpiled east of the OR174 Montreal Road interchange and Champlain Street. Welding of the rail to create rail strings was completed in Q4 2021. Initial ballast placement began between the Blair Flyover Bridge and Jeanne D'Arc station in Q4 and will continue in Q1 2022. A 250m track section was installed west of Jeanne D'Arc station, and track installation work between east of the Blair Flyover bridge and Jeanne D'Arc will begin in Q2 2022.

Foundation works at Jeanne D'Arc Station continued in Q3 and Q4 2021. Sump pit and mechanical, electrical, and plumbing work progressed and will continue in Q1 2022. Raft slabs, foundation walls, and platform slabs were poured and will continue in Q1 2022. The east portion of the Convent Glen Station site, Place d'Orleans Station, and Montreal Station on the south side of Montreal Road, and Trim Station were handed over to the station sub-contractor to begin foundation works in Q1 2022.

On the Confederation Line west extension, construction has progressed on the Goldenrod Bridge and a plan has been developed to accommodate the transitway detour prior to the commissioning of the bridge. The detour will transition buses off the Transitway and onto Scott Street from the SJAM to Tunney's Pasture to allow station and guideway work along the transitway to begin. To facilitate the transition, a temporary bus bridge was completed in Q4 2021 between Roosevelt Avenue and Workman Avenue that will carry detoured buses over the existing transitway. Curbs, paving, temporary bus stops, signals and widening work along Scott Street also occurred in Q4 2021. Roadway, sidewalk, MUP and cycle track related works will continue in Q1 2022 in anticipation of the transitway detour scheduled to begin in April 2022.

Along the SJAM, the construction of the slurry wall was completed. Work also began on the relocation of a large diameter watermain to facilitate the construction of the tunnel. The watermain will pass above the tunnel and the relocation is expected to be completed in Q2 2022.

Roadway work on Richmond Road and Bryon Avenue, and shoring and excavation of the Parkway Tunnel continued through Q3 and Q4 2021. The tunnel is being excavated to an approximate depth of 10.5 metres and will continue throughout 2022 and 2023. The excavation for Sherbourne Station was completed in Q3 2021. Concrete placement, waterproofing and wall work at New Orchard and Sherbourne stations will continue in Q1 2022.

Construction continued at Lincoln Fields Station and Carling Avenue. At the station, concrete placement occurred at the platforms and concourse levels and the erection of structural steel will be on-going in Q1 2022. On Carling Avenue, traffic lanes were shifted to enable the advancement of the second phase of the Carling Avenue Bridge targeted to being in Q1 2022.

On-going cut-and-cover activities such as rock breaking, dewatering and slab work is advancing from Connaught Avenue to the Pinecrest Interchange. Target excavation depths have also been reached in the vicinity of Queensview and Pinecrest Station. In Q4 2021, the temporary bus bridge over the Pinecrest E-N/S Ramp was commissioned and the off ramp was closed to the public. The new S-W Pinecrest on-ramp that has been shifted south of Pinecrest Station was also opened in Q4 2021. A new bus loop north of future Pinecrest Station is being constructed with top lift of asphalt expected in the spring.

In Q4 2021, utility relocation work started near Bayshore Station. At Holly Acres, the new S-W ramp was opened and intersection work on the south side of Highway 417 began. At the Moodie Interchange, bridge construction was completed, and traffic was placed onto the new N-W & S-W ramps. Corkstown Road was also realigned in the vicinity of Moodie Station to facilitate station construction in Q1 2022.

At the southern end of the project, works continued in Q3 and Q4 at Algonquin Station, including station foundation, track wall, suspended slab and platform work, and the bus operator building structural steel was erected and the building has now been fully enclosed.

At the western end of the project, progress has been made at the Moodie Light Maintenance and Storage Facility. Structural steel and cladding is being installed at the service building with concrete slabs expected to start in Q1 2022.

Finally, additional works that occurred in Q4 2021 include foundation and excavation work for the new Churchill pedestrian underpass which will allow pedestrians to cross underneath the SJAM Parkway north of Churchill Avenue. The new pedestrian underpass is targeted to be completed by the end of 2022. Progress was also made at the Woodroffe Pedestrian bridge which has been prepped for the erection of the structural steel in Q1 2022. Construction of the Iris Street bridge is also underway and will continue through the winter with the bridge abutments starting in January 2022. Once complete, guideway and Iris Station work will be able to begin later in 2022.

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. First Article Inspections (FAI) have been conducted on several elements and subsystems, including car shells, car shell painting, heating ventilation and air conditioning (HVAC), seats, passenger information system (PIS) and the bogies. Additionally, serial testing has begun on the several vehicles which represents a major stage leading up to shipment. The first four Stadler vehicles have been delivered to Ottawa. The three remaining vehicles are in production and manufacturing in Switzerland and are expected to be delivered to Ottawa in Spring 2022. The reassembly of the vehicles in Ottawa has begun, which will allow for testing and commissioning to begin.

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 payment information provided in previous updates, the City made a payment in August 2021, reflecting the system performance in July 2021, 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 the system performance of January 2020 to March 2020.

The City continues to review and issue payments on other contractual matters pursuant to the Project Agreement.

Stage 1 and Stage 2 Capital Budgets

The Stage 1 Confederation Line Contingency Fund is \$115 million. To date, \$95.5 million 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.

In keeping with Council's approved 2017 Stage 2 Report (ACS2017- TSD-OTP-0001) and 2019 Stage 2 Report (ACS2019-TSD-OTP-0001), approximately \$2.088 billion has been spent as of December 31, 2021 and relates to the RTG MOU for Belfast Yard and vehicle assembly mobilization (\$378.5M), Confederation Line extension mobilization and construction period payments (\$961.5M), Trillium Line extension construction period payments and financial close for the Revenue Vehicle Supply Contract (\$407.9M), and contingency (\$13.9M). The remaining \$326 million was spent for planning, procurement, project delivery and City retained scope.

| December 31, 2021 | | | | |
|---|---------------|---------------------|--------------------------|---------------------|
| Project Description | Authority | Actual Expenditures | Funds Reserved/Committed | Unspent/Uncommitted |
| Stage 1 | | | | |
| Confederation Line Program (DBFM Contract & City Costs) | 2,130,000,000 | 2,127,964,800 | 2,035,200 | - |
| Contingency | 115,000,000 | 95,536,962 | 19,463,038 | - |
| Total Stage 1 | 2,245,000,000 | 2,223,501,762 | 21,498,238 | - |
| Stage 2 | | | | |
| Confederation Line Extensions DBF Contract | 2,680,832,113 | 961,499,004 | 1,719,333,109 | - |
| Trillium Line Extension DBFM Contract | 810,159,585 | 407,916,598 | 263,720,997 | - |
| Deferred Equity (Maintenance Term Repayment) | 0 | 0 | 138,521,990 | - |
| RTG Stage 2 MOU (includes 38 Alstom vehicles) | 516,184,423 | 378,496,091 | 137,258,223 | 430,109 |
| City Costs (includes project planning, procurement, property acquisitions, City retained scope, and delivery oversight) | 497,629,108 | 326,002,873 | 53,695,900 | 117,930,335 |
| Contingency | 152,640,000 | 13,922,355 | 118,341,029 | 20,376,616 |
| Total Stage 2 | 4,657,445,229 | 2,087,836,920 | 2,430,871,249 | 138,737,060 |

Communications and Stakeholder Relations

In October, the first Stadler FLIRT Vehicle arrived in Ottawa from Switzerland, traveling approximately 7,000 kms through various countries. The new trains will travel along the O-Train South extension. Residents can see the lead up to this major milestone by watching [this video](#).

The installation of Stage 2 signage and hoarding continues along the O-Train extensions. Planning for the next phases of decorative hoarding to be added at more locations is underway.

On December 17, the Finance and Economic Development Committee received an update on the Stage 2 LRT Construction Progress. There is significant progress being made in the East, West and South that residents can see in [this video](#).

In Q3 and Q4 2021, the Stage 2 stakeholder relations and communications team issued:

- 149 public notices
- 20 e-newsletters
- 32 social media posts
- 16 web articles
- 19 educational videos

In 2022, Stage 2 will continue to focus on stakeholder relations and communications strategies to educate, excite, and spread awareness on the LRT project.

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/Stage2Connect.

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