



International Federation of Municipal Engineering
Fédération Internationale des Ingénieries Municipales

Technical Brief No.5

Development of the Confederation Line, Ottawa, Canada.

Project Overview (IFME visit April 2016)

The challenge

Ottawa suffers from critical traffic congestion at key times of the day. Despite having an extensive public transit system that consists of a fleet of buses the congestion has become so serious that it is restricting Ottawa's development.

The existing public transit system is the preferred method of accessing the city and accordingly is used actively and extensively by the Ottawa population. However, such is the demand that this public transit system has become the reason behind the congestion source with long lines of slow moving buses congesting the existing road system every working day.



Queues of buses resulting in severe congestion on the Ottawa urban highway system

The Transit Challenge

- Ottawa's population is projected to grow 30 percent by 2031.
- Public transportation is already near or at capacity in the downtown core.
- Every new bus added in the downtown slows our existing buses.
- Ottawa's prosperity depends on moving people more efficiently

The Solution

In developing a solution it is critical to understand that Ottawa encounters problem that differs from other cities. The public transit is already the preferred method of commuter transport and private car use is recognised as a minimal element of the peak highway congestion levels. Therefore, following formal transport assessment and modelling, the optimum solution to Ottawa's highway congestion is found by adjusting the method and capacity of the public transit system by introducing a light rail transit system. It should be noted that enlargement of the Highway network did not realise the long term benefits that a combination of overground and underground light rail based system would generate.

The Confederation Line is part adaption of the O-Train and Trillium rail networks and consists of a grade separated, high frequency service light metro project.

Therefore following public consultation and balancing the high capital cost of \$2.1 billion against the environmental and future benefits associated with such a major project, the political decisions were taken to start construction of this light rail transit project in 2013



Project Overview

- Ottawa has embarked on the largest infrastructure project since the building of the Rideau Canal.
- The City of Ottawa will be the ultimate Owner.
- Rideau Transit Group will assume the responsibility for the ongoing maintenance of the Confederation Line on behalf of the city as Rideau Transit Maintenance.
- OLRT Constructors is the group within RTG responsible for the build of the system.

Scope of the Design and Construction

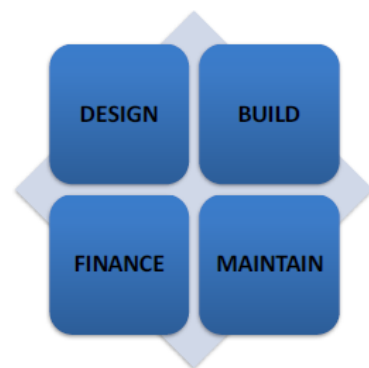
- Highway 417 widening
- Belfast Yard Maintenance and Storage Facility
- 13 Stations (9 at grade and 4 underground)
- 10-km Guideway (Civil Works, Structures, Trackworks)
- 2.5-km Underground Downtown Tunnel
- Vehicles and Systems (Train Control, Communications, Overhead Catenary System, Traction Power)
- Control Centre

Design-Build-Maintain-Operate Team

The line is the first phase of a 30 year design-Build-Finance-Operate agreement with Rideau Transit Group – refer to images section for details of the team partners.

Procurement Model – P3

This is a long-term performance based approach for procuring projects where the private sector assumes a major share of the responsibility in terms of Risk and Financing.



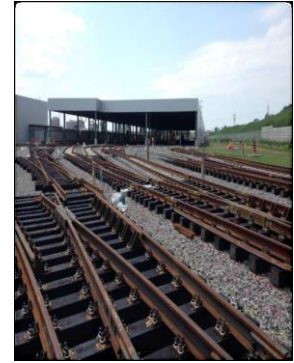
- Design, Build, Finance, Maintain project
- 5 years of construction with fixed-price and delivery date
- 30-year maintenance contract ties to strong motivation for quality maintenance of the system over the long term

Schedule



Works Completed to Date

Belfast Yard Maintenance and Storage Facility



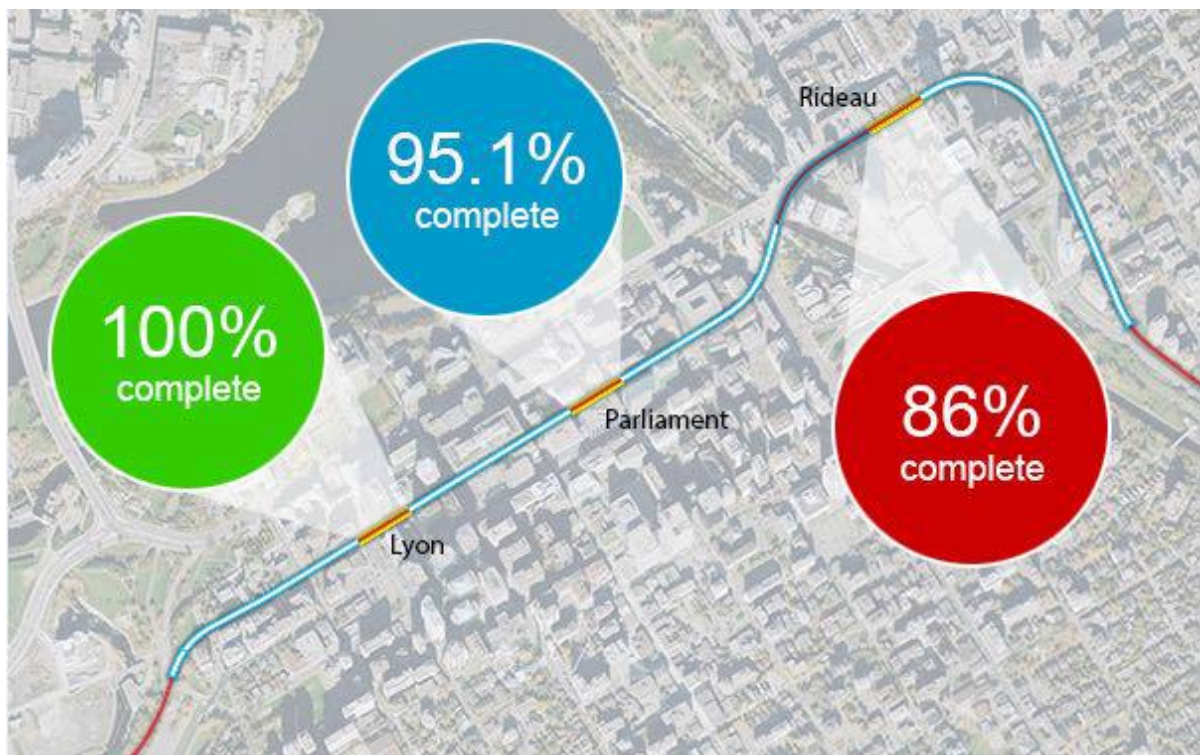
Light Rail Vehicle



34 Alstom Citadis LRVs; fully accessible.

Each train will consist of 2 modular vehicles, totalling a capacity of - 600 passengers and 98 metres in length - Length of a football field!

Tunnel

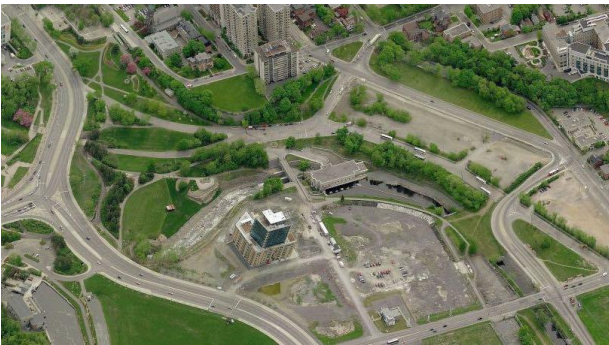


Tunnel excavation commenced summer 2013 and is scheduled for completion fall 2017

Tunnel-Sequential Excavation Method (SEM)



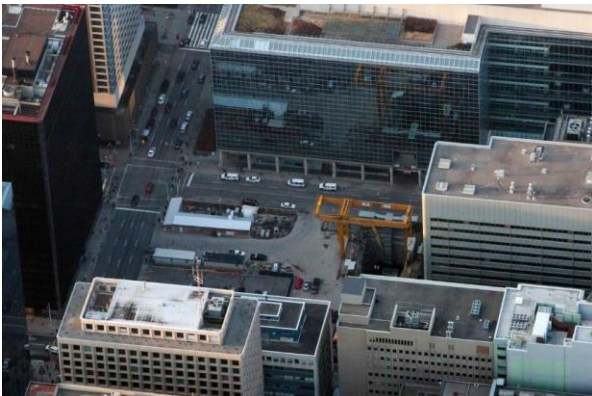
West Portal (Looking SE)



West portal



West Running Tunnel



Central Shaft



East Portal



Station Features

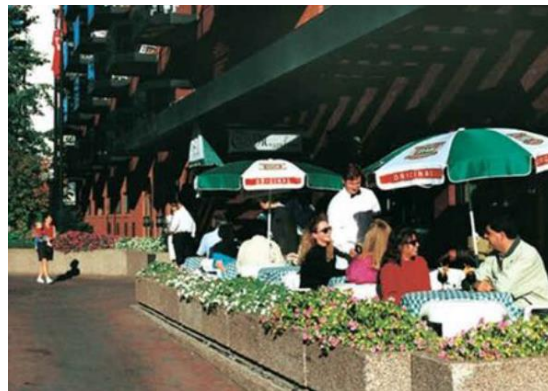
- Simple attractive designs
- Eye-catching architectural themes throughout
- Inviting and safe public spaces
- Intuitive passenger flows
- Integrated with pedestrian pathways
- Extensive features for cyclists
- Accessibility best practices
- Design incorporating Ash Borer Timber
- Public art showcases



Changing Centretown streets from this...



... to this!



(Queen Street)

From this...



... to this!



(Mackenzie King Bridge)

From this...



...to this!



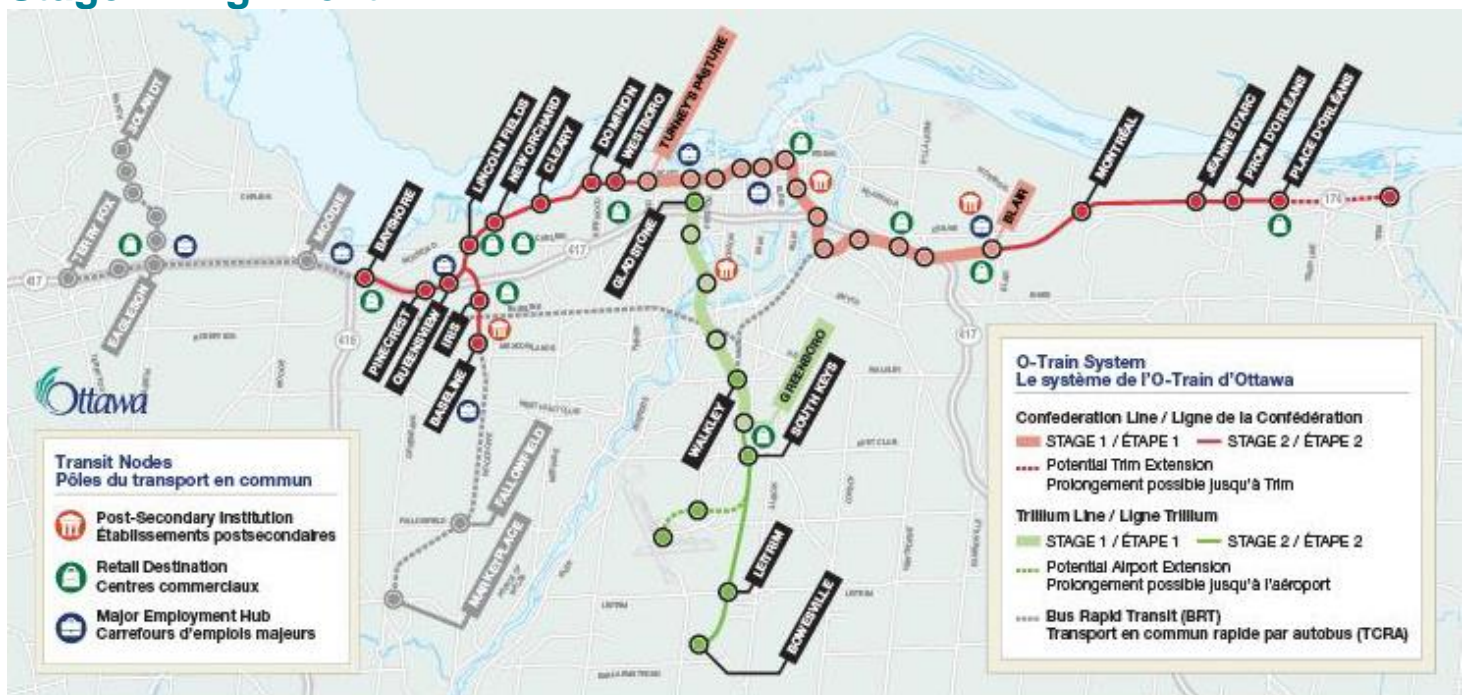
Stage 2 expansion of the Confederation line both East and westward.

Stage 2 Background

- \$3-billion expansion approved unanimously by Ottawa City Council in 2013
- EA for project approved in July 2015
- Includes three extensions to Stage 1 – going into suburbs to east, west and south
- Will go as far east as Place d'Orléans, as far west as Bayshore/Algonquin College, and as far south as Riverside South (also seeking funding to extend to Trim Rd. in east and to Ottawa International Airport)
- Includes 30 kilometres of new rail and 19 new RT stations
- When done in 2023, total system will be more than 40 kilometres of rail and 36 stations



Stage 2 Alignment



- Transit Nodes**
Pôles du transport en commun
- Post-Secondary Institution
Établissements postsecondaires
 - Retail Destination
Centres commerciaux
 - Major Employment Hub
Carrefours d'emplois majeurs

- O-Train System**
Le système de l'O-Train d'Ottawa
- Confederation Line / Ligne de la Confédération**
- STAGE 1 / ÉTAPE 1
 - STAGE 2 / ÉTAPE 2
 - Potential Trim Extension
Prolongement possible jusqu'à Trim
- Trillium Line / Ligne Trillium**
- STAGE 1 / ÉTAPE 1
 - STAGE 2 / ÉTAPE 2
 - Potential Airport Extension
Prolongement possible jusqu'à l'aéroport
 - Bus Rapid Transit (BRT)
Transport en commun rapide par autobus (TCRA)

Stage 2 Tunnel

Western extension includes a **3-km tunnel** running along the Sir John A. Macdonald Parkway:

- Starts just west of Dominion Station
- Ends just south of Richmond Rd. overpass over the Parkway (Pinecrest Creek Corridor)

Stage 2 Benefits

GHG emissions

- Reduced by 155,500 tonnes for Stage 2 alone
- More than 200,000 tonnes combined Stage 1 and 2 over a 25- year period

Economy

- Will generate more than 24,000 person years of direct and indirect employment
- Economic impact of \$3.8 billion

Increased Ridership

- 13.5 million more trips/year by 2031

Decreased Congestion

- 14,000 fewer vehicles during rush hour; 450,000 annual bus trips eliminated from the Sir John A. Macdonald Parkway

With Stage 1 & 2 combined, 70% of Ottawa residents will live within five kilometres of a light rail station

John Thomson C.Eng. C.Env. FICE FIAT

Vice-President of the International Federation of Municipal Engineering.

ICE Municipal Expert Panel

Images





ON TRACK
SUR LA VOIE
2018

 **O-Train**

Ligne de la
Confédération
Line

2015-005

 **Ottawa**

 **Design-Build-Maintain-Operate Team**

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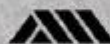

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