



FAQs: Stage 2 LRT Contract Award

What is the Stage 2 LRT Project?

The Stage 2 expansion of Ottawa's Light Rail Transit O-Train system is a project that will provide the foundation for the National Capital Region's growth and evolution through the 21st century. Stage 2 will extend the O-Train system farther south, east, and west, adding 44 kilometres of new rail and 24 new stations.

When complete, the O-Train system will result in a fully grade separated network that spans nearly 64 kilometres to include 41 stations, 85 vehicles and 3 maintenance and storage facilities.

Procurement Process

How was Stage 2 procured?

Stage 2 is made up of two projects, extending the Confederation and Trillium Lines, however, the project has been divided into three separate contracts, as outlined below:

Confederation Line Extensions:

- The Confederation Line East and West extensions, and their related projects, are being undertaken as a Design-Build-Finance (DBF) procurement; and,
- A Memorandum of Understanding (MOU) with Rideau Transit Group (RTG) for 38 additional Confederation Line Alstom vehicles, the construction of the Belfast Yard Maintenance and Storage Facility (MSF) expansion, and for civil and vehicle maintenance and lifecycle.
 - The \$492 million RTG MOU was approved by Council on March 8, 2017 as part of the Stage 2 LRT Implementation Report

Trillium Line Extension:

- The Trillium Line South extension, and its related projects, are being undertaken as a Design-Build-Finance-Maintain (DBFM) procurement that includes maintenance responsibilities for the existing civil infrastructure and rolling stock to 2048.

How were the proponents evaluated?

Three proponents for each line extension, Confederation and Trillium lines, were shortlisted based on a rigorous pre-qualification process that rated them on experience, available resources and capacity to finance the project.

Procuring a project of this magnitude is an extensive, legally stringent process, overseen by a



FAQs: Stage 2 LRT Contract Award

fairness commissioner to ensure that the outcome is unbiased and impartial and ensures the successful proponent represents the overall best value for the City. Each proponent was evaluated based on their technical qualifications, technical proposal, financial proposal and overall financial wherewithal to deliver each project.

Who is recommended to build the Stage 2 Confederation Line East and West Extensions?

The preferred proponent for the Stage 2 Confederation Line East and West extensions is East-West Connectors (EWC), a consortium of design, engineering and construction companies, lead by Kiewit and Vinci, with extensive experience on light-rail transit systems.

Collectively, EWC's experience in delivering major LRT projects in Canada, and across the globe, includes: Vancouver's SkyTrain; Norfolk, Virginia's Midtown tunnel; and Cairo, Egypt's light rail expansion project, which includes three different lines and more than 100 kilometres of rail.

Who is recommended to build the Stage 2 Trillium Line South Extension?

The preferred proponent for the Stage 2 Trillium Line South Extension is TransitNEXT, a wholly-owned subsidiary of SNC-Lavalin, who is one of the equity partners on the City's Stage 1 Confederation Line project.

SNC-Lavalin has delivered integrated infrastructure engineering solutions for more than a century, on every continent, with significant roles in LRT projects such as: the Canada Line in Vancouver, Eglinton Crosstown in Toronto, REM in Montreal, Parramatta LRT in Australia, the Purple Line in the USA, MSHeireb Tram in Qatar and many others.

What are the next steps?

If Council approves the recommended preferred proponents and the Trillium and Confederation Line projects as described in the Contract Award of Ottawa's Stage 2 Light Rail Transit Projects and Related Matters report, the City can proceed to finalize and execute Transfer Payment Agreements with both the Provincial and Federal governments.

Formal confirmation of the financial contributions of both senior levels of government need to be in place before the City can enter into a Project Agreement with either of the recommended preferred proponents.

The Project Agreements need to be finalized within the dates outlined below in order to guarantee the preferred proponents submitted schedule and price:

- March 2019 – Trillium Line Extension



FAQs: Stage 2 LRT Contract Award

- April 2019 – Confederation Line Extensions

What measures are in place to protect the City from proponent insolvency?

As noted above, the Stage 2 Project Agreements (and all City agreements of this nature) are structured to protect the City from risks associated with a private sector partner becoming insolvent or failing to perform. In the event of insolvency, the City can declare an event of default and proceed to tender the remaining project provided the private sector partner (or its creditors) had not already done so itself as part of its liquidation. The City also retains step in rights to preserve important subcontracts, as well as the power to approve and change the control of the project.

The payment regime for the Stage 2 Confederation and Trillium Line extension contracts is structured to ensure the City never expends more money than has been earned by the contractor for completed works and significant sums are held back to drive on-schedule completion (as well as additional certain bonds). Insolvency, of course, can create schedule delays as a result of the likely change of control of the project.

The City itself faced the insolvency of ConCreate USL Ltd, who were awarded the Strandherd Armstrong Bridge (Vimy Bridge) contract. Some delays to allow for the transfer of the project to new ownership were incurred, but the project was completed under the control of another firm at no additional cost to the City.

What additional projects were bundled with Stage 2?

For the most part, these are planned infrastructure renewal or rehabilitation works ancillary and/or adjacent to the Stage 2 LRT Project that benefit from being bundled into the project through design and construction efficiencies and avoiding schedule risks with the use of a single contractor.

The following tables list the bundled projects that have been included within the overall capital scope of both Trillium Line and the Confederation Line Extension Projects as well as the total sponsor contribution.

Confederation Line Extension Bundled Projects (totaling \$67,000,000)	
Ellwood Diamond Grade Separation	Trinity Ped Bridge and Station (Bayview)
Rideau River Ped Bridge	Power Pack and Transmission Overhaul
Dow's Lake Tunnel Rehab	Year 8 Alstom Vehicle Overhaul



FAQs: Stage 2 LRT Contract Award

Rideau River TL Bridge Rehab	Existing Trillium Line Station Enhancements
Conduits (Trillium Line)	Trillium Line Signal Upgrades
Carleton Tunnel	Sawmill Creek and O-Train Culvert
Trillium Line Bridge over Sawmill Creek	

Trillium Line Extension Bundled Projects (totaling \$107,000,000)	
Montreal Road Bridge	OR 174 Concrete Removal
Jeanne d'Arc/174 Bridge repairs	OR 174 / Greens Creek culvert replacement
Trim Park and Ride expansion	OR 174 Intelligent Transportation Systems
West Transitway North and South Rock Wall	City Traffic Operations – Fibre-optic Breakout Points
Storm/Sanitary Sewer Upgrades Pinecrest Creek	Golden Rod Bridge
Storm/Sanitary Sewer Upgrades for Richmond Complete Streets	Baseline Station Surface Improvements
OR 174 Shefford Road Watermain Crossing	Woodroffe SWP (Design, EA, Implementation)
OR 174 Non-OLRT Culverts	Bridge enhancements at Moodie
OR 174 Integrated OLRT Culverts	Bus layups on Jeanne d’Arc
OR 174 Sound Barriers	Algonquin College Ped Bridge
Pedestrian and/or Cycling Projects Outside LRT Scope	

Project Budget and Funding

What is the Stage 2 LRT project budget and how is it being funded?

The total cost of the Stage 2 LRT project is \$4.66 billion and is jointly funded by the Government of Canada, the Province of Ontario and the City of Ottawa.

In addition to \$2.366 billion from Federal and Provincial grant funding contributions, additional sources of funding include \$35 million in external funding for some of the bundled projects and the remaining \$2.256 billion net cost will be funded by the City from various revenue sources.

The table below provides a further budget funding breakdown:



FAQs: Stage 2 LRT Contract Award

	Cash \$M	Debt \$M	Other (Tax, Rate, PTIF) \$M	Total \$M
Federal and Provincial Grants	2,366			2,366
Other Revenue	35			35
Gas Taxes	382	562		944
Development Charges	194	771		965
Transit taxes		293		288
Non-Transit Funding (Bundled Projects)			59	59
Total	2,977	1,626	59	4,657

Why has the budget increased?

The Stage 2 competitive bid process has yielded prices that are higher than those originally set out in the 2013 TMP estimate, totaling approximately \$1.2 billion. Early cost estimates are based on preliminary designs and have been further refined during the procurement process by the constructor to provide a fixed price.

The Stage 2 LRT project budget increased as a result of two key elements:

- The City included a number of scope additions (totaling approximately \$700 million), that on a project of this magnitude, are elements that should be in place and done right day-one and things that will serve the system well for decades as it grows without the hassle and costs associated with retrofitting or rethinking.
- There has been a significant shift in market drivers that have led to cost increases of up to 30% over the last couple of years in Canada for large public-private-partnership (P3) projects like Stage 2, including for example the items below, which resulted in about \$500 million in increases to the project beyond the City's estimate:
 - Greater than average inflation for specialized construction trades, supplies and materials; and
 - Trade and tariff uncertainty.

While the Stage 2 LRT procurement has been forced to adjust to the cost increases, given the increased scoped enhancements, the reach and the improved overall system reliability that will result, the overall Stage 2 program represents good value for money for the City of Ottawa and its residents. In total, most of the additional upfront costs for Stage 2 are offset by the maintenance savings that have been achieved through the Stage 2 contracts.



FAQs: Stage 2 LRT Contract Award

Will the City be asking the Federal and Provincial Governments for more money?

There is currently no means for the City to apply for additional funding for this project. In addition, a number of added scope elements would not be eligible for Federal and Provincial funding, such as the bundled projects that have been included with these contracts as well as the rehabilitation efforts on the existing Trillium Line.

Should any new funding programs or opportunities be implemented by either level of the government, the City would look to our long-term affordability model with our current and future project complement and make a determination of what best meets our financial and capital needs.

Can the City afford the project?

Yes. The City prudently uses a long-term affordability model which considers all of the transit capital requirements and revenues over 30 years to ensure that the City's debt threshold is not exceeded.

Due to the increase in the estimated Stage 2 LRT project cost, along with other changes in economic factors, the Transit Affordability Model was updated to assess the continued overall affordability and sustainability of the Transit Long Range Financial Plan. The update concludes that Stage 2 of the Light Rail program is affordable.

What impact will Stage 2 have on other City budgets for projects or services?

Stage 2 does not impact any other budgets in the City. Transit operating and capital costs are funded by transit fares, transit taxes, federal and provincial gas taxes, development charges specific to transit and government grants earmarked for transit projects. These funds can not be used for non-transit purposes. Therefore, any funding used for transit is not diverting funds away from other capital projects. Capital investments such as roads for example, are funded from City Wide tax, development charges specific to roads and debt funded by City Wide tax.

What is the total debt on Stage 2?

The total debt on Stage 2 is \$1.6 billion. Of that, \$944 million will be repaid from gas tax and \$965 million will be repaid from development charges. The remaining \$288 million will be repaid by transit taxes.



FAQs: Stage 2 LRT Contract Award

What is the impact of the additional debt on taxpayers?

The projected tax increase in the Transit Long Range Financial Plan has gone from 2.5% to 3%. The impact of this change on a residential property tax bill is \$3.40 annually, for an average home valued at \$400K.

How will Stage 2 impact the City's debt commitments?

The City Treasurer is able to confirm that all long-term debt commitments associated with Stage 2 are in accordance with the City of Ottawa Administration of Capital Financing and Debt Policy.

The City's debt and financial obligation limit has been updated in accordance with the Municipal Act requirements and the City will remain well within these provincial limits. The amount the City pays to service or repay its debt does not exceed the limit set by Council until 2030 to a maximum of 7.9% in 2033, 0.04% over Council's limit. After that point the percentage decreases until it is at 6.3% by 2048. The City's debt servicing level remains well below the provincially imposed limit of 25%.

Could this additional debt affect the City's credit rating and what would be the impact of a downgrade, if there were one?

The City has a very strong credit rating of AAA from Moody's and AA from Standard and Poor's. Based on experience, a change in credit rating has had no discernible impact on the City's cost of borrowing. The credit rating agencies are aware of the City's current and future capital plans and have given no indication that the City's ratings will change in the near future. In their analysis of the City's financial performance, both agencies have highlighted the City's positive fiscal outcomes, manageable debt burden, strong liquidity and a stable economic base.

What is the payment structure of the Stage 2 contracts, when will contractors be paid?

The payment structure of both Stage 2 contracts is a monthly earned value payment regime whereby the City pays the contractor monthly based on the progress they have made that month as verified by the independent certifier. Each monthly payment has a percentage held back with the withheld amount paid out at substantial completion on the Confederation Line, and in the case of Trillium, the majority of that withheld payment is paid back during the maintenance period.

On Confederation Line Extension, the City will withhold \$260M, which gets paid to the contractor on successful completion of the project (as there is no maintenance term on the

Confederation Line contract). On the Trillium Line Extension, the City will withhold around \$160M, of which a small part (\$25M) gets paid at completion of the project and \$135M gets released to the contractor during the maintenance period.

Project Schedule

When will Stage 2 construction start?

Construction will begin in 2019 to extend the O-Train farther south, east, and west. Anticipated construction timelines for each extension are shown below:

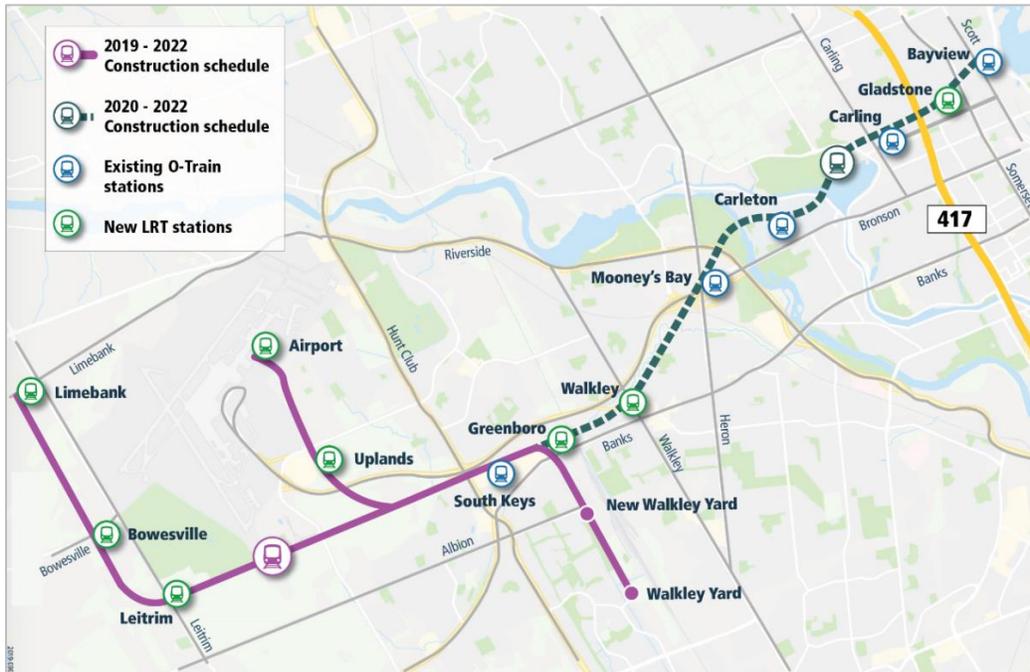
Confederation Line East Extension:



Confederation Line West Extension:



Trillium Line South Extension:



FAQs: Stage 2 LRT Contract Award

When will Stage 2 open?

Stage 2 is anticipated to open to the public in stages:

- The entire Trillium Line South extension, including the existing upgraded Trillium Line, in 2022
- The entire Confederation Line East extension from Blair to Trim will open in 2024
- The entire Confederation Line West extension from Tunney's to both Baseline and Moodie will open in 2025

What caused the project schedule to change?

The Stage 2 competitive bid process has resulted in timelines that extend beyond original estimates, as a result of increased project scope and advanced design efforts.

During the procurement process, proponents unanimously requested extensions as a result of significant scope changes, such as:

- Extending rail 2.5 kilometres further from Bayshore to Moodie and adding an LMSF
- Extending Trillium Line 3.4 kilometres to Limebank Station
- Provincial decision to unbundle the Highway 417 Expansion Project (Maitland Avenue to Highway 416)

The updated schedules reflect expertise from two world class designers and builders that have proposed realistic, deliverable and well considered schedules.

Why has the duration of the Trillium Line shutdown changed?

In March 2017, as part of the Stage 2 LRT Implementation Report, City staff indicated a proposed 16 month shutdown of the existing Trillium Line during Stage 2 construction given the extent of work required to rehabilitate and modernize the existing Trillium Line and the transfer of service availability risk to the Trillium Line proponent for the entire Trillium Line (as opposed to just the extension). The proposed shutdown would allow all construction, rehabilitation, testing and commissioning to occur, as well as an orderly transfer of responsibility from the City's current maintenance contractors to the Trillium Line Proponent.

Following Council approval of the Stage 2 LRT Implementation Report, City staff commenced and concluded the procurement process with the approved preliminary engineering designs. During the in-market period, the City added a number of additional scope elements to the Trillium Line Extension contract – elements that should be in place and done right day-one and that will serve the system well for decades as it grows without the hassle and costs associated with retrofitting and rethinking. However, with these significant improvements came additional requirements with respect to trial-running, testing and commissioning of the new Stadler

FAQs: Stage 2 LRT Contract Award

vehicles and refurbished Alstom vehicles, and a recertification of the line under the Federal Regularity Regime added an estimated 4-6 months to the schedule. The additional scope elements include:

- Expanding the extension to Limebank Station
- An extensive grade-separated bridge at Ellwood Diamond which will allow VIA trains to pass below the Trillium Line (the existing crossing occurs at-grade)
- An overhaul of the existing Alstom vehicle fleet
- A new Trinity Pedestrian Bridge over the alignment and new fare paid entrance at Bayview Station
- A new Gladstone Plaza and re-designed station to allow for growth and direct connection to future adjacent development
- New closed loop fibre communications infrastructure along the entire alignment connecting all stations, integrated with the Confederation Line (Tunney's Pasture to Blair) communications systems
- New modern, advanced Signal & Train Control System providing continuous speed supervision and speed enforcement along the entire alignment
- Further track extensions to existing passing tracks at Gladstone, Carleton and Brookfield stations for increased reliability
- Acquisition of Stadler vehicles (thereby requiring Proponents to recalibrate their plans to accommodate a mixed-vehicle fleet)

Furthermore, the design and construction submission provided by the recommended preferred proponent, TransitNEXT, included the following:

- Significant upgrades throughout the existing alignment to replace sections of track, tie, ballast, structures and drainage infrastructure to reduce maintenance costs and increase reliability, an additional \$136 million upfront investment above the \$100 million increase in scope that was permitted (with an equal \$100 million reduction from the maintenance budget) for a total increase of \$236 million in scope additions.

As a result of all these additional scope elements and the fact that TransitNEXT opted to perform a more robust overhaul and upgrade of the existing Trillium Line than had been previously contemplated to reduce maintenance costs and improve system reliability and performance, their submission included an extended shut down period, spanning from May 2020 to construction completion in 2022. The table below outlines the delta in scope that attributes to the longer shutdown period.



FAQs: Stage 2 LRT Contract Award

It should be noted, in an effort to minimize detours to the extent possible, the City provided proponents with a \$5 million incentive for early completion and none of the proponent bids could find a way to take advantage of the incentive.

Trillium Line Extension	
Scope (March 2017)	Scope (February 2019)
Construction of Gladstone and Walkley	Construction of Gladstone and Walkley
Lengthened Platforms at existing stations (Greenboro, Carleton, Carling, Mooney's Bay, and Bayview)	Lengthened Platforms at existing stations (Greenboro, Carleton, Carling, Mooney's Bay, and Bayview)
Rehabilitation of Rideau River Bridge	Rehabilitation of Rideau River Bridge
Upgrades to the Dow's Lake tunnel	Upgrades to the Dow's Lake tunnel
Track extensions to existing passing tracks (including rock excavation);	Track extensions to existing passing tracks (including rock excavation);
Safety re-certification of the entire line	Safety re-certification of the entire line
Upgrades and retrofit of the existing fleet of six Alstom LINT vehicles	Upgrades and retrofit of the existing fleet of six Alstom LINT vehicles
	Overhaul of existing Alstom fleet
	Ellwood Diamond grade separation
	Significant upgrades throughout existing alignment to replace section of track, ties, ballast, structures and drainage infrastructure to reduce maintenance costs and increase reliability.
	Trinity Pedestrian Bridge and new fare paid entrance west of the alignment at Bayview Station.
	Enhanced Gladstone Plaza and Station to allow for growth and direct connection to future adjacent development.
	New closed loop fibre communications infrastructure along the entire alignment



FAQs: Stage 2 LRT Contract Award

	connecting all stations, integrated with the Confederation Line Communication System
	New modern advanced Signal & Train Control System providing continuous speed supervision and speed enforcement along the entire alignment
	Further track extensions to existing passing tracks at Gladstone, Carleton and Brookfield for increased reliability
	4-6 month schedule increase for new Trial Running Requirement, Testing and Commissioning of the new Stadler vehicles and refurbished Alstom vehicles, and recertification of the line under the Federal Regulatory Regime.

Stage 2 Light Rail Vehicles (LRVs)

What vehicles will be used on the Stage 2 Confederation Line?

The Stage 2 Confederation Line will use the same electric powered Alstom Citadis Spirit cars used for the O-Train Confederation Line. An additional 38 vehicles have been purchased to support the Stage 2 Confederation Line East and West extensions.

The Alstom Citadis car will be energized through an Overhead Catenary System (OCS), the same as the first stage of the Confederation Line. Each two-car train is 98 metres long and has the capacity to carry 600 passengers. These trains offer the best in class and comfort, and feature quiet operation both inside and out. The trains have also been designed to maintain comfort and reliability in all of Ottawa's extreme weather conditions. In addition, regenerative braking technology and a 98 per cent efficient electric drive system mean a state-of-the-art, zero-emission light rail train.

Once Stage 2 LRT is complete, passengers travelling on the electric powered Confederation Line will be able to travel emission-free from Trim Road in the east to Moodie Drive and Algonquin College in the west.



FAQs: Stage 2 LRT Contract Award

What vehicles will be used on the Stage 2 Trillium Line?

Two types of diesel-powered vehicles will be used on the Trillium Line. The City will use both the Alstom Coradia Lint, currently in use on the existing Trillium Line, and the high efficiency Stadler FLIRT. The mainline will be serviced by the Stadler FLIRT vehicles and coupled Alstom Cordia Lints; the Airport Link will be serviced by the Alstom Cordia Lints.

Mobility

How will Stage 2 impact mobility during construction?

Roadway impacts will include temporary road closures, lane closures, and detours. The City will use provisions in the PA to ensure that traffic control plans used to accomplish construction minimizes impacts to all road users.

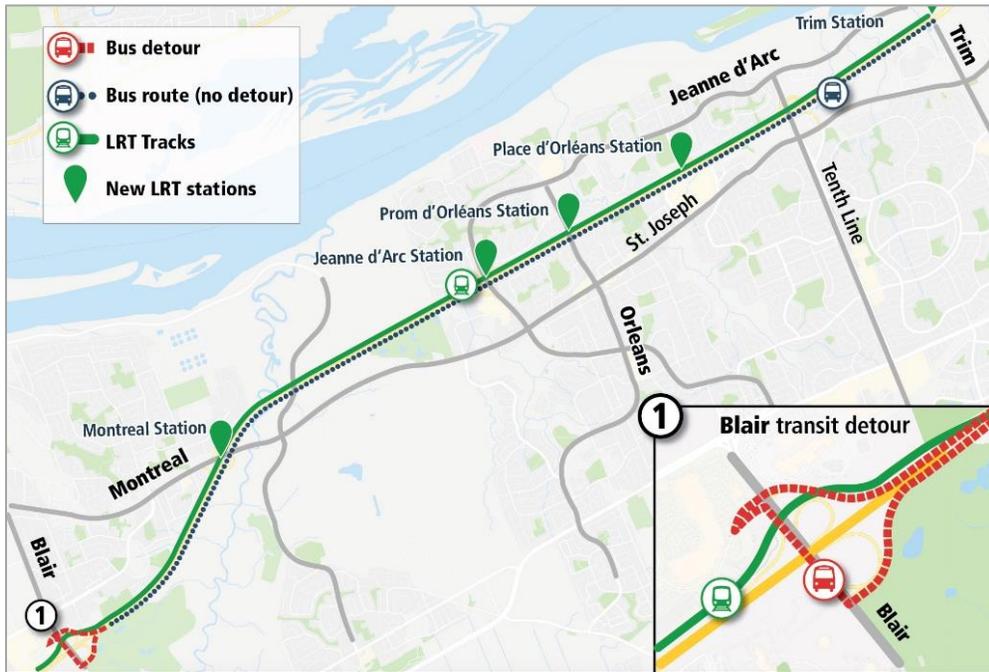
Mobility Matters was built into the Project Agreement for both the Trillium Line and Confederation Line extensions to influence the proponents' approach to maintaining a high level of lane availability during construction and to encourage an approach to construction that minimizes the number and duration of lane closures on the Transitway, and public roads and multi-use pathways.

Mobility Matters incents proponents to develop construction plans that keep the Transitway operating as late as possible into their schedule, while delivering on-time performance.

With respect to multi-use pathways, wherever pathways are not specifically identified for closure during construction, the preferred proponents are obligated to provide a detour route that adds no more than 20% additional distance. The detours must be a paved asphalt surface, unless the duration is less than seven days, in which case a temporary granular pathway detour is permitted.

Below are graphics illustrating associated detours and their anticipated timelines.

Confederation Line East Extension Detours: 2021/2022 to 2024



Confederation Line West Extension Detours: 2022 to 2025



Trillium Line South Extension Detours: 2020 to 2022



How will the City communicate mobility impacts?

Advance notice for the public, via fixed signs, portable variable message signs, public announcements on City website/social media streams, will be initiated considering the magnitude of the impact. Information will be provided to the public prior to the implementation of any road or pathway closure or bus stop relocation, with the aim of allowing the public to plan their travel mode and routing accordingly, as well limit the inconveniences associated with construction.

Stage 2 System Design

Connectivity - How can I get to the stations?

Ensuring that key local pedestrian and cyclist networks are integrated into the Stage 2 LRT alignment, including stations, is a critical element of the project. The project will encourage active transportation through the creation of approximately 25 kilometres of multi-use pathways (MUPs), cycle-tracks and pedestrian bridges. This will add roughly \$20 million of infrastructure to advance the City of Ottawa's pedestrian and cyclist network by providing



FAQs: Stage 2 LRT Contract Award

critical connections, as well as fully accessible pathways to each Stage 2 LRT station.

Will Stage 2 include public art?

The Stage 2 Public Art Program has developed a public art plan, based upon the understanding that public art in transit facilities allows for transformative and positive experiences by the transit user.

Based on lessons learned from Stage 1 Confederation Line Project, the City has expanded the Stage 2 Calls to Artists to the international market. The City has also shifted from individual artists, assigned to a single station artwork installation, to a format of grouping of stations to allow for the development of creative narratives.

Three separate RFQs, two for Confederation Line and one for Trillium Line, will be released. Artist teams will be identified, as recommended by external selection committees, to design and implement public art along Stage 2.

Will Stage 2 be accessible?

Yes, Stage 2 stations and trains will be fully accessible. The vehicles operating on Confederation Line (Alstom) and Trillium Line (Stadler) will meet or exceed accessibility standards to ensure all customers receive reliable, safe and comfortable service.

Stations will meet or exceed accessibility standards by providing redundant means of movement and connectivity through the use of elevators and escalators, as well as platforms designed for accessibility. Station features will include:

- Barrier-free path of travel to entrances of stations;
- Accessible fare gates at each entrance, providing easy access for customers using mobility devices or service animals;
- Tactile wayfinding tiles will trace the accessible route through the fare gates, to elevators, platforms and exits;
- Transecure waiting areas on the train platform will include accessible benches and tactile/Braille signs indicating the direction of service;
- Tactile warning strips and inter-car barriers to keep everyone safely away from the platform edge;
- Audio announcements and visual displays for waiting passengers will precede each train's arrival on the platform and will describe the direction of travel;
- Service alerts will be shown visually on the platform displays and announced audibly on



FAQs: Stage 2 LRT Contract Award

the public-address system; and

- All wayfinding and safety signage will be provided following the applicable accessibility standards (including type size, tactile signage, and appropriate colour contrast).

Where will washrooms be located on the expanded O-Train network?

When Stage 2 is complete, washrooms will be located at the following stations:

Confederation Line:

- Moodie
- Baseline
- Lincoln Fields
- Tunney's Pasture
- Hurdman
- Blair
- Place D'Orleans
- Trim

Trillium Line:

- Bayview
- Limebank

Will I have to transfer if travelling to and from Airport Station?

Yes, regular service will have Airport bound Trillium Line passengers transfer at South Keys Station onto the Airport Link. Trains on the Airport Link will run from South Keys Station to Airport Station. South Keys Station is being configured to allow an easy, same-platform connection to the trains operating on the Airport link. Service will be coordinated to keep transfer times to a minimum at South Keys Station. Buses will operate to the airport only during the overnight hours, when the train line is closed for regular maintenance.