

Report to/Rapport au:

Council / Conseil

December 4, 2012

4 décembre 2012

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CITY WIDE / À L'ÉCHELLE DE LA VILLE

Ref N°: ACS2012-ICS-RIO-0004

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**SUBJECT:** DESIGN, BUILD, FINANCE AND MAINTENANCE OF OTTAWA'S  
LIGHT RAIL TRANSIT (OLRT) PROJECT

**OBJET :** CONCEPTION, CONSTRUCTION, FINANCEMENT ET ENTRETIEN DU  
PROJET DE TRAIN LÉGER SUR RAIL D'OTTAWA (TLRO)

### **REPORT RECOMMENDATIONS**

That Council:

1. Receive the results of the Request for Proposals (RFP) process, as described in this report, and as overseen by a Fairness Commissioner, to design, build, finance and maintain the Ottawa Light Rail Transit Project (OLRT) and to build and finance the Highway 417 widening project, and approve the selection of Rideau Transit Group as the Preferred Proponent to design, build, finance and maintain the OLRT project, and to build and finance the Highway 417 widening project including the undertaking of certain related civic works in the manner described in this report.
2. Approve the budgets and funding sources for the projects as follows:
  - a. The \$2.130B OLRT project budget and funding sources as outlined in this report;
  - b. The project budgets and funding sources for the associated works as outlined in this report and as follows:
    - i. Highway 417 widening (\$226 million);
    - ii. OLRT transition (\$63 million); and
    - iii. Project contingency (\$100 million).
  - c. The City's payment obligations under the Project Agreement, both during the construction term and the maintenance and service term, as described in this report;



- Canada, and the Memorandum of Understanding with VIA Rail Canada, and any documents, agreements or instruments resulting therefrom on and subject to the terms and conditions described in this report;
- c. The delegation of authority to the Deputy City Manager, Planning and Infrastructure, to complete and execute the agreements required for station integrations, within the project's budget authority and subject to the terms and conditions described in this report;
  - d. The expropriations as follows and in accordance with any related legislation:
    - i. The enactment of a by-law authorizing the making of an application to expropriate certain lands as set out in Schedule 1 of this report;
    - ii. The enactment of a by-law to authorize the expropriation of certain lands for which expropriation proceedings were commenced in June of 2012, as set out in Schedule 2 of this report.
5. The delegation of authority to the Deputy City Manager, Planning and Infrastructure, to negotiate, approve, execute, deliver, amend and extend the Utility Works Infrastructure Letter of Agreement with Hydro Ottawa Limited, subject to the terms described in this report.
6. Approve the re-naming of the OLRT project as the "Confederation Line" as described in this report.
7. Direct staff to prepare the By-Law and Official Plan amendments required for the Ottawa Light Rail Project as described in this report and in accordance with legislation.
8. Approve the amendments to the City's Noise By-law (By-law Number 2004-253), as outlined in Schedule 3.

## **RECOMMANDATIONS DU RAPPORT**

**Que le Conseil :**

1. Reçoive les résultats du processus de Demande de propositions (DP), comme décrit dans le présent rapport et supervisé par un commissaire de l'équité, portant sur la conception, la construction, le financement et l'entretien du projet de train léger sur rail d'Ottawa (TLRO) et sur la construction et le financement du projet d'élargissement de l'autoroute 417. Qu'il approuve la sélection du groupe Rideau Transit Group comme candidat privilégié pour la conception, la construction, le financement et l'entretien du projet de TLRO et la construction et le financement du projet d'élargissement de l'autoroute 417, y compris la réalisation de certains travaux de génie civil connexes de la manière décrite dans le présent rapport.

- 2. Approuve les budgets et les sources de financement du projet comme suit :**
  - a. Le budget de 2,130 milliards de dollars du projet du TLRO et les sources de financement définis dans le présent rapport.**
  - b. Les budgets et sources de financement du projet prévus pour les travaux connexes décrits dans le présent rapport, comme suit :**
    - i. élargissement de l'autoroute 417 (226 millions de dollars);**
    - ii. transition au TLRO (63 millions de dollars); et,**
    - iii. fonds de prévoyance du projet (100 millions de dollars).**
  - c. En vertu de l'accord de projet, l'obligation de paiement de la Ville, tant durant la période de construction que durant la période d'entretien et de service, telle que décrite dans le présent rapport.**
  - d. La délégation de pouvoirs à la trésorière municipale pour prendre toutes les dispositions et les mesures jugées nécessaires pour donner effet aux budgets et sources de financement approuvés pour le projet de TLRO, l'élargissement de l'autoroute 417, la transition au TLRO et le fonds de prévoyance du projet, sous réserve des conditions énoncées dans le présent rapport.**
  - e. La délégation des pouvoirs nécessaires de négociation au directeur municipal; et des pouvoirs nécessaires au maire pour conclure et exécuter les modifications nécessaires aux accords de contribution fédéral et provincial au projet du TLRO et au protocole d'entente avec Infrastructure Ontario, sous réserve des conditions décrites dans le présent rapport et dans le rapport approuvé par le Conseil le 14 juillet 2011 intitulé « Mise en œuvre du projet de train léger d'Ottawa (TLRO) (Réf. n° ACS2001-ICS-RIO-0002) » et prendre toutes les dispositions et les mesures jugées nécessaires pour donner effet à ce qui précède, sous réserve des conditions énoncées dans le présent rapport.**
- 3. Délègue au directeur municipal les pouvoirs nécessaires pour négocier, approuver, signer, exécuter, modifier et prolonger l'accord de projet et les accords auxiliaires connexes liés au projet de TLRO, au projet d'élargissement de l'autoroute 417 et aux travaux de génie civil connexes sous réserve des conditions énoncées dans le présent rapport.**
- 4. Approuve les acquisitions de terrains nécessaires pour le projet de TLRO et les projets connexes comme suit :**
  - a. Les ententes négociées, dont la liste figure à l'Appendice 2, décrites dans le présent rapport, comme suit :**
    - i. Le protocole d'entente avec la Commission de la capitale nationale (CCN), y compris l'approbation du contrat de dépôt de la somme de 24,5 millions de dollars entre les mains de la CCN, qui sera détenue jusqu'à la conclusion d'une convention de transfert de terres avec la Commission de la capitale nationale.**
    - ii. La convention de représentation avec Hydro Ottawa Limited.**



**8. Approuve les modifications nécessaires au Règlement sur le bruit (Règlement N° 253 – 2004), comme décrit à l'Annexe 3.**

EXECUTIVE SUMMARY

The Ottawa Light Rail Transit (OLRT) project will provide rapid and high quality transit service from the Tunney's Pasture employment node in the west to Blair Station in the east. This 12.5km, 13 station LRT system includes a tunnel to address the increasingly severe bottleneck through the downtown core that slows service and challenges the reliability of the City's transit system today. It is the largest infrastructure project in the City's history and it implements the light rail elements of Increment 1 of the first phase of the City's 2008 Transportation Master Plan (TMP).

***Meeting Council's Challenge***

The new term of Council established tough criteria for a successful OLRT Project. In May of 2011, Council directed staff to speed up the implementation of the project by a full year and to develop a procurement model that would bring the private sector into the project early in the design process, to leverage their innovation and expertise to deliver the best value possible to the City.

In July 2011, Council approved the preliminary design of the OLRT project and directed staff to commence the procurement process as a Design, Build, Finance and Maintain model. This model brings equity partners to the table with the City to ensure that the winning bidder would be financially at risk for their design as well as their construction and maintenance and service term. To ensure the City would achieve best value for its investment, Council also approved a partnership with Infrastructure Ontario (IO) to act as the City's commercial procurement lead to leverage their experience with the Alternative Financing and Procurement (AFP) approach used in more than 50 projects across the Province. Finally, Council directed staff to design to the \$2.1 billion budget approved in January 2010 and also to absorb inflation costs within that amount that were not budgeted for at that time. Also not included, and so absorbed, in the original project budget were the higher borrowing costs associated with private financing entailed in the AFP approach.

***The Procurement Process***

With this criterion established staff immediately began work on a plan to ensure the property required for OLRT project construction could be secured and commenced the Request-for-Qualifications (RFQ) process to shortlist eligible bidders on the project contract. From an initial field of six integrated teams of companies that presented themselves, City staff and IO shortlisted the strongest three teams to compete in the Request-for-Proposal (RFP) phase of the procurement.

In October 2011, the City commenced the RFP process and coordinated closely with all three teams to refine the project designs and submit proposals. Among these

refinements were design changes to Rideau, Bayview and Train stations that were approved by Council in March 2012. Leveraging their international expertise in thousands of kilometres of tunnel and rail projects across the globe, the consortia advanced three compelling proposals that included advanced project designs, construction schedules, financing details and a 30-year maintenance and service plan. In September 2012, the City received these designs in the form of final bids in response to the RFP and performance specification documents. The detailed IO evaluation process was then applied.

### ***A Winning Proposal***

This report provides Council with the results of the RFP process including: a recommended private sector team to design, build, finance and maintain the OLRT project, and an overview of their proposed design, construction schedule, methods and project cost. The recommended team's design meets all success criterion identified by Council, including:

- Delivery of a high quality light rail transit project from Tunney's Pasture to Blair stations; complete with 13 functional and attractive stations;
- A system capable of growing with the City to ultimately carry up to 24,000 people per hour per direction;
- A fully accessible system, convenient for all users;
- A fixed price for delivery of all aspects of the system including the tunnel, civil work and vehicles;
- A capital cost that maintains the original project budget (\$2.130 billion) including accounting for inflation and the cost of private sector financing;
- An alternate Bus Rapid Transit (BRT) system during construction, to ensure mobility throughout the conversion of the Transitway;
- Initiation of revenue service on time for the accelerated completion date in Spring 2018;
- Completion of civil construction in the downtown core in time for July 1, 2017 – the 150<sup>th</sup> anniversary of Canadian Confederation;
- A design that will reflect the NCC's Capital interest at the five federal stations and assist in achieving federal land use approvals;
- A service proven light rail vehicle that fully meets the Canadian Content requirements set out by the Ministry of Transportation of Ontario (MTO);
- A system designed for long-term affordability and energy efficiency;
- Price protection to acquire additional vehicles in order to increase the vehicle fleet in response to ridership growth; and
- Full risk transfer to the Proponent for tunnel and below surface station geotechnical risks.

In addition, this report advances final authority to complete various property acquisitions, approve a number of MOUs with key project partners, and update Council on business development and station integration negotiations. The report also outlines the proposed rebranding of the OLRT project to the "Confederation Line."

## RÉSUMÉ

Le projet de train léger sur rail d'Ottawa (TLRO) permettra à la Ville d'offrir un service de transport en commun rapide et de grande qualité du pôle d'emploi de Pré Tunney dans l'ouest à la station Blair dans l'est. Ce réseau de TLR de 12,5 km de long comportant 13 stations prévoit la mise en place d'un tunnel pour régler les graves problèmes d'embouteillage toujours croissants dans le centre-ville qui ralentissent le service et remettent en cause la fiabilité du réseau de transport en commun actuel. Il s'agit du plus important projet d'infrastructure de l'histoire de la Ville, qui mettra en œuvre les éléments du train léger de l'étape 1 de la première phase du Plan directeur des transports (PDT) de 2008 de la Ville.

### ***Relever les défis imposés par le Conseil***

Le nouveau Conseil a établi des critères stricts pour assurer le succès du projet de TLRO. En mai 2011, le Conseil a demandé au personnel de devancer d'un an la mise en œuvre du projet et d'élaborer un modèle d'approvisionnement qui inclurait le secteur privé dès les débuts du projet, soit à l'étape du processus de conception, afin de tirer parti de l'innovation et l'expertise de ces entreprises dans le but d'offrir la meilleure valeur possible à la Ville.

En juillet 2011, le Conseil a approuvé la conception préliminaire du projet de TLRO et a demandé au personnel de lancer le processus d'approvisionnement sous forme de modèle conception-construction-finance-entretien. Ce modèle prévoit que les partenaires associés travaillent de concert avec la Ville pour veiller à ce que les candidats sélectionnés soient responsables du risque financier associé à la conception présentée ainsi que des travaux de construction, d'entretien et du service. Afin d'assurer que la Ville obtienne la meilleure valeur pour son investissement, le Conseil a également approuvé la formation d'un partenariat avec Infrastructure Ontario (IO) qui assumera la responsabilité de l'approvisionnement commercial pour la Ville et pour utiliser leur expérience avec le modèle de diversification des modes d'approvisionnement et de financement utilisé dans plus de 50 projets dans la province. Finalement, le Conseil a demandé au Conseil de prévoir une conception en fonction du budget de 2,1 milliards de dollars approuvé en janvier 2010 tout en absorbant les coûts liés à l'inflation qui n'ont pas été prévus en 2010.

Par ailleurs, le budget original du projet n'avait pas prévu que les frais d'emprunt associés à un financement prévu dans le cadre d'un modèle de diversification des modes d'approvisionnement et de financement étaient plus élevés. Ces coûts devaient donc être absorbés.

### ***Le processus d'approvisionnement***

Une fois les nouveaux critères établis de manière très stricte, le personnel a immédiatement commencé à travailler à l'élaboration d'un plan pour s'assurer que l'acquisition des propriétés pour le projet TLRO puisse être effectuée et a amorcé le processus de Demande de qualifications (DQ) afin de sélectionner les soumissionnaires admissibles pour ce projet. Parmi les six équipes d'entreprises intégrées qui ont



présenté une manifestation d'intérêt, le personnel municipal et IO ont sélectionné les trois équipes les plus solides qui se livreraient concurrence à l'étape de la Demande de propositions (DP).

En octobre 2011, la Ville lance le processus de DP auquel collaborent les trois équipes en vue d'affiner la conception du projet et de soumettre une proposition. Parmi les raffinements apportés, des modifications ont été apportées aux stations Rideau, Bayview et Train et approuvées en mars 2012 par le Conseil. Forts de leur grande expérience internationale acquise dans des projets de construction de milliers de kilomètre de tunnel et de chemin de fer partout dans le monde, les consortiums ont soumis trois propositions attrayantes qui comprenaient les conceptions de projet perfectionnées, les échéanciers de construction, des détails sur le financement et un plan d'entretien et de service sur 30 ans. En septembre 2012, la Ville a reçu trois concepts sous la forme de soumission définitive en réponse à la DP ainsi que les documents de spécifications fonctionnelles. Le processus détaillé d'évaluation d'IO a alors été mis en œuvre.

### ***Proposition sélectionnée***

Ce rapport présente au Conseil les résultats du processus de DP, y compris le nom de l'équipe du secteur privé qui sera responsable de la conception, de la construction, du financement et de l'entretien du projet de TLRO ainsi qu'un aperçu de la proposition de concept, de l'échéancier de la construction, des méthodes et des coûts du projet. La conception présentée par l'équipe recommandée satisfait à tous les critères établis par le Conseil pour garantir le succès du projet, notamment :

- Livraison d'un projet de train léger sur rail de grande qualité de la station Pré Tunney à la station Blair, pour un total de 13 stations fonctionnelles et attrayantes.
- Un réseau qui peut grandir avec la Ville et qui pourrait éventuellement assurer le transport de 24 000 personnes à l'heure par direction.
- Un réseau entièrement accessible à tous les usagers.
- Un prix fixe pour la livraison de tous les volets du projet, notamment le tunnel, les travaux de génie civil et les véhicules.
- Des coûts d'immobilisations qui respectent le montant du budget d'abord établi pour le projet (2,130 milliards de dollars), en tenant compte notamment de l'inflation et du coût d'un emprunt dans le secteur privé.
- L'établissement d'un réseau de transport commun rapide en autobus durant la construction, afin de garantir la mobilité en transformant le Transitway.
- La mise en place d'un mode de paiement lié à la livraison ponctuelle du service, axé sur la date de réalisation accélérée du printemps 2018.
- La réalisation des travaux de construction civile dans le centre-ville à temps pour le 1<sup>er</sup> juillet 2017, qui est la date du 150<sup>e</sup> anniversaire de la Confédération canadienne.
- Une conception qui tient compte de la participation de la CCN aux cinq stations fédérales et qui aide à l'obtention des approbations pour l'utilisation du territoire domanial.

- Un véhicule léger sur rail qui a fait ses preuves et qui satisfait entièrement aux exigences relatives au contenu canadien établies par le ministère des Transports de l'Ontario (MTO).
- Un réseau conçu pour garantir l'abordabilité à long terme et l'efficacité énergétique.
- Des mesures de protection du prix pour l'acquisition de véhicules supplémentaires afin de répondre à la croissance de l'achalandage;
- Le transfert intégral du risque au candidat sélectionné relativement aux risques géotechniques liés à l'excavation du tunnel et à la construction des stations souterraines.

De plus, on précise dans le présent rapport les pouvoirs à déléguer aux parties concernées pour conclure les acquisitions de bien-fonds, approuver un certain nombre de protocoles d'entente avec les partenaires principaux du projet et informer le Conseil sur l'évolution du dossier et des négociations portant sur l'intégration des stations. Le présent rapport décrit le changement d'image qui est orchestré pour le projet de TLRO qui deviendra la « Ligne de la Confédération ».

## BACKGROUND

In January 2010, Council approved the [Downtown Ottawa Transit Tunnel \(DOTT\) Planning and Environmental Assessment Study – Recommended Plan](#) (Ref N° ACS2009-ICS-PGM-0214), providing authority to begin the Environmental Assessment process, preliminary engineering activities and property acquisitions for the OLRT project.

At that time, the cost estimate to complete the project was established at \$2.1 billion in 2009 dollars along with a budget of \$155 million to maintain mobility during construction, with the expected need to take the Transitway temporarily out of service for a period of time during construction. This initial estimate for the project did not include approximately \$440 million in inflation through to the expected project completion in 2019. In addition, the original budget did not include a provision for the expected \$177 million in construction period financing and transaction costs associated with this form of procurement.

In December 2009 and June 2010, the Province of Ontario and the Government of Canada, respectively, made formal commitments of \$600 million in capital funding to support the construction of the OLRT project.

The federal and provincial financial commitments are capped and do not increase to reflect inflation. Therefore all inflation risks are borne by the City of Ottawa; as are any escalation costs.

In 2011, the newly elected Mayor and Council provided clear direction regarding the OLRT project budget and implementation schedule. In May 2011, Council approved the "[OLRT Schedule Acceleration and Procurement Option Selection](#)" Report (Ref N° ACS2011-ICS-RIO-0001). This report accelerated the completion of the OLRT project by a full year, from 2019 to the spring of 2018. This report also directed the use of

Infrastructure Ontario's well-developed and proven procurement strategy, known as Alternative Financing and Procurement (AFP), to drive competition.

In July 2011, Council approved the "[Implementation of the Ottawa Light Rail Transit \(OLRT\) Project](#)" Report (Ref N° ACS2011-ICS-RIO-0002). This report presented a revised alignment, reestablished the \$2.1 billion budget target and directed staff to implement the OLRT project using a Design Build Finance Maintain (DBFM) procurement model. By requiring that the Constructor take responsibility for delivering the desired system outcomes through a DBFM procurement process, the City avoids taking implementation risks that are typically associated with the traditional approach to procuring infrastructure projects. Council also authorized the engagement of Infrastructure Ontario (IO) as the City's commercial procurement lead.

In October 2011, the competitive Request for Qualifications (RFQ) process for the OLRT project resulted in a shortlist of three private sector teams. The Request for Proposals (RFP) document was released to the shortlisted teams with final proposals due from each team as follows:

- Technical submission on September 10, 2012, and
- Financial submission on October 1, 2012.

Throughout the procurement process, multiple design review presentations and commercial confidential meetings were held with each team to ensure clear focus was maintained on achieving excellence in system design and compliance with the Project Specific Output Specifications set out in the procurement documents.

In March 2012, City Council directed staff to work with the Province to "bundle" the planned widening of the Highway 417 from the Nicholas Street on-ramp to the junction of Highway 174 and, to allow the scope of the Highway 417 project to be fully implemented within the OLRT project. This bundling allowed the project team to require completion of an alternative BRT system before closure of the easterly section of the Transitway scheduled for conversion. The Province authorized funding for the Highway 417 project in the amount of \$206 million and the City supplemented the provincial commitment with an additional \$12 million to provide exclusive bus lanes on the widened Highway 417. The City's funding was provided through the Transportation Master Plan (TMP) Supplementary Network approved in the 2013 Budget.

In September 2012, the City received three detailed proposals with developed designs from the shortlisted teams. IO's rigorous evaluation procedure was carried out over a two-month period. The submitted proposals were examined and scored on both technical and financial grounds. The result of this process is presented in this report for final Council consideration, including a recommendation to move forward with a contract award.

Please note that throughout this report the terms Preferred Proponent, Proponent, Maintenance Provider, Constructor, Contractor and the actual name of the Proponent are used as appropriate to fit the context in which they are used. All of the above references refer to the joint venture consortium undertaking the contractual work of the OLRT project, otherwise referred to as the Rideau Transit Group (RTG).

## DISCUSSION

### **A. REBRANDING THE OLRT PROJECT TO THE “CONFEDERATION LINE”**

The OLRT project is Ottawa’s most significant infrastructure investment since the building of the Rideau Canal. The east-west alignment and the location of the Downtown East station bring the project to the very doorstep of the Parliamentary Precinct. The project’s thirteen stations and the connectivity it provides to Ottawa symbolically mirrors Canada’s own development as a nation through the federal government’s investment in national railways to bring together the country. Furthermore, the project’s construction schedule will see the downtown portion of the project substantially complete in time for our country’s 150th anniversary of Confederation.

In recognition of all these facts and as a reflection of the importance of this project to our nation’s capital, this report recommends that the OLRT project be named the “Confederation Line” during the construction period. Once construction is complete, OC Transpo and the Transit Commission will determine the name of the line during its operation that will consider wayfinding and integration into the entire transit system.

This bilingual name reflects the unique nature of the project and its placement through the heart of our federal institutions. In addition to the line naming, the City has required RTG to prepare the system to play an active role in our sesquicentennial celebrations on July 1st, 2017. This will include having downtown stations available for tours, as well as making light rail vehicles accessible for display and available for tours of a segment of the line.

### **B. PROCUREMENT AND EVALUATION**

#### ***1. The Procurement of the Confederation Line***

In May 2011, as part of the [“Procurement Option and Schedule Acceleration Report”](#), and again in the July 2011 [“OLRT Implementation Report”](#), Council directed staff to procure the integrated construction and long-term maintenance and service of the OLRT project as a DBFM project.

This procurement model requires each shortlisted private sector team to advance project designs to a level sufficient to provide a fixed price to construct the system, including a private financing component of at least \$300 million in invested capital, and to maintain the resulting system for 30 years. This approach ensures the private sector contractor has money at risk by tying payments for both financing and maintenance to performance. Failure to provide service at the required levels results in reduced payments, not just for the maintenance service itself, but also on the outstanding financed amount. This discipline forces the private sector team to balance construction cost with the long-term cost of maintaining the system as it will be fully responsible for both, with the financed amount fully at risk. Through this single line of accountability to

deliver and maintain a reliable system based on clear performance and availability standards, an integrated private sector team must organize themselves to drive savings in overall planning, design, project management, construction and over the length of the 30-year maintenance and service agreement.

As mentioned previously, six teams responded to the RFQ. After thorough evaluation, the three strongest and most capable teams received a request to compete to build Ottawa's LRT system:

- **Ottawa Transit Partners (OTP)** led by VINCI Concessions, with ACCIONA Concessions Canada Inc., ACCIONA Infrastructure Canada Inc., Aecon Construction Group Inc., Bombardier Transportation Canada Inc., and VINCI Construction Grands Projets as prime team members.
- **Rideau Transit Group (RTG)** led by ACS Infrastructure Canada Inc., with EllisDon Corporation, EllisDon Inc., Dragados Canada Inc., SNC-Lavalin Capital, SNC-Lavalin Constructors (Pacific) Inc., and Veolia Transportation Services Inc. as prime team members.
- **Rideau Transit Partners (RTP)** led by Bouygues Travaux Publics S.A., with Brookfield Financial Corp., Fiera Axium Infrastructure Canada LP, Parsons Enterprises Inc., Parsons Canada Ltd., Colas Rail S.A. and Johnson Controls L.P. as prime team members.

With the October 2011 release of the RFP, these three teams began a detailed design effort to prepare their submissions. The procurement documents set out comprehensive performance measures that the project must achieve, covering overall system quality, ability to accommodate growing ridership, excellent initial and ongoing bus integration, along with passenger comfort and accessibility. Requirements were set that the stations be designed to ensure neighbourhood connectivity, quality of materials, excellent aesthetics and to achieve compliance with the project's specifications. These specifications were carefully set and refined throughout the procurement process to ensure that the resulting system would fully meet community needs, Council expectations and the requirements of the NCC for Federal Land Use Approval. The specific requirements were focused on ensuring system performance and achieving the desired project outcome, while maintaining the flexibility necessary to allow creativity and innovation in the design so as to achieve the fixed-price identified by Council.

To ensure clear terms and rapid financial close upon selection of the winning bid, the proposal documents contained a complete Project Agreement that the private sector teams committed to as part of submitting individual bids. The Project Agreement was reviewed and refined for clarity through multiple workshops with each competing team. The refined Agreement and all terms are the basis of each bid team's clear obligations, making it possible to move quickly to design and construction upon Council's decision without lengthy negotiations.

In addition to the required output specifications, the procurement also built in a series of incentives and disincentives to drive bidders to strive for even higher performance on some key issues identified by the Mayor and Council. For example, specifications were established to provide the required incentives to the bidding teams to design a system

with lower energy consumption and lower operating costs and to stand behind their projections for over 30 years. Incentives were also included to ensure that the teams produced a construction plan which ensured that mobility was maintained during construction. The bidding teams were also strongly incented to take on full risk transfer with respect to tunnel/station construction.

## **2. Evaluation Process**

The three proposals were evaluated and scored through a highly structured and rigorous evaluation framework based on IO's procurement model with specific criteria developed by the Preliminary Engineering team, IO and staff at the Rail Implementation Office (RIO) and OC Transpo. The Preliminary Engineering team was comprised of experienced individuals with specialized LRT knowledge who developed the reference design presented to Council in July 2011. This team of private sector experts, Capital Transit Partners (CTP), is made up of staff from Morrison Hershfield Limited, Jacobs Associates Canada Ltd, STV Canada Consulting Inc., and URS Canada Incorporated.

RIO and CTP staff, along with staff from IO, evaluated every aspect of each RFP submission against the performance and quality requirements set out in the procurement documents. The project's procurement and overall implementation was overseen by the City's OLRT Executive Steering Committee, which is up made of senior City staff: Kent Kirkpatrick, City Manager; Nancy Schepers, Deputy City Manager, Planning and Infrastructure; Rick O'Connor, City Clerk & Solicitor; Marian Simulik, City Treasurer; John Manconi, General Manager, Transit Services; and, John Jensen, Director, Rail Implementation. Rob Pattison, Vice President, Transit, and Derrick Toigo, Senior Vice President, Civil Infrastructure, represented IO on the Committee.

Teams of subject matter experts independently reviewed each aspect of all three proposals in isolation from one another to ensure independent and rigorous evaluation. Separate teams studied vehicle performance and characteristics, train control and track design, tunnel construction method and approach, all aspects of station design and functionality and the Maintenance and Storage Facility. Once their work was complete each team was available to support each of the five independent scoring technical team members evaluating the technical submissions (the Technical Evaluation Team).

An independent assessor confirmed that the Canadian content estimates submitted by each bid team were valid. A Fairness Commissioner oversaw and attended throughout the evaluation in their continuing role throughout the entire process.

A separate and distinct financial evaluation team examined the quality and detail of the submitted price and financing package to ensure a direct and accurate evaluation. The Financial Evaluation Team was comprised of knowledgeable individuals from the City's Finance department, PricewaterhouseCoopers and IO.

The technical evaluators were not privy to any information about the price or details of financing. Similarly, financial evaluators were not aware of the technical submissions. Evaluators were not allowed to discuss with one another any aspect of the proposals or their impressions, so they could form independent views of each criterion without those

views being influenced by knowledge of financial proposals by the Technical Evaluation Team or technical strengths of the bids by the Financial Evaluation Team.

The evaluations took place in four distinct streams, as described below:

- *Completeness Verification:* Proposals were reviewed by a Completeness Review Team to ensure that the three submissions included all mandatory information.
- *Compliance Review:* A separate Compliance Team undertook a detailed review of each team's design to ensure it complied with the requirements of the RFP and output specifications.
- *Technical Evaluation:* The Technical Evaluation Team was made up of subject matter experts on project design and engineering.
- *Financial Evaluation:* The Financial Evaluation Team was made up of subject matter experts on Alternative Financing and Procurement (AFP) as well as public and private financing.

The evaluators individually undertook a detailed examination of each project component and came to independent scores. Subsequently, all the evaluators discussed their individual scores and established a consensus view of each element resulting in a global technical score.

Following the completion of Technical and Financial scoring and approval of the recommendations by the OLRT Executive Steering Committee, the highest ranking proponent was then invited to begin negotiations with the RIO and IO to finalize and address any outstanding issues or required clarifications. The recommendation to Council on the Preferred Proponent and contract award set out in this report is the result of this process.

### **3. Fairness Commissioner Observations and Findings**

As noted earlier, the entire procurement and evaluation process was overseen by fairness commissioners from an experienced team of Fairness Monitors from PPI Consulting. Present throughout each phase of the process, they have certified that the DBFM RFP procurement process was clearly established in the implementation guidelines (RFP and RIO/IO Evaluation Framework). The evaluation process and criteria described in the procurement documents were applied consistently and equitably. They have certified final evaluation discussions, confirming that evaluators demonstrated diligence in their responsibilities, that they were able to support their individual evaluation assessments and that they held no bias for or against any private sector team. Conflict of Interest and Confidentiality were treated with the highest regard throughout the process. Attestation of no Conflict of Interest was reconfirmed by those participating in the evaluation stage of the process and new participants to the process were also required to sign Conflict of Interest attestations. There were no unresolved issues at the RFP stage of the procurement.

As the Fairness Commissioner for the DBFM RFP for the OLRT and 417 Project (RFP #OILC-11-00-P006), issued by the Rail Implementation Office, PPI Consulting certified

that the principles of openness, fairness, consistency and transparency have been properly established and maintained throughout the entire process.

**C. RIDEAU TRANSIT GROUP SUBMISSION**

**1. *Introduction of Rideau Transit Group***

The evaluation process resulted in the selection of Rideau Transit Group (RTG) as the recommended Proponent. RTG brings together the capabilities and expertise of ACS Infrastructure Canada Inc.; SNC-Lavalin Capital, a division of SNC-Lavalin Inc.; EllisDon Inc; Alstom Group and Thales Group. These companies will form a joint venture not only to build the OLRT project, but to maintain it and ensure the availability of its service for 30 years.

RTG core team members have completed more than 80 large-scale transportation P3 projects and have been awarded more than \$13 billion in work in North America during the last three years. RTG core team members have successfully constructed more than 1,360 km of tunnel and delivered more than 2,500 km of rail/mass transit projects worldwide, including those identified in Table 1 below.

<b>Project</b>	<b>Location</b>	<b>Comment</b>
<b>Canada Line</b>	Vancouver, Canada	On Budget, 110 days early
<b>Seville Line 1</b>	Seville, Spain	On budget and on time
<b>Ankara Metro</b>	Ankara, Turkey	On budget and on time
<b>Barcelona Metro Line 1</b>	Barcelona, Spain	On budget and on time

Table 1: Mass Transit Experience of RTG Members

**2. *Meeting Ottawa’s Transit Challenge***

The challenge, set by City Council and driven by Ottawa’s high ridership and capacity requirements, was to develop a transit system that would meet the City’s transit needs over the long-term while also integrating positively into the fabric of the City.

As outlined in the 2008 TMP, the City’s population and employment growth projections anticipate a 30 per cent increase over the next twenty years. Ottawa’s role as Canada’s capital and its unique landscape and heritage present both challenges and opportunities. To meet Council’s expectations, the system must seamlessly integrate into surrounding communities with links to existing cycling, pedestrian and roadways while enhancing the urban landscape and meeting or exceeding the functional transit requirements for today and future generations to come.

RTG’s proposal meets and is fully responsive to these challenges. From a transit perspective, the system stretches from Tunney’s Pasture to Blair reliably. Travel from one end to the other will be possible in less than 24 minutes, including stops. As well, the system can grow to support train frequency of every one minute and 45 seconds during peak hours.



The proposed station designs will support continued system growth with minimal changes to the system in the future. On opening day, trains will consist of two modular vehicles totalling 98 metres in length, served by surface station platforms 90 metres in length (platforms will service all vehicle doors, allowing several metres at the front and back ends of the train to extend beyond the platform edge). Allowance has been made at surface stations to inexpensively extend platforms up to 120 metres in future as ridership grows. All downtown tunnel station platforms will be 120 metres in length from initial construction to provide maximum future flexibility and avoid any risk of having to undertake costly future station excavation. This approach will allow the system to easily adapt to growing ridership levels well beyond the TMP's 2031 planning horizon.

### **3. System Design and Architecture**

#### ***Design & Architectural Approach***

The Confederation Line must provide an attractive lifestyle choice as well as a transportation option for the community. Stations that are comfortable, intuitive, safe and accessible will encourage ridership and support the City's TMP goals for public transit growth. The exacting standards and requirements resulted in station designs, outlined in the section below that will make transit a truly attractive mobility choice.

RTG's lead design team members have presented a complete guideway design solution that effectively integrates the structural, civil, alignment, trackwork, systems and landscape elements. RTG will deliver all fixed facilities comprising the 13 Stations, Traction Power Substations and the Maintenance and Storage Facility. Further engineering refinements will continue through detailed design in cooperation with the City of Ottawa.

The approach to stations establishes consistent and recognizable architecture (including construction methods and materials) that delivers quality, passenger comfort and resilience while maintaining affordability now and for future extensions. At the same time, each station is tailored to its location in order to integrate well with its surroundings through its own architectural treatment. In this way, the design approach to stations is adaptable and expandable, making it suitable for application to future network extensions. The design concept is a relatively simple one, giving each component (e.g. roofs, elevators, stairs) a strong functional, as well as aesthetic design. The station designs offered in the winning proposal are safe, comfortable, accessible, visually pleasing and functionally efficient.

RTG undertook a thorough analysis as outlined in the project specifications to demonstrate how each station would address Ottawa's weather extremes. Specifically, the analysis demonstrates how the designs would respond to the way in which snow drifts, winds blow and the sun affects each station location.

Each station meets the expectation to create quality public spaces with entrance plazas and easily understood pedestrian circulation. The NCC has been an integral part of the design development process, providing feedback throughout the procurement process. NCC staff support the material choices, designs and architectural approach proposed

and recommend approval to the NCC Board without alteration or conditions. This is important because the NCC controls numerous lands required for construction and must issue Federal Land Use Approvals for the five stations that require transfer of federal lands to the City.

### ***Pedestrian Movement and Accessibility***

The overall design of the stations places strong emphasis on connections and integration with the surrounding communities. Passenger safety, convenience, capacity and mobility were also key principles required in the design of the Confederation Line stations. The concept of Crime Prevention Through Environmental Design (CPTED) whereby the design of public spaces strives to establish a high quality function and aesthetic such that passengers feel safe in every area of the stations, has been an underlying guiding design principle.

Best practices in station design have been adopted to make passenger movements efficient and convenient. Intuitive flow patterns will achieve consistency and familiarity for users, particularly infrequent users of the system.

Performance requirements for primary vertical circulation elements within the stations (i.e. stairs, escalators and elevators) were specified in the performance requirements and RTG had to demonstrate that stations are capable of supporting all expected operating scenarios over the long-term - from the intensity of peak traffic associated with the morning commute, to locating and aligning vertical circulation elements in a manner that best supports the desired destinations and predominant pedestrian movements at each station. At selected stations where special events can lead to large crowds concentrating in short periods, additional consideration was required to provide more generous public plazas where people can congregate so they can move on and off the system safely and efficiently.

Wayfinding within the system has been designed with first time users of the system in mind. From the point of arrival and entry to train boarding at the platform level, the organization of station elements and the sequence of passenger movements have been organized to follow simple and logical progressions. Clear open sight lines as well as the reduction of passenger cross flows and turn back movements are underlying principles of the design that make passenger wayfinding simple and intuitive.

Each station is designed to utilize new or existing pedestrian and multi-use pathways to connect to the surrounding community. These stations are also designed to connect with anticipated future development opportunities along the OLRT corridor, supporting the City's Transit Oriented Development plans.

### ***Integration of Cycling Networks***

Upholding sustainable transportation practices, the Confederation Line has been designed to embrace cycling as the transportation mode of choice for many of its riders. Performance measures required RTG to provide ample bicycle racks, covered for protection from rain and snow. These areas must be well-lit and visible for safety. The

connection to new, planned and existing multi-use pathways will establish vital connectivity between the LRT stations and the City's existing cycling network. It is these connections that will encourage commuters to see stations as cycling destinations and promote cycling as an access option to all Confederation Line stations.

*Vehicle Features for Cyclists* – The vehicles are required to provide bicycle storage onboard during off-peak periods. The vehicles offer level boarding at platforms and ample available space to board, manoeuvre and store bicycles for the duration of a rider's trip.

*Storage Facilities at Stations* – Each station will provide generously lit and covered bicycle rack facilities in sufficient quantity to satisfy the long-term demand for increased cyclist use in the future. More than 300 bicycle parking spots will be provided system-wide, 80 per cent of which are covered. The station plaza areas have been planned so that cycling facilities can be expanded cost-effectively as demand increases. These facilities have been located in prominent areas close to station entrances and within view of most passengers entering and leaving stations.

*Cycling Features within Stations* – Enhanced vertical circulation features have been provided in all stations, specifically to accommodate the cycling community. Double elevators serving each station offer higher levels of service and shorter wait times. The addition of bicycle staircase ramps to the main stairs provides an alternate means for cyclists to access station platforms.

### ***Public Art***

In July 2011, Council approved the artistic themes outlined in the Technical Overview attachment to the OLRT Project Implementation Report. City staff continues to advance the Ottawa Light Rail Art Program and have released two separate RFQs to develop a shortlist of artists for consideration in early 2013.

The first, released in July 2012, shortlisted artists for twelve of the Confederation Line's thirteen stations. The second, released in November 2012, seeks to shortlist Algonquin artists for LeBreton Station. The location of LeBreton Station is of particular significance, as it is in close proximity to Chaudière Falls and Victoria Island, which are sacred Algonquin gathering places. As such, LeBreton Station has been themed "Algonquin" and will incorporate artwork designed and created by Algonquin artists. The City has worked closely with the Algonquins of Ontario on the art program for LeBreton Station and throughout this RFQ process. Specific work has been done to identify ways in which cultural symbols and treatments can be integrated into the station designs.

The City will announce the winners of the two RFQs and commence the final selection process in early 2013, upon completion of the evaluation of the Algonquin RFQ submissions.

### ***Retail in Stations***

Retail spaces have been accommodated at the high capacity transfer stations. Provisions for a minimum of 15 square metres of future retail space have been accounted for at Tunney's Pasture, Rideau, Hurdman and Blair stations as determined by the City and OC Transpo. The provisions include the planning and protection of the appropriate space and a rough-in for mechanical and electrical systems as well as a separate metering point for domestic water.

### ***Fare Control***

OC Transpo will be commissioning, in 2013, a study of fare control strategies for the light rail line and the rest of the rapid transit system. The strategy will need to incorporate the need for easy connections between buses and trains, allowing customers to use fare payment methods of their choice at all locations, and protection of fare revenue by keeping theft of service and trespassing low. The study will examine alternatives such as fare barriers and prepaid areas versus proof-of-payment fare collection. Any fare system will be compatible with both the PRESTO smartcard system and the continued use of cash fares, as each customer prefers. The study will be conducted and completed in 2013, and the findings will be reported to the Transit Commission later in the year, with recommendations regarding possible implementation and next steps.

### ***Downtown Station Entrances***

#### ***Downtown West Station – West Entrance***

All bidding teams were instructed to locate the Downtown West Station - West Entrance on the south west corner of Albert Street/Lyon Street. The entrance and traction power substation would be located on the former Feinstein property purchased by the City of Ottawa. The entrance at this location would be connected to the station via a 90 metre long pedestrian tunnel under Lyon Street to the station platform on Queen Street.

This entrance location was initially proposed as a result of moving the tunnel alignment from Albert Street to Queen Street and the desire to maintain the catchment area of the station to the south of Queen Street.

Following negotiations with RTG, it is now proposed that the Downtown West Station – West Entrance be located on the southeast corner of Queen Street/Lyon Street eliminating the pedestrian tunnel under Lyon Street and the entrance at the Albert Street/Lyon Street location.

This proposed station entrance location has the following advantages:

1. A net capital cost savings can be realized with a Queen Street west entrance location due in large part to the elimination of the north-south pedestrian tunnel to Albert Street. This cost savings is reflected in the financial implications of the OLRT Project as outlined later in this report.

2. The disruption to Lyon Street from the construction of the north-south pedestrian tunnel on Lyon Street can be avoided.
3. The long-term maintenance costs of the pedestrian tunnel on Lyon Street can be avoided.
4. The RIO and CTP teams have come to the conclusion that the tunnel walkway presents issues that are not easily mitigated. The elimination of the pedestrian tunnel on Lyon Street eliminates a potential CPTED issue with the long pedestrian tunnel. The tunnel is a “movement predictor” and exposes OLRT passengers to a predictable path of travel which cannot be avoided. This is not consistent with CPTED principles, which discourage the design of facilities which present an entrapment and personal safety risk.

Overall, the above advantages more than offset the perceived benefits of the north-south pedestrian tunnel and a more southerly entrance location.

### *Rideau Station Location and Opportunities for Integrated Entrances*

The relocation of Rideau Station from its previous location straddling the Rideau Canal to its current location on Rideau Street provides significant opportunities to integrate station entrances into adjacent developments. All bidding teams were constrained in locating the west end of the Rideau Station platform to the east limits of the Rideau Street/Colonel By intersection. As well, they were required to have Rideau Station served by three entrances as follows:

1. Provision for an entrance on the south side of Rideau Street so that the planned redevelopment of the Rideau Centre by Cadillac Fairview could link to the station. Provisions were to be made for a knock-out panel at the concourse level of the station with the remainder of the entrance to be provided by Cadillac Fairview.
2. A minimum of two additional entrances were to be selected from a list of three possible integrated entrance locations: Freiman Mall on the north side of Rideau Street, William Street on the north side of Rideau Street, or William Street on the south side of Rideau Street integrated within the Rideau Centre west of the Freiman Mall axis.

The proposed design locates an entrance on the north side of Rideau Street integrated within the William Street mall. All or part of the ScotiaBank property will be acquired to allow the William Street entrance to be located without any impact on the width of the William Street pedestrian walkway to the Byward Market. This will allow for the relocation of standalone station vent shafts at the east end of the station from the area between the curb and within the property line of the ScotiaBank property and integrated into the entrance building. This arrangement is strongly supported by RIO and City Planning staff and represents a significantly improved urban design that would not be possible if the ScotiaBank properties were unaffected. Two knock-out panels have been designed for possible future connection to the Rideau Centre Expansion. These knock-out panels could facilitate either a shallow tunnel connection under Rideau Street to the William Street stair

and escalator core, or could facilitate a deeper connection to the concourse below direct from the Rideau Centre Expansion.

At the west end of the station, Cadillac Fairview has proposed an entrance that will involve a series of cascading escalators and stairs from the north-western corner of the Rideau Centre at Sussex and Rideau. This entrance will be constructed within the Rideau Centre at 10 Rideau Street taking advantage of the high pedestrian traffic and high profile of this location within the City. The cascading stairs and escalators will descend in an easterly direction to the station concourse below. Additionally, a double elevator bank will be constructed within the Rideau Centre in proximity to the current Freiman Mall entrance. This elevator bank will connect the ground floor level of the mall to the station concourse below and also extend up to the level of the existing overhead walkway, connecting The Bay on the north side of Rideau Street.

#### *Downtown East Station - Possible Connection to the National Arts Centre (NAC)*

As outlined in the April 25, 2012 Council Memo: *Response to Council's Motion Downtown East Station Shift: Feasibility Study on NAC Connection to Downtown East Station* and, in response to Council's direction to study the feasibility of shifting the Downtown East station further east towards Metcalfe Street, an innovation zone was established to encourage the bidding teams to position their station further east if feasible and cost-effective.

In the design review meetings with the bidding teams it was determined that a shift of the station further east would necessitate a deeper, and consequently more expensive station, as the tunnel at that point is descending in order to pass under large sewers on either side of the Rideau Canal. Furthermore, after detailed review, it was determined that the station at its more westerly location had two significant advantages:

1. Better bus operations as it allows buses to turn south at O'Connor Street rather than Elgin Street; and,
2. The integration with the Sun Life building affords direct access to Albert Street and avoids a possible station entrance placement in the Queen Street right-of-way.

Council further directed staff to examine the feasibility of a weather-protected connection from the Downtown East Station to the NAC. It was determined by the NAC that such a connection cannot occur through the existing tunnel under Elgin Street to the NAC parking structure. As a consequence of both the requirement of a deeper station and the lack of access to the parking structure, it was determined that a direct connection was cost prohibitive. The City then began to explore alternative connection opportunities for the NAC, including a potential covered connection along the Mackenzie King Bridge to the Ottawa Convention Centre and Rideau Centre and the station located therein. Staff will continue to pursue this option with the NAC.

#### **4. Capacity to Grow to Meet Long Term Demand**

The Confederation Line has been designed to provide an initial ridership capacity of approximately 10,700 people per hour per direction (pphpd). Depending upon growth within the City and the expansion of the transit network, it is anticipated that ridership on the line will grow to approximately 18,000 pphpd by 2031. Ultimately, the system is designed to enable expansion to accommodate an ultimate ridership of 24,000 pphpd.

The bidding teams were required to demonstrate that they had designed their stations and vertical circulation to support ridership upon commencement of revenue service. They were also required to provide vehicle and platform design that could easily support ridership growth to 2031 and demonstrate modest and low-cost platform expansions and vehicle/system solutions to meet ultimate-system capacity.

The RTG proposal provides this capacity by providing a two-vehicle, 98-metre long train whose doors are accessible within the 90-metre long surface platforms. Once ridership rises above the 2031 level, the surface platforms can be easily lengthened at the surface stations to accommodate a variety of future operating scenarios and train lengths. The expandable platforms at surface stations can support a variety of possible approaches to adding long-term capacity including the possibility of future orders for longer vehicles combined into longer trains. All vertical circulation elements within stations have been sized for the ultimate capacity of the system. The three downtown underground stations are designed from opening day with a 120 metre platform to avoid any potential for costly excavation in the future. Public and emergency circulation elements have also been sized for these ultimate ridership volumes.

#### ***Right Sizing the Light Rail Vehicle Fleet***

The initial vehicle purchase has been sized to meet the expected demand between today's peak demand of approximately 9,300 pphpd and the anticipated opening day peak demand of 10,700 pphpd. Because such projections are long-term in nature and based on City growth scenarios that are difficult to accurately predict into the future, the RIO built into the procurement process, vehicle options that allow the City to purchase additional vehicles to right size the fleet and provide for growth beyond what is currently anticipated. These vehicle options allow the City to elect to purchase up to six (6) additional vehicles in each year (three full train sets) for seven years after the contract is signed with price certainty – including the ability to do a one-time increase to our vehicle order within 18 months of system opening at the vehicle bid price. This will provide the City with the right to adjust the size of the fleet during the construction period and during the first two years of operation with predictable and stable pricing for the purchase of any additional vehicles.

With the inclusion of a vehicle option, the price of future vehicles is fixed based on the competitive price received during the bid process. Any extra train sets purchased under this option in the first three years will be provided at the same price as the base bid vehicle costs. Vehicles purchased after the first three years are based on the original price set during the procurement, but are subject to an inflation factor tied to a basket of

inflation measures. This requirement will provide full flexibility to adjust fleet sizes in the event that ridership grows faster than projected.

## **5. Bus Rapid Transit / O-Train Connectivity**

The two Confederation Line terminus stations (Tunney's Pasture and Blair) will function as transfer nodes where passengers from outlying areas will transfer between Transitway and LRT modes. The design of these stations, as well as the Hurdman and Bayview stations, takes into account their important role as links with the City's bus network and the O-Train. The stations have been configured to respond to predominant passenger movements between the station and the bus loop or O-Train. Transfer movements have been optimized by providing dedicated station entry points for Transitway or O-Train passengers, enabling transfers without passing through fare control barriers and revalidating fare payment. The escalators in these transfer stations (as well as all other stations) are based on a "heavy duty" specification recommended by the American Public Transportation Association (APTA) to ensure high availability in all seasons and the ability to function reliably in the long-term even when exposed to snow and salt.

### ***Tunney's Pasture Station and Bus Loop***

At Tunney's Pasture Station, a new bus loop and approach ramp are located just north of the station, providing fast and direct access for buses coming from the Transitway to service the station. Provision of a bus loading and unloading zone in close proximity to the station entrance reduces walking distance and improves passenger convenience.

Tunney's Pasture Station has been organized as a large, single, central concourse with four entry points oriented to serve the bus loop, the office campus to the north and the local residential and business community destinations to the south. Passengers entering the station will cross the concourse area and take stairs, elevators or an escalator to the platform level below where trains are waiting.

### ***Blair Station and Bus Loop***

At Blair, the existing Transitway station will be converted to a centre platform LRT station where Transitway traffic will be directed to an expanded and segregated bus loop.

At the station platform level, new vertical circulation elements from the platform to the concourse level below will allow passengers to transfer quickly and efficiently to the bus loop level. Similar to Tunney's Pasture, the bus loop allows passengers direct transfer from bus to LRT, and vice versa, without passing through fare control barriers or revalidating fare payment.

Passengers arriving at the station from south of Highway 174 will access the station via the existing pedestrian bridge. A new entry concourse constructed at bridge level on the east side of the bridge provides all the ticketing functionality and access needed for



non-bus passengers to access the station. New stairs, escalator and elevators provide the necessary amenity and function to access the LRT platform.

### ***Hurdman Station***

At Hurdman Station, the new elevated station will serve as the primary transfer point with the Southeast Transitway and will act as a 'gateway' to the future development to the north. A new bus drop-off and parking area will enable passengers to transfer between the Southeast Transitway and the LRT and vice versa without passing through fare control barriers or revalidating fare payment.

The bus drop-off and transfer concourse, main entrance plaza, surrounding sidewalks and connections to the multi-use pathways will provide pedestrians and cyclists with convenient access to the transit system. The station's functional plan responds to primary passenger movement between the pedestrian concourse at grade and the station platforms above.

### ***Bayview Station***

Bayview Station is located directly over the existing O-Train platform and is designed to facilitate existing and future O-Train operations. The station provides a direct and efficient vertical connection between the OLRT and the O-Train platforms.

Bayview Station is designed to facilitate passenger transfers between the existing O-Train and new LRT without passing through fare control barriers or revalidating fare payment. The station's functional plan responds to the predominant passenger movements between the two platforms and the Albert Street entrance. Pedestrian connections are enhanced by continuing and completing the pathways to and from the surrounding community.

Provisions have been made to accommodate future double tracking of the O-Train line, including the addition of a new platform on the east side of the current track with vertical circulation elements.

An overview of the design of each station is outlined in Appendix 1.

## **6. Highway 417 Widening**

In March 2012, Council directed staff to execute an agreement with the Province of Ontario to combine the OLRT Project with the Province's Highway 417 widening project - from Highway 174 to the Nicholas Street on-ramp. The City of Ottawa requested that this project be fast-tracked to enable an alternate dedicated transit route during the construction of the Confederation Line that would reduce the need to incur additional operating costs to provide bus service that would be required with the removal of the Transitway. The newly constructed lanes on Highway 417 will be used exclusively to carry bus traffic that is displaced during the construction period by the conversion of the Transitway to LRT.

The bundling of the two projects together also provides ancillary benefits and has helped to reduce costs and shorten the overall project schedule. In addition, it affords RTG full control of both project schedules and allows the City to hold a single party responsible for performance on the Highway 417 widening and Transitway conversion.

The City of Ottawa and the Ministry of Transportation (MTO) are anticipating entering into a project agreement outlining their respective rights and responsibilities for the Highway 417 widening project. As it is a build-finance project, the project design was advanced to 100 per cent and full construction can begin in early 2013, ensuring access to the additional transit priority lanes in time for the planned closure of the Transitway. Some of the enabling pier work in the Rideau River was advanced by the MTO and is currently underway to ensure that pier work could be completed prior to spring seasonal restrictions for water construction. For more details on the Highway 417 construction please see Appendix 2: OLRT Construction Schedule.

## **7. The Light Rail Vehicle and Train Control System**

The vehicle and train control systems in RTG's proposal — Alstom's Citadis 100 per cent Low Floor Light Rail Vehicle and Thales' SelTrac Communication Based Train control system — are world class and service proven.

### ***The Providers***

Alstom Transportation is a large and experienced global train manufacturer that generated more than \$8 billion in revenue last year. Alstom also has significant experience successfully providing a range of transit vehicles in service across North America. In Canada, the company has division offices in Ottawa, Montreal and Toronto.

Similarly, Thales is a proven provider of the Seltrac train control system and other systems in aerospace, transit and defence. In 2011, the company generated revenues of \$17 billion with 67,000 employees in 56 countries. In Canada, Thales has been operating for more than 30 years, employing 1,300 people in its Transportation, Defence & Security, and Aerospace sectors. Canada is also headquarters to Thales Centre of Excellence with offices in Ottawa, Toronto and Vancouver that employ more than 800 people. Thales' systems are in operation with major operators worldwide, including those of Vancouver, London, New York, Shanghai, Hong Kong and Dubai.

Alstom and Thales have a proven track record of working together to successfully integrate their infrastructure on several joint transit projects, including the London Underground Jubilee Line and Shanghai Metro Lines 6 and 8.

### ***Train Control System Overview***

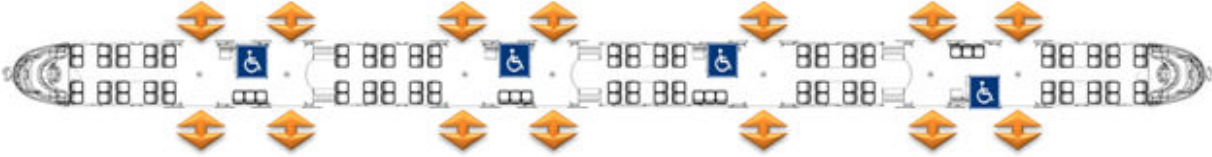
Thales first deployed the Communications Based Train Control (CBTC) signalling solution offered in RTG's proposal on both Toronto's Scarborough RT and Vancouver's Skytrain systems. Today, similar CBTC technology has become the *de facto* standard for urban rail systems. There are more than 35 systems equipped with the SelTrac CBTC system with more than 10 million cumulative hours of operation.

**Vehicle Overview**

Since the introduction of the Citadis family of vehicles by Alstom in 1997, more than 1,500 Citadis Light Rail Vehicles (LRV) have been sold worldwide in more than 40 cities, accumulating more than 245 million km in service. The Ottawa Citadis vehicle is designed for cold and heavy snow climate operations and can achieve the required end-to-end trip time in less than 24 minutes, including stops at stations. The vehicles will be assembled in Ottawa at the OLRT Maintenance and Storage Facility to comply with the Canadian Content Requirements as set out by the provincial government.

The vehicle is 49 metres long, with two vehicle trains operating during the day on opening day and one vehicle in operation in off-peak periods in the late evening. The longer vehicle provides end-to-end visibility and line of sight within the vehicle interior which enhances passenger safety and accessibility. The vehicle has 120 seats with capacity for another 180 standing, bringing total vehicle capacity to 300 (based on specified passenger comfort level of 3.3 people per m<sup>2</sup>). Each vehicle includes four designated wheelchair areas for accessibility.

*Figure 1: A single Citadis Vehicle*



The Citadis is an exceptionally energy efficient vehicle and is 95 per cent recyclable. Its efficiency contributed to the RTG systems energy efficiency that uses half the energy of the reference design produced by the City’s preliminary design effort. This is due in large part to features such as its regenerative braking system, single-stage gearbox, low consumption LED interior lighting and a 98 per cent efficient electric drive system. Furthermore, the vehicle is designed to meet low noise performance standards both inside and outside of the train.

**Climate Related Vehicle Features**

Alstom has a wealth of experience in climates similar to Ottawa’s seasonal variations, including experience in manufacturing vehicles for environments with heavy snow and extreme cold conditions in alpine and Nordic countries such as France, Sweden, and Finland.

Specifically, the Citadis is designed for challenging climatic conditions similar to Ottawa, including:

- HVAC – Air conditioning will respond to high summer temperatures and humidity levels.

- *Extreme cold temperature* – The vehicle systems have proven reliability in terms of their electronic, pneumatic and hydraulic equipment and their ability to maintain comfort in passenger areas. Heating will be located at floor level to prevent snow or ice accumulation within the interior of the vehicle and by the roof-mounted HVAC units to ensure passenger comfort. Door thresholds are also heated to prevent ice and snow accumulation.
- *Snow* – The vehicle systems have a proven capacity to operate in heavy snow that can impact filtration at air intake, cause roof and underframe accumulation, and can affect driver visibility.
- *Ice formation* – The vehicle is capable of dealing with ice formation that can cause improper operation of unprotected moving parts such as doors or the pantograph (the connector between the overhead wire and the vehicle).
- *Ice/snow removal* – The vehicle is service proven even with the presence of salt, glycol or other products used to deal with snow on roads, walkways or vehicles that can cause corrosion.
- *Condensation* – The vehicle is designed to prevent condensation that could impact interior comfort conditions and visibility.

### ***Accessibility Features of the Vehicle***

The Citadis vehicle is one of the most accessible vehicles in the world. The vehicle interior is designed with a 100 per cent low-floor passenger area and seating arrangement to provide full accessibility, using both ADA (*Americans with Disabilities Act*) and AODA (*Accessibility for Ontarians with Disabilities Act*) as a best practice reference to meet or exceed the relevant accessibility standards. The vehicle is equipped with seven dual leaf, 1,300mm wide passenger access doors per side to optimize passenger accessibility and reduce the time it takes for passengers to enter/exit the vehicle under peak operating conditions.

The vehicle provides a continuous unobstructed path connecting all accessible elements and spaces of the vehicle. All thresholds are equipped with a colour band running along the full width that contrasts with the step tread and is adjacent to the floor. The vehicles are equipped with a levelling system that can ensure platform alignment to the vehicle floor to ease wheelchair and passenger access.

All signs are bonded on the train with the International Symbol of Accessibility and are displayed on the exterior of each vehicle. The doors use auditory and visual warning signals to alert passengers when doors are closing. As well, each vehicle contains signs that indicate which seats are priority seats for persons with disabilities.

All passengers have access to push buttons for access-door opening requests or to communicate with onboard staff in an



emergency. Provisions are made to integrate these push buttons according to ADA/AODA requirements:

- Located to be accessible by passenger in wheelchairs.
- Contrast with the internal fitting on which they are mounted, a push button allows passengers to request the automatic opening of the adjacent passenger door at the next station. This allows passengers in wheelchairs to request door opening at the next station before arriving at a station, allowing time to exit out of the train comfortably.
- The handrails in the vehicle are sufficient to permit safe boarding, onboard circulation, seating and standing assistance, and alighting by persons with disabilities. The vehicle is equipped with grab bars, handholds, handrails or stanchions.

## **8. Power Supply (Temporary and Permanent)**

**Permanent power** will be fed from the Hydro Ottawa's distribution system across the Confederation Line alignment through the use of nine (9) different Hydro Ottawa substations.

**Traction Power Substations (TPSS):** There will be a network of eight (8) substations along the alignment and two (2) at the Maintenance and Storage Facility (MSF) feeding Direct Current (DC) power to the vehicles. The traction power system has been designed to allow for continued operation in the event of a single transformer failure.

**Temporary Construction Power:** Five (5) temporary construction power supply points are being made available to support construction activities at key locations across the project.

The received High Voltage Alternating Current (AC) from Hydro Ottawa will be rectified to DC 1500V at the Traction Power Substations. The power will then be distributed across the alignment via an Overhead Catenary System (OCS) allowing the vehicle to collect the power from the contact wire with a pantograph. The 1500V DC system has the benefit of an efficient distribution of power and results in less voltage drop between Traction Substations and a reduction of current flows. The pantograph power collection is an established technology, which is proven in the operational and climatic performance requirements of the Project.

A Utility Infrastructure Works Letter of Agreement is being negotiated with Ottawa Hydro Limited to design and construct infrastructure work required for the OLRT project. The Agreement will provide for the reserving of required electrical power capacity along with the design, construction and installation of wiring, cables, fibres, electrical equipment and all ducts, chambers, conductors, transformers, switching gears, poles and other material, and equipment necessary to supply power to the Supply Points as detailed in the Hydro Ottawa Limited OLRT Planning Reports, to support the construction and operation of the ORLT.

## **9. Maintenance and Storage Facility (MSF)**

The MSF will be located on an approximately 16 hectare site on the north side of Belfast Road just east of the crossing of Belfast Road over the VIA Rail right-of-way. The MSF site will be comprised of two structures: the Vehicle Storage Shed and the Administrative /Maintenance Facility.

The connection between the MSF and the main Confederation Line alignment features a below grade connection beginning in a tunnel north of Tremblay Road at Belfast Road and continuing into the MSF site under the VIA Rail tracks. It is a strict requirement that all construction infrastructure (including items such as tie-backs) must be located within the currently-owned land without encroaching on any residential properties.

The MSF design provides for the required maintenance and operating procedures for the LRT system. The design delivers an efficient work environment that ensures proper traffic access, materials handling and workflow. Yard and shop circulation routes for vehicles minimize train movements within the yard. The design provides unimpeded access to vehicle sanding and washing, cleaning and inspection, heavy maintenance, wheel truing, maintenance-of-way vehicles and storage yards.

Vehicle movement in the Maintenance and Storage yard will be conducted using the automated train control system built into the vehicles and train control system. Onboard staff will have the trains brought to them from storage under computer control and delivered to the main line once onboard. The automatic train control system will enable efficient and organized vehicle maintenance and cleaning without the need for onboard staff to move vehicles around off hours when these activities will occur.

The MSF site design takes into account initial requirements but will also accommodate expansion, with areas designated for future vehicle storage, a paint shop, and eventual MSF building expansion. The design complies with local regulations, building codes and standards related to accessibility for persons with disabilities. The MSF building design will also achieve LEED Certification.

**C. PROJECT CONSTRUCTION AND MAINTENANCE PERIOD COSTS**

The RTG capital cost submission, outlined below, meets the budget established by Council with the fixed price contract and full risk transfer.

**1. Confederation Line Construction Budget**

<b>Project Budget July vs. Current (Millions)</b>		
	<b>July Estimate \$M</b>	<b>Current \$M</b>
<b>Property, Engineering, Project Management (City works)</b>	<b>397</b>	<b>275</b>
<b>Tunnel &amp; Stations</b>	<b>777</b>	<b>681</b>
<b>Track work/ Systems/ M&amp;S Facility</b>	<b>442</b>	<b>551</b>
<b>Civil Works</b>	<b>174</b>	<b>102</b>

<b>Vehicles</b>	<b>325</b>	<b>344</b>
<b>Financing &amp; Transaction Costs</b>	<b>N/A</b>	<b>177</b>
<b>TOTAL</b>	<b>2,115</b>	<b>2,130</b>

**Table 2: Proposed Construction Costs**

## 2. Operations, Maintenance and Capital Rehabilitation

The cost of operating, maintaining and providing for the lifecycle rehabilitation of the system for 30 years is a very important element in the delivery of a sustainable transit system. This initial leg of what will be the overall LRT system with future extensions carries with it certain one-time costs that are necessary for an expanded system. Elements such as the LRT control centre and a back-up control centre, which will serve future LRT extensions, make the initial project more expensive to build than subsequent phases.

By 2021, the Confederation Line will produce a net savings of \$16M a year versus attempting to provide the equivalent bus service through the downtown. The \$16M in annual savings will grow as ridership increases, given that the system provides significantly greater capacity at a lower unit cost than is possible with buses.

The bus service hours saved immediately in the near term will address the fastest growing pressure on the OC Transpo budget: the downtown bottleneck which limits speed and quality of service to the public and hinders the ability to improve system productivity and efficiency. The effect of slower speeds and congestion through this downtown bottleneck has already begun to drive up overall system costs. Further, productivity gains and lower cost per passenger-kilometre travelled can only be achieved by providing a higher capacity system through the downtown. As each future LRT extension comes online, the efficiency of the whole LRT system will become more apparent.

The new Confederation Line will satisfy ridership growth at a lower cost while providing a higher quality of service through the downtown. This will reduce ongoing costs to the system while ensuring robust maintenance and capital rehabilitation. RTG's submission outlines costs that match the estimate provided to Council in July 2012, while complying with a rigorous maintenance and service program designed to keep the system in excellent working order when the hand back occurs to the City after the 30-year maintenance and service term.

<b>O&amp;M Costs July vs. Current</b>		
<b>Cost Area</b>	<b>July Estimate (annual)</b>	<b>Current (annual)</b>
<b>Train and Infrastructure Maintenance</b>	<b>23</b>	<b>28</b>
<b>Operations - Driver Labour</b>	<b>5</b>	<b>4</b>
<b>Operations - Energy</b>	<b>7</b>	<b>3</b>

**Table 3: Operations and Maintenance Costs****3. Local Economic Impact**

It is anticipated that the construction of the Confederation Line will generate over 3,200 direct person-years of trades' employment in the Ottawa area. Skills employed will encompass the full spectrum of construction trades including road building, civil works, tunnelling, track work, and bridge work; structural, architectural, electrical and mechanical work. Expertise in systems and communications will also be required. Highly skilled technical staff will be hired, leading to an additional 700 person-years of employment in Ottawa. Also, 375 person-years of engineering employment will be created. These direct jobs will create a multiplier effect in the local economy, which is anticipated to generate over 20,000 people years of employment in indirect or induced impact over the construction period.

As required by the City, RTG will report the local employment numbers on a monthly basis. The Trade Show organized by the City in February 2012 provided the RTG and the other private sector bidding teams with a unique opportunity to meet local suppliers, educational institutions and representatives of the Algonquin's of Ontario. Through their participation in the trade show and subsequent contacts, and based on their extensive experience in construction in the Ottawa region, RTG will rely on a network of local relationships to carry out its contracting and recruitment.

RTG is proposing a vehicle that will achieve over 25 per cent Canadian content in three ways: first, from the resources of Alstom, the vehicle supplier already established in Canada; second, through local sourcing; and finally, through final vehicle assembly to take place in Ottawa.

To assemble the vehicles in Ottawa RTG will hire:

1. Approximately 75 people for about two years, on a production line to complete manufacturing, assembly and testing of the vehicles;
2. Approximately 15 people for about three years on vehicle warranty/quality control; and,
3. A management team of approximately 10 engineers.

Maintenance of the vehicles will also create approximately 50 permanent jobs in Ottawa.

As they have done successfully on past projects, RTG will work with Ottawa area universities and colleges to develop opportunities for students to work on the project, providing essential practical experience on a large and complex project.

**D. CONSTRUCTION METHODOLOGY AND SCHEDULE****1. Construction Methodology**



The proposed construction methodology and schedule is focused on having the system in operation as early as possible while minimizing mobility impacts during construction. The RTG construction plan responds to the incentives in the procurement to minimize disruption during the construction period. The tunnel will be constructed through three entry points: the east portal, the west portal and a central shaft site at the intersection of Queen and Kent Streets. The stations are proposed to be mined with minimal surface impacts. By avoiding “cut and cover” construction methods, much of the tunnel and station construction will occur underground, so as to be nearly undetectable at surface level. Instead, the more noticeable surface construction impacts on Queen Street will result from the construction of the Queen Street watermain replacement, in addition to the mining of the entrances to the stations and ventilation shafts from the surface and from below and at the central tunnel shafts located outside the Queen Street right-of-way. The proposed construction methods will ensure that vehicles and pedestrians can continue to access buildings on Queen Street.

The sequential excavation mining techniques being employed allow for the management of noise and vibration during construction. Day-to-day life on the surface will continue as normal without appreciable change as mining goes on under the roadway.

The construction schedule retains a high degree of flexibility, reducing the risk of delays and facilitating schedule recovery as needed. Schedule buffering is also an important part of creating the full tunnel risk transfer to RTG. At the same time, it may be possible to complete the project more quickly should these buffer times prove unnecessary and downtown tunnel mining productivity is completed as expected. Construction during the winter months is a constraint for some activities, so scheduling has been developed taking cold weather construction into consideration.

RTG has conducted full due diligence and planning into minimizing disturbance to transit service levels, local traffic and surrounding homes and businesses in the vicinity of the planned detours. Work will continue with the Transit Commission and Transportation Committee, as well as the public and affected stakeholders to further refine these plans before major construction commences. Schedule, logistics planning and detailed design efforts will enhance current plans as RTG works with City staff throughout the project.

The critical path as shown on RTG’s schedule will provide valuable insight into construction progress and will identify the need for recovery strategies in the event of unforeseen delays. This early warning is crucial to identifying issues and providing the opportunity to mitigate the long-term impacts of those issues on the overall implementation of the project. It remains the sole responsibility of RTG to manage all construction risks (including schedule), although the City retains some risks related to property acquisition and permits and approvals.

## **2. Traffic and Transit Management**

During construction of the Confederation Line, road closures will be required at several locations to permit the construction of certain elements of the system. It should be noted that all proposed road closures are subject to confirmation and approval as part of the overall Traffic and Transit Management Plan (TTMP).

Booth Street will be closed for a period of time to permit construction of Lebreton Station, with a detour route provided by a temporary northerly extension of Preston Street from Albert Street to Wellington Street. Belfast Road south of Tremblay Road will be closed to permit the construction of the tracks to the MSF. Nicholas Street between Rideau Street and Besserer Street will be closed to provide for construction-related activities associated with Rideau Station.

Lane reductions are planned for construction at various stages of these works. All such reductions will be required for the shortest period possible. From 2016 to 2018, two of the four general traffic lanes on Scott Street and Albert Street, from Holland Avenue to Empress Avenue will be converted to transit-only lanes. Beginning early in the project, sections of Queen Street between Lyon Street and Metcalfe Street will be subject to lane reductions and potentially short-term closures, with local access to be maintained at all times. As well, Rideau Street between Sussex Drive and Dalhousie Street will be reduced to three lanes, with transit-only lanes in each direction, and one westbound lane for general traffic, with eastbound traffic detoured. Lane reductions will be required (2013 to 2018) on Laurier Avenue between Nicholas Street and Waller Street to accommodate transit in the vicinity of Laurier Station. In 2016, one northbound lane of Nicholas Street from Highway 417 to Laurier Avenue will be converted to transit, while sections of one of the southbound lanes on Nicholas Street from Laurier/Waller south to Highway 417 will be reserved for transit only.

Permanent road width reductions are proposed on Belfast Road, between Tremblay to the Trainyards, where the existing four lanes will be reduced to two, and on Queen Street, where the existing cross-section will be reduced, subject to detailed design.

All road construction projects planned to occur over the next six years have been reviewed and schedules adjusted where possible, to minimize overlap and to mitigate traffic impacts. Monitoring will take place throughout the construction period, with measures implemented to mitigate any traffic issues to the extent possible.

### **3. Highway 417 Construction Schedule**

Work on the Highway 417 widening will commence in the spring of 2013 with completion by the summer of 2015. The Lees/Vanier/Belfast structures will be temporarily closed for structural replacement using self-propelled modular transporters (SPMT's), a proven method for rapid bridge replacement. Lees Avenue will be closed for up to 12 weeks to allow for bridge replacement. The existing structure is a multi-span bridge which will be replaced by a two span centre to median pier arrangement while keeping the existing end abutments.

An overview of the OLRT project schedule/key milestones is outlined in Figure 2.

## Ottawa Light Rail Transit – Phase 1 Construction Schedule

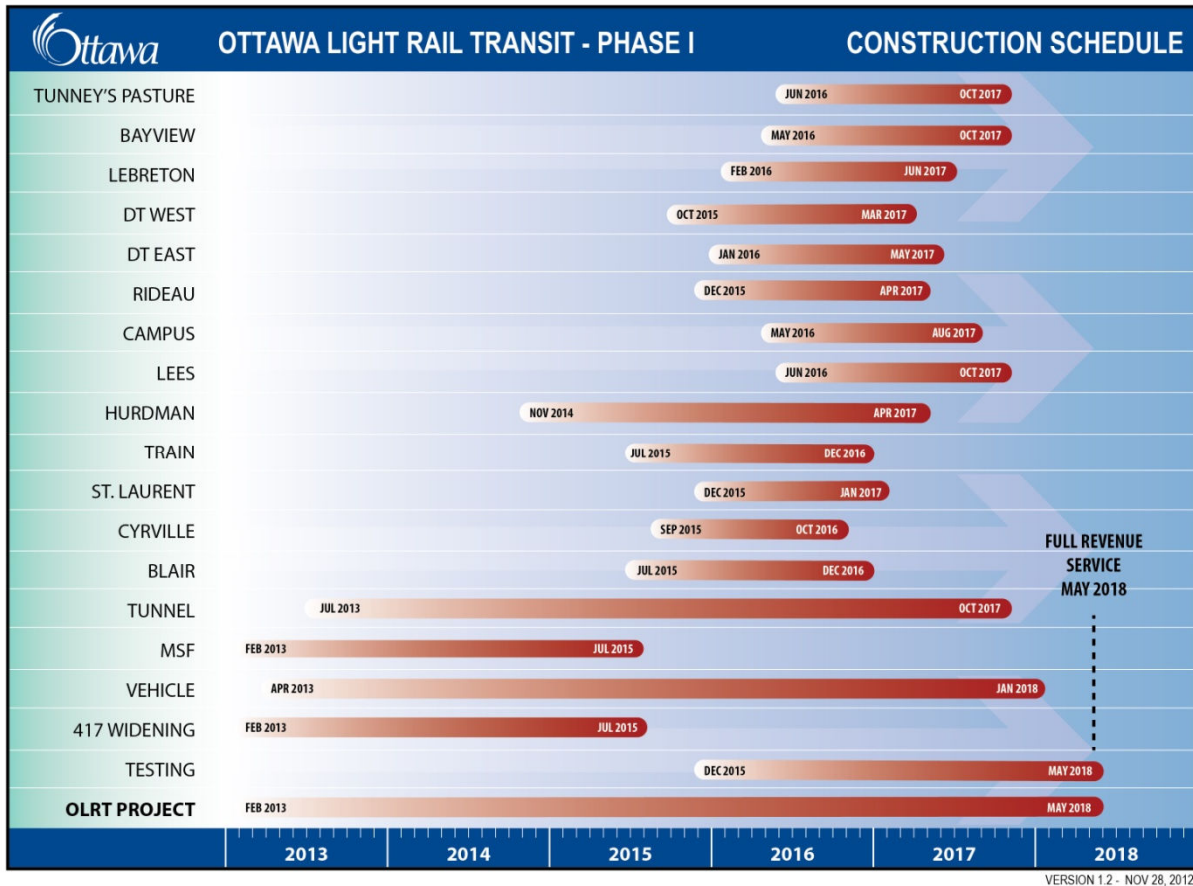


Figure 2: OLRT Anticipated Construction Schedule

### 4. Construction Material Management

RTG's design and construction methods will minimize excess excavated material generation and maximize re-use of excavated material on the Project. Procedures for excess excavated material management for the Project have been developed to meet best practices and are compliant with environmental laws (e.g. *Ontario Environmental Protection Act, Canadian Environmental Protection Act*).

The environmental properties of the excavated materials generated during tunnel construction will be determined to identify how this material will be re-used on the Project, as well as how and where it will be stockpiled/processed for re-use either as part of the Project or in identified areas outside of the Project. The material handling sites will be constructed, operated and maintained in a manner that ensures the health and safety of all persons, and prevents adverse effects to the natural environment and impairment of water quality.

For the MSF, a minimum of 75 per cent of demolition, excavation and construction debris will be diverted from landfills by separating materials on-site, upstream of receiving facilities, or by using a receiving facility offering off-site sorting services.

In addition, the following opportunities for material re-use and recycling and environmental management will be undertaken:

- Grinding up existing concrete bus station platforms for sub-base and re-using major station infrastructure elements in the new station design;
- Use in excess of 250,000 board feet of reclaimed ash wood in the stations as roof soffits, benches, possible screens and other station features;
- The MSF Building will be designed to fully satisfy LEED Canada-NC Certified requirements;
- Modularization through elements of the design is targeted toward efficient component construction with minimal waste and simple efficient assembly; and,
- Recycling all oils used in vehicles, and recycling and processing of water used in the vehicle wash plant, are all designed to reduce consumption.

RTG will reduce the total waste generated by using strategies that minimize waste such as shop fabrication of components and ordering of materials cut to size. The transfer of dust and soil off-site will be minimized by implementing and maintaining an Erosion and Sedimentation Plan.

## **5. Disposal of Excavated Material**

The construction of the underground segment of the Confederation Line will be undertaken with the most up-to-date techniques and with the use of modern construction equipment. The production process has been planned to respect sustainability principles, including compliance with quality standards, safety of workers and environmental safety requirements top of mind. The management of the volume of excavated rock has been assessed based on the rock characterizations outlined in the available geotechnical information.

The underground segment is characterized mainly by excavation through bedrock and hard limestone with mechanical and chemical conditions that provide an excellent opportunity to recycle excavated material. Approximately 95 per cent of the tunnel length is in this type of rock, and the remaining 5 per cent is in soft soil that ranges from good to excellent characteristics. The use of the tunnelling technique known as the Sequential Excavation Method to excavate the running tunnel and all three underground stations will generate clean and non-saturated excavated materials suitable for re-use.

RTG has developed a sustainable plan for the disposal and placement of excavated materials. This plan takes into consideration all necessary measures to minimize environmental impact. RTG will sequence and stage construction to minimize the impact of material extraction to local traffic and surrounding establishments while maintaining the current level of transit services as much as possible. Also, RTG will complete restoration of the downtown before summer 2017.

RTG's sustainability plan includes the opportunity to recycle 75 per cent of the excavated rock, equivalent to 285,000 m<sup>3</sup>, to be used in guideway sub-base and base requirements, concrete for tunnel lining and general concrete usage. The remaining 95,000 m<sup>3</sup> of rock originated material is expected to be non-suitable for construction

uses because of deficient mechanical characteristics and will be disposed of as non-contaminated materials in the quarries operating in the vicinities of the city, such as: Moodie Quarry, Stittsville Quarry, Rideau Quarry, and Canaan Quarry. Any non-hazardous contaminated material will be disposed of at approved sites where it will be treated.

The segment of the tunnel close to the Rideau Canal runs through soft soil for a length of 120m, equivalent to 5 per cent of the total tunnel length. This excavation has been designed using leading edge hydraulic excavators with three dimensional articulated booms. The volume of excavated material generated in this segment is 65,000 m<sup>3</sup>. Of that volume, RTG has assumed that 50,000 m<sup>3</sup> will be used as backfill material in the area close to Hurdman Station where embankments are required to construct the guideway approach to the elevated station platform. The remaining 15,000 m<sup>3</sup> will be handled and disposed of as non-contaminated material in suitable landfill locations.

Material disposal strategies have been assessed based on the available geotechnical information and the guidelines developed by the Ontario Ministry of Environment and disposal of excavated material/groundwater will be in full compliance with all legislative and environmental requirements.

## **6. Noise and Vibration During Construction & Operation**

RTG's design incorporates best-in-class noise attenuation methods including floating slab tunnel infrastructure. In addition, the procurement documents set out exacting performance requirements to which the proponent must adhere. As part of the City's preliminary engineering program, acoustics specialists from Capital Transit Partners, the City's preliminary engineering team, conducted a review of industry best practices for noise and vibration mitigation criteria for various users along the Confederation Line alignment, including residential and commercial buildings. That assessment has established a noise and vibration standard that will protect all buildings including highly sensitive receptors like the CBC building on Queen Street and the National Arts Centre on Elgin Street. Noise levels in these sensitive receptors will be baselined and RTG will work with the institutions to meet performance specifications and coordinate construction activities to minimize impacts on their institution's operations. There are no unique noise and vibration conditions present in Ottawa that cannot be addressed through consultation with property owners and the application of modern construction techniques and proper maintenance practices.

Furthermore, to ensure that the concerns of all stakeholders located near the alignment are taken into consideration, the City specified that RTG engage an acoustical engineer to undertake a detailed noise and vibration assessment along the project alignment. That assessment will require consultation with property owners and other affected stakeholders nearby to understand their day-to-day operations as they relate to noise and vibration impacts. Following the assessment, RTG will develop specific noise and vibration mitigation measures as part of the project's final design and will maintain the light rail system to ensure that the mitigation measures remain effective in the future during normal operations.

While some construction-related noise will be unavoidable as the Confederation Line is being built, RTG’s construction methods and mitigation strategies will minimize disruption to the best extent possible.

## 7. Cash Allowance Work

Cash Allowance Works are a series of approved/budgeted municipal infrastructure projects that, due to their location or planned construction schedule, are more effectively implemented as part of the Confederation Line construction. These works are not included in the project budget as they were outside of the project scope. These projects are integrated to achieve improved fiscal management and to benefit from economies of scale resulting from existing Confederation Line construction work.

Cash Allowance Work	Budget Reference
Rock Stabilization	#906913 Slope Stabilization-Transit
Combined Sewage Storage Tunnel	#905705 ORAP - Combined Sewer Overflow Storage (2013 Capital Budget Request – Rate Funded Programs)
Albert Street Reconstruction and Sewer Separation	#906056 O-OTM ORAP-Albert St / Scott Street #906052 O-OTM ORAP Booth (Primrose-Albert) #905567 O-OTM ORAP Empress/Perkins/Lorne
Queen Street Road Reconstruction and Watermain replacement	#906737 Queen St (Bronson-Elgin)
Coventry Pedestrian Bridge	#903271 Coventry Overpass to Train Station #906567 TMP Transit Supplementary Network

**Table 4: OLRT Cash Allowances**

## 8. Construction/ Operation System Safety

The health and safety of the public, as well as the protection of property and the environment are key priorities during construction, operations, maintenance and service of the Confederation Line.

The safety of employees, contractors and other authorized personnel on-site during construction will be covered by the Construction Safety Plan, which will include safe working practices, proper traffic management and control and, special conditions such as working at heights, in the constrained space of the tunnel and the powering of electrical equipment. All construction areas will be securely fenced and patrolled to prevent unauthorized entry.

The security of employees, contractors and other authorized personnel and property on the site during construction will include threat identification and assessment, a risk register, risk mitigation, access control, locks and keys, ID badges, definition of responsibilities of security staff, other employees and contractors, disciplinary measures, inspections, incident reporting, alarms, liaison with local emergency response agencies and, development of emergency response protocols.

RTG's construction team members have positive safety records reflected by their lower-than-industry-average workplace insurance rates. All members track their health and safety statistics and have records that demonstrate they are consistently below industry averages for workplace injury and severity rates. Continuous inspection and monitoring will validate compliance with the Construction Safety Plan and OSHA legislation. In addition to monthly Joint Occupational Health and Safety Committee inspections, supervisory and safety personnel will conduct daily inspections concerning: general site conditions; tools; materials and processes; equipment; area-specific inspections (e.g. site containment, public and motorist safety, project security, fire safety); work-area specific issues (e.g. excavations, tunnel works, elevated works); and, personal protective equipment inspections of on-site workers.

A security and public safety program will be developed to protect work areas from inadvertent or unauthorized entry and to ensure that the public, motorists, businesses and the surrounding community are properly protected from the construction. Fences, gates and barriers will deter inadvertent or unauthorized entry. The Public Safety and Security Plan will describe the protection to be used at various Confederation Line locations as well as security monitoring requirements that will be integrated with the Construction Safety Plan and Traffic and Transit Management Plan to ensure public safety and security during both construction and operation of the system.

RIO staff has been meeting regularly with the City's Emergency Preparedness Group to ensure first responders and emergency services access and route needs are met both during construction and operation of the system.

## **9. Early Planning for OLRT Implementation**

Council has made several decisions over the last two years that will ensure that, during the construction of the Confederation Line, the impacts on how residents in the City move to and from work and recreation are minimized. These decisions include the following initiatives:

- Advance planning of major arterial road works through Ottawa on the Move and the Capital Works program to minimize impacts and conflicts when Confederation Line construction work is underway;
- Provision of infrastructure for parallel BRT through bundling of Highway 417 and including Scott/Albert widening (on a temporary basis);
- Investments to provide realistic alternative transit services, including increasing service frequency on the O-Train, routing bus service from communities to the south to utilize the Southwest Transitway once the Strandherd Armstrong Bridge is open;
- Investments in cycling infrastructure; and,
- Approval and investment in a comprehensive City-wide Transportation System Management Program.

These decisions are complemented by the incentives and disincentives in the project contract to ensure that the construction schedule and planning have mobility as a critical

factor. The following section outlines some of the key mobility features contained in RTG's submission.

## **10. Proponent's Overall Approach to Transit/Traffic Management**

RTG's proposal outlines a number of detailed approaches to manage traffic flow and minimize the extent and duration of Transitway closures/diversions, including commitments to:

- Undertake an in-depth traffic analysis and assessment to enable efficient Transitway and roadway detours;
- Use a Sequential Excavation Method for the underground section of the alignment in the downtown core to minimize surface impacts;
- Route construction traffic to minimize disruption to all road users; and,
- Develop a works schedule and construction approach to minimize traffic impacts.

Road operations for all road users will be assured through the appropriate design of detours. This includes the provision of adequate merging distances where there is a transition between reserved and mixed-use transit lanes as well as careful consideration of turning movements to minimize impacts on pedestrians and cyclists. Specific measures to improve road operations, such as the adjustment of the Vanier Parkway intersection with the Highway 417 westbound off-ramp (and related bus lay-by facilities) will be examined as part of fully integrated Traffic and Transit Management Plans.

## **11. Minimizing Delays to OC Transpo Bus Operations**

The goal of the Traffic and Transit Management Plan is to minimize the impact on OC Transpo services during construction. Where transit detours are required, transit routes will be kept as close as possible to current routes, minimizing additional travel time for transit users and buses.

Delays to OC Transpo bus operations will be minimized by maintaining operations on the Transitway for as long as possible. When Transitway closures can no longer be avoided, the City will make use of transit priority measures implemented in advance of Transitway closures in both the west and east ends. The project procurement specifically constrained the closure of the Transitway until such time as alternative BRT routes are in place, including linking the completion of the Highway 417 widening project with the closure of the Transitway east of the downtown core. There will be regular, scheduled coordination with OC Transpo planning and operations staff throughout the construction period to plan the implementation of alternative BRT services. Enforcement of transit priority measures will be important as the OLRT project proceeds. Examples of the approach to preserving the frequency and quality of transit services in the west, central and east segments of the project are outlined below.

### ***West Section***

Impacts on OC Transpo buses will be minimized by creating an alternate west BRT with dedicated bus lanes on widened Scott /Albert Streets and temporary stop facilities on



Scott/Albert Streets at Bayview Station and Booth Street. This will minimize delays, and reduce the need for additional routes as the service on Scott/Albert Streets will provide for all existing connections. Part of the Transitway between Tunney's Pasture and Bayview Stations will remain open while the Bayview Bridge works are underway. This will allow normal Transitway operations to continue between Tunney's Pasture Station and Merton Street as buses will only use the temporary reserved transit lanes on Scott Street east of Merton Street during this period.

### ***Central Section***

The sequential excavation mining method proposed for the tunnel portion of the central section will significantly benefit bus operations and general traffic by minimizing lane closure requirements in the downtown core. Lane closures will be minor, relating to the entrances and vent construction required at the downtown stations. Typically, an adjacent lane would be closed while the entrances/vent shafts are being constructed.

During construction of the downtown stations, the existing Transitway facilities on Albert and Slater Streets as well as on the Mackenzie-King Bridge will be retained through to the start of revenue service on the Confederation Line. Construction activities on Queen Street for the station entrances will impact local bus services currently operating on Queen Street.

To accommodate the construction of entrances and vent shafts for the Downtown West, Downtown East and Rideau Stations, some sidewalk closures will be required. Temporary pedestrian and cycling paths will be installed as part of a comprehensive plan to maximize the safety of pedestrians and cyclists. There will be a need to temporarily relocate some bus stops on Rideau Street; however, a pedestrian study will be undertaken to ensure there is sufficient capacity to accommodate pedestrians and transit services during the construction and operation of Rideau Station.

Construction of the east portal of the tunnel will require the closure of the section of Transitway south of Laurier Avenue to where the Transitway parallels Nicholas Street. Detour plans include the construction of a temporary BRT on the east side of this section of Nicholas Street. Buses would then follow Laurier Avenue to access the Transitway at Laurier Station. Detour arrangements proposed in the vicinity of Laurier and Campus Stations will allow the Transitway to operate through both of these stations with minor delays, until spring 2016.

In later stages of construction, it will be necessary to close Campus Station, Lees Station and the Rideau River Transitway Bridge. At this time, BRT services will be provided on Nicholas Street to the Highway 417 exclusive bus lanes. At this time, Campus Station will be closed and Laurier Station will serve the University of Ottawa and Sandy Hill. To facilitate transit operation, a bus lay-by area will be provided on Laurier Avenue near Laurier Station, to assist in the maintenance of transit services in the central and east sections.

### ***East Section***

Leveraging the planned widening of Highway 417, the new Highway 417 lanes will be used to create the alternate east BRT during Confederation Line construction, keeping most bus delays down to a few minutes. Linking the closure of the east Transitway to the completion of the Highway 417 widening for exclusive transit use, is a key part of the project strategy to minimize impacts on OC Transpo's operations and, was one of the driving forces behind "bundling" of the Highway 417 project into the overall umbrella of the Confederation Line project implementation.

Once it is necessary to close Lees Station and the Rideau River Transitway Bridge, BRT services will use the widened Highway 417 lanes between St. Laurent and Nicholas.

During the closure of the east Transitway, it will be possible for westbound service to leave and exit the St. Laurent Station directly from Highway 417 via a new temporary access ramp. However, most of the eastbound buses will not stop at the St. Laurent Station and instead, will remain on the widened Highway 417 and Highway 174 to Blair. Some service from downtown will need to leave Highway 417 at St. Laurent and serve the local platform of the station and continue to Blair Station via Ogilvie Road. In addition, a connecting service between Hurdman, Train and St. Laurent Stations will be required.

Southeast Transitway service will be detoured onto the widened Highway 417 lanes when the Rideau River Transitway Bridge is closed. This will be done via Industrial Avenue/Vanier Parkway/Riverside Drive and is anticipated to introduce unavoidable delays of several minutes. To minimize delays to afternoon westbound express services which are currently staged from the lay-up area at Hurdman Station, a lay-up area in the northwest quadrant of the Highway 417/Vanier Parkway interchange will be provided.

## **12. Minimizing the Need for Additional OC Transpo Service During Construction**

OC Transpo's operating costs are closely related to the number of buses required to provide peak period capacity and the number of bus hours and kilometres needed for service throughout the day. Given the need to minimize the above costs, RTG will undertake the following:

- Accelerate completion of the Highway 417 widening required for the alternate BRT;
- An efficient construction staging plan in order to reduce the number of extra buses and hours of service required;
- Use transit priority measures that minimize transit trip times and the additional fleet required to maintain high quality transit service;
- Make traffic camera information from additional cameras on the detour route available to the City's Traffic Control Centre, supplementing the City's camera network to assist in service monitoring and control;

- Provide a staging area for westbound express buses during peak times in the northwest quadrant of the Highway 417/Vanier Parkway interchange (reducing in-service time in the afternoon peak); and,
- Implement transit priority lanes at Nicholas, Vanier and St. Laurent interchanges and through the Highway 417/174 split.

### **13. Ottawa on the Move**

While the Confederation Line is the most substantial construction project in the City's history, it is not the only construction project in Ottawa over the next five years. Ottawa on the Move advanced \$340 million in infrastructure funding to result in a \$500 million infrastructure renewal program focused on keeping our community and economy moving forward through strategic investments in a number of other road, water, and sewer projects.

Ottawa on the Move will also keep residents informed about construction impacts of the Confederation Line and other projects and will provide up-to-date information and travel choices to maximize transportation choices while maintaining the mobility of people and goods in the period leading up to Canada's 150th anniversary of Confederation.

This initiative will include promoting alternative working hours/shifts to avoid congestion peaks, real time construction info and trip planning tools, state of the art real time construction signage and notices, as well as an overall strategy to promote alternative transportation modes that will lessen the impact of these construction projects, especially during peak periods.

Further details of this program will be developed and outlined to the Transit Commission and Transportation Committee early next year.

## **F. PROPERTY ACQUISITION AND BUSINESS DEVELOPMENT STRATEGY**

### **Property Acquisition Update**

City Staff continue to advance the property acquisitions strategy as directed by Council through the May 2011 [OLRT Schedule Acceleration and Procurement Option Selection](#) and the March 2012 [OLRT Design Improvements Update](#) Reports. To date, approximately 85 per cent of the required lands for the OLRT project are under City control.

The acquisitions to date have been advancing through three distinct phases:

- Phase 1 consisted of the Maintenance and Storage Facility (MSF) properties and a downtown vacant site (156 – 160 Lyon Street). This phase is now complete and these properties are now under City ownership;
- Phase 2 consists of University of Ottawa as well as subterranean rights below, Christ Church Cathedral and the Russian Orthodox Church. Council granted staff the authority to issue the notification of intent to expropriate on March 6, 2012. Staff is now seeking authority to register the Expropriation Plan, serve the

Notices of Expropriation, Election and Possession pursuant to Sections 9, 10 and 39 of the Expropriations Act, as well as serve a Section 25 offer for those properties that have not yet been acquired.

- Phase 3 consists of other outstanding private interests, both surface and subterranean rights. Staff are seeking the authority to issue the Notification of Intent to Expropriate for these properties. Prior to serving Notices of Intent to expropriate such interests, detailed sketches will be provided to the affected property owners illustrating the boundaries of the affected property.

While property acquisition is preceding on-time according to the accelerated schedule approved by Council in May 2011, the City continues to manage risks related to these acquisitions and to be responsible for the acquisition of property as outlined in the Project Agreement.

To continue to advance the property acquisition strategy in keeping with Council's accelerated schedule, City staff are requesting that Council approve the necessary expropriation authority for Phases 2 and 3;

Phase 2 of the expropriation process is the completion of the process initiated by the issuance of notices of intent to expropriate earlier in the year. In the intervening period the City has reached negotiated agreements with many of the owners and as a result, will only be proceeding with expropriation of a limited number of interests. A by-law is required to approve the expropriation of these lands. The proposed by-law includes lands owned by the University of Ottawa, but a negotiated agreement with the University is in final form, subject only to Board approval which is expected to be received on December 10, 2012. If Board approval is forthcoming, the proposed by-law will be amended to delete the University of Ottawa lands, prior to Council's consideration. The Russian Orthodox Church and the City have also completed a negotiated agreement but the transfer of ownership has not yet occurred. If the transaction is finalized, the proposed by-law will be amended to delete the Russian Orthodox Lands, prior to Council's consideration. The City and the Christ Church Cathedral have concluded an amicable agreement and the property interest required from them was transferred to the City in November 2012.

Phase 3 of the expropriation process for the OLRT project and the expropriation by-law attached as a Schedule to this report, provides for the making of an application for approval to expropriate certain properties required for the OLRT Project; including property required for portions of the tunnel and the integrated stations. These property requirements are within the areas described as the Innovation Zone in the report to Council dated March 6, 2012. The specific property to be expropriated is identified in Schedules A and B (December 12) of the attached expropriation by-law. All of the property owners of the lands identified in Schedules A and B of the by-law have been notified.

Throughout the design process for the OLRT, Hydro Ottawa identified easements and land requirements for its installations. It is proposed that the City act as agent for Hydro Ottawa with respect to the negotiated acquisition or, if necessary, the expropriation of the required property interests that Ottawa Hydro requires for the OLRT. A Hydro

Agency Agreement has been prepared to outline the terms of this agency arrangement and approval is required by Council as outlined in the Recommendation 4. The Summary of Key Terms of the Hydro Agency Agreement are as set out in Appendix 2.

The terms and conditions of the MOU with the NCC address which interests in NCC property required in connection with the OLRT Project are to be licensed and ultimately granted and conveyed to the City. The MOU will ensure that NCC property is available in time for commencement of construction of the OLRT Project, while providing the City and the NCC with an opportunity to continue to work towards resolution of various matters, including outstanding issues under existing agreements and valuation of the NCC property.

In exchange for timely access to NCC property, the City is to deliver to the NCC, to hold in escrow, an amount equivalent to the market value of all of the NCC property (being \$49,000,000) together with a performance deposit equal to 50 per cent of the escrow amount (being \$24,500,000) which is intended to guarantee performance of City obligations on or prior to deadlines established in the MOU. The escrow amount, in consideration for the transfer of the NCC Property to the City subject to adjustments in accordance with the MOU, will ultimately be released to the NCC. The Summary of Key Terms of the NCC MOU are as set out in Appendix 2.

The terms and conditions of the University of Ottawa MOU address which interests in University of Ottawa property required in connection with the OLRT Project are to be licensed and ultimately granted and conveyed to the City. In exchange for these rights, the City will be providing the University with temporary replacement parking during the construction of the OLRT and will grant and/or convey to the University certain interests in City lands. The Planning and Growth Management department will be proceeding with a report to Planning Committee in January 2013 in support of the temporary zoning required for the relocation of parking. Real Estate Partnerships and Development Office staff will be proceeding with a report to Finance and Economic Development Committee in January 2013 to declare the City lands surplus in order to complete the necessary land exchange. The MOU is conditional on approval of the University of Ottawa's Board of Directors. The Summary of Key Terms of the University of Ottawa MOU are as set out in Appendix 2.

The MOU with VIA Rail has not been finalized. It will address the terms and conditions upon which VIA will transfer and convey to the City certain property interests required for the OLRT Project, including the construction of the LRT station, grade separated corridors, and other ancillary works and improvements. Staff are requesting that the Deputy City Manager, Planning and Infrastructure be delegated the authority to finalize the MOU.

Other Memorandum of Agreements (MOA's) are being completed under Delegated of Authority as outlined in BY-LAW NO. 2012 – 109 and will be finalized by mid-December. The two agreements are with Parks Canada and Public Works and Government Services (PWGSC). Information on each agreement is summarized below.

The Parks Canada MOA sets out the rights and obligations of each party and the terms and conditions upon which the conveyancing of certain lands required for the OLRT Project is to take place. The City will acquire a property interest in the subsurface of Parks Canada lands in the form of a long-term easement. Until such easement is conveyed to the City, Parks Canada will grant the City a license of occupation to provide for access to the lands.

The PWGSC MOA sets out the rights and obligations of each party and the terms and conditions upon which the conveyancing of certain lands required for the OLRT Project is to take place. The City will acquire various property interests in PWGSC lands in the form of a lease, a fee simple interest, and a long-term easement in respect of certain lands at Tunney's Pasture and certain subsurface lands. Until these property interests are conveyed to the City, PWGSC will grant the City the following three licenses of occupation: (1) for construction purposes; (2) for the lands to be leased and lands to be conveyed in fee simple; and (3) for the subsurface lands, if required, to be conveyed as a long-term easement.

In addition, the Legal Appendix provides a description of the following legal agreements:

1. Contribution Agreement with the Province of Ontario;
2. Contribution Agreement with the Government of Canada;
3. Legal Agreement between the City and the Province regarding the bundling of the Highway 417 Widening; and
4. Railway Delegation Agreement

### **Business Development Strategy**

As part of the Downtown Ottawa Transit Tunnel (DOTT) Planning and Interim Environmental Assessment Study (Ref N°: ACS2009-ICS-PLA-0069), Council directed staff to release a Request for Information (RFI) to property owners within, and adjacent to, the recommended corridor alignment to solicit ideas on station access, development and design.

Further, it was determined that the City should create a Business Development Strategy (BDS) to engage potential stakeholders, and that this initiative be deployed only once the EA process was approved and funding commitments received from both the provincial and federal governments.

The design and architecture approach and the detailed station entrances outlined in this section are included in the fixed price contract negotiated with the preferred proponent and are in line with the functional design approved by Council.

As outlined in Recommendation 4 (d) the Deputy City Manager, Planning and Infrastructure will complete and execute any agreements required for station integrations within the project's budget authority and subject to the terms and conditions described in the Business Development Strategy as outlined in this section.

Staff is pleased to report that as a result of this engagement, several integration opportunities have been identified.

*Brookfield – Downtown West:*

RIO has undertaken detailed discussions with Brookfield, which have led to the establishment of a framework agreement outlining principles for further negotiations toward a final agreement in connection with the project's requirements for an integrated Downtown West station entrance in the Podium Building. This framework also includes details related to securing the required construction staging area at the south east corner of Queen and Kent Streets.

*Sun Life Financial – Downtown East:*

RIO has undertaken detailed discussions with Sun Life Financial which have led to the establishment of a framework for continued negotiations in connection with the project's requirements for a Downtown East western station entrance in the Atrium between the east and west towers. Sun Life's contribution will include incremental costs for integrating the station's entrance and the required lands associated with the entrance connection.

*Cadillac Fairview – Rideau Station:*

RIO is continuing discussions with Cadillac Fairview to establish a framework regarding an integrated entrance to Rideau Station that includes: an entrance at the corner of Rideau Street and Colonel By Drive, an access from the food court location, and elevator access from the adjacent level of the main Freiman Mall thoroughfare. The Rideau Centre's contribution will include incremental costs for integrating the station entrances and the required lands associated with entrance connections.

Detailed descriptions of the MOU's are attached in the Appendix 2.

## **G. OLRT PROJECT AGREEMENT TERMS AND RISK TRANSFER**

### **1. Project Agreement**

The Project Agreement is the primary legal mechanism that will govern the construction and 30-year maintenance and service period of the Confederation Line. The agreement sets out the fundamental elements of the contractual relationship between the City and RTG. It covers all works to be undertaken, including the various roles, rights and responsibilities of each party. The Project Agreement includes detailed specifications that the Confederation Line and Highway 417 must meet upon substantial completion. In the case of the Confederation Line, the maintenance specifications apply throughout the 30-year maintenance and service term.

During the construction period, the City will make lump sum payments upon substantial completion of Highway 417 and payments for completion of specified construction milestones on the Confederation Line, including a large final payment when the system

is complete, fully commissioned/tested and certified as ready for full revenue service. During the maintenance and service term the City will make monthly service payments, subject to adjustment for any underperformance by the maintenance and service provider.

The Project Agreement also details the respective obligations of the parties and the consequences of any failure to fulfill those obligations. In addition, the Project Agreement contains indemnities, liability limitations, and default/termination provisions, including the consequences of termination of the Project Agreement. Finally, the Project Agreement contains express dispute resolution provisions.

For a more detailed description of the Project Agreement, the Provincial Contribution Agreement, the NCC Memorandum of Understanding and the agreement between the City and the Province on the Highway 417 Bundling, please refer to Appendix 2.

## **2. RFP Incentives/Disincentives**

### ***“Operations Matters”***

“Operations Matters” was built into the competitive procurement process to ensure that the impact of the different bid solutions on the City’s operating costs, through the number of onboard staff needed to operate the vehicles, was reflected, considered and factored into the evaluation. Annual onboard staff hour targets were established for each of the 30 years and were included in the bid evaluations as an add-on to the Net Present Value (NPV) of the bids for evaluation purposes. In order to avoid the bidders underestimating these targets, a penalty (or “painshare”) was established in the Project Agreement relative to the annual onboard staff hour target for each year.

For the annual driver hour target, a +5 per cent buffer is applied to the target values before painshare is applied. During the 30-year maintenance and service period, if annual onboard staff hours are greater than 105 per cent of the target value, the Maintenance Provider is charged painshare for all of the additional hours in excess of 105 per cent.

### ***“Mobility Matters”***

Mobility Matters was built into the Project Agreement to influence the bidder’s approach to maintaining a high level of service during construction and to encourage an approach to construction that minimizes the number and duration of lane closures on the Transitway and public roads.

Each bidder was required to commit to a specific estimate for Transitway and roadway lane closures based on their submitted construction plan. Each bidder’s lane closures requirement was subject to a lane rental charge for each hour of affected block of roadway or Transitway segment and this cost was added to bids for evaluation purposes. Lane closure costs were established that vary with the time of day and day of the week to reflect the magnitude of the impact on OC Transpo and the commuting public. In order to avoid having the bidders underestimate these targets and to



encourage efficient execution during construction, a system of penalties (“painshare”) and rewards (“gainshare”) enforced the commitments made in each bid.

A baseline of \$65 million was established to measure each bidder’s Transitway closure plan. Better performance, measured against the expected baseline, allowed bidders to receive a gainshare allowance equal to 50 per cent of the difference between the threshold value of \$65 million and the bidders planned impact cost. The gainshare allowance will not be paid in cash when achieved, but will be used to offset any painshare that may be applied under other painshare provisions during construction.

For the Transitway, a +10 per cent buffer is applied to the target values before painshare is applied. If the Transitway lane closures are greater than 110 per cent of the target, RTG is charged for the cost of the Transitway lane closures exceeding the buffer. Any established or remaining gainshare allowance can be applied against this painshare amount.

Lane closure targets for public roads are administered in a similar manner to the Transitway lane closures except that no gainshare allowance exists for these closures and no offsets to painshare are possible.

### ***“Energy Matters”***

Energy Matters was developed to ensure long-term affordability and efficiency of the system as the City is responsible for energy costs. These provisions also reinforce the City’s commitment to environmental sustainability in compliance with Council’s priorities on Environmental Stewardship and Financial Responsibility. Energy Matters influences the project design towards creating an energy efficient solution for the traction power system that provides the energy for the vehicles and the operation of the MSF.

Expected energy use commitments for traction power requirements and MSF operations were undertaken by each bidder, based on the baseline service hours and ridership projections provided by the City for the 30-year period for maintenance and service and, included in the bid evaluation as an add-on to Net Present Value. Again, in order to hold bidders to these commitments and discourage the underestimation of energy use, a system of penalties (painshare) and rewards (gainshare) was established for each year of the 30-year maintenance and service term.

For the MSF, a  $\pm 5$  per cent buffer is applied to the target values before gainshare or painshare is applied. For traction power, a slightly larger buffer of -5 per cent, +10 per cent were applied to the target values before gainshare or painshare is applied. The buffer for the traction power reflects the higher degree of uncertainty in modeling traction power energy usage. If the energy usage is 80 per cent to 95 per cent of the target value for any given year, the energy savings (or gainshare) is split between the City and Maintenance Provider. For any energy usage that is below 80 per cent of the target value for any given year, the additional energy savings is awarded 100 per cent to the Maintenance Provider. If energy usage is greater than 105 per cent of the target value (110 per cent for traction power), the painshare provisions require the Maintenance Provider to pay for all of the energy exceeding the buffer.

### **3. Risk Transfer**

#### ***Construction Period***

As a general overview, during the construction period RTG bears the construction risk, including risks associated with cost overruns, methodology, quality, scheduling as well as integration with the current transit system. In addition, RTG bears the ultimate risk with respect to geotechnical conditions for the tunnelling work.

Subject to certain exceptions, use of the land and other existing infrastructure is on an “as-is, where-is” basis. RTG bears all risks related thereto, subject to a few exceptions.

Subject to certain exceptions, RTG will pay the City liquidated damages if the Revenue Service Availability is not achieved by the agreed upon date.

The City is responsible for acquiring the real property interests required for the Project by the agreed upon acquisition dates.

RTG bears all geotechnical risks related to the tunnel and underground station construction.

RTG bears the risk with respect to any (i) latent defects of existing works and infrastructure on the OLRT Lands, (ii) Highway 417 site conditions, (iii) fossils, artefacts and other objects with artistic, historic, archaeological or monetary value, (iv) species at risk, (v) contamination, or (vi) encumbrances where such risks are described in or are properly inferable, apparent or discoverable from the background information or reasonable due diligence. The City bears all other risks with respect to those items.

Each party is responsible for obtaining the permits and approvals it requires to perform its obligations. The City shall obtain the NCC Federal Land Use Agreement (FLUA) and RTG will comply with the NCC FLUA requirements.

#### ***Maintenance Term***

During the maintenance and service term, RTG bears the risk that the service quality standards are maintained, including on-time performance and general maintenance. RTG is also responsible for ensuring that, at the end of the maintenance and service term, the vehicles and fixed infrastructure assets are handed back to the City in good condition.

The City is responsible for the operation of the Confederation Line as well as oversight of the 30-year maintenance and service term through OC Transpo.

### **H. OPERATIONS AND MAINTENANCE APPROACH**

RTG will have full responsibility for all aspects of the maintenance and service of the system and ensuring its full availability at all times. RTG is at risk not only for the

maintenance payments but also for payments related to the \$300 million in private financing they will maintain until the end of the maintenance and service term. The City's exacting standards will be enforced to maintain every element of the Confederation Line to specific standards of quality and serviceability.

RTG must also maintain the guideway and stations in good condition, including cleanliness and snow removal. This will relieve OC Transpo of more than \$1.5 million in annual operating expense related to existing station maintenance and Transitway maintenance costs. It is the responsibility of RTG to immediately address any vandalism, although the City will bear the costs of vandalism repairs on a pass through basis at stations or with respect to in-service trains, where the City maintains responsibility for security. RTG is responsible for any vandalism at the MSF where they are responsible for access control and security.

Built into the Project Agreement is a series of penalty provisions to ensure that all elements of the system are in service during operation. These provisions cover the operation of the vehicles, elevators/escalators, heating and lighting, wayfinding, etc. The penalties have been apportioned in relation to the type and severity of availability failure and are calibrated to be strong incentives for immediate resolution.

This penalty system is one of the advantages of the AFP procurement approach, as the strength of the penalties for non-compliance results in better service reliability than when publicly managed.

As well, the Project Agreement outlines specific handover requirements at the end of the 30-year term, including an inspection regime in the final years of the term and specific asset handover condition requirements, which must be satisfied prior to handover.

## **I. CITY SUPPORTING ACTIVITIES**

### ***Permits and Approvals***

The Confederation Line requires permits and approvals from both internal and external agencies in order to proceed. Key approvals, such as the federal and provincial Environmental Assessments, have already been completed or will be complete before financial close is reached. The Highway 417 component of the project has acquired all federal and provincial EA approvals. Other key approvals, such as the NCC's Federal Land Use, Design and Transaction approval, are expected to occur in timelines that meet project requirements.

The overall responsibility for obtaining permits and approvals is designated in the relevant sections of the Project Agreement. In general, the City is responsible for obtaining approvals before contract award, while the RTG is responsible for obtaining the majority of the permits and approvals after contract award including demolition permits, construction permits and Environmental Compliance Approvals.

Notwithstanding the responsibilities outlined in the Project Agreement, it is the intention of RIO staff to assist RTG and facilitate in the acquisition of the required permits and approvals to the greatest degree possible.

### ***Legislative Requirements***

The following legislative amendments and approvals are being sought under separate reports or by-laws to Council in order to implement the OLRT project:

- An Official Plan Amendment to introduce the Development Zone of Influence for the Confederation Line alignment, and associated guidelines, will be before Council in early 2013. The effect of this amendment will be to add a perimeter around the alignment, within which development applications can be held to a greater level of scrutiny to ensure that there are no negative impacts on OLRT infrastructure or facilities;
- A Zoning By-law Amendment to clarify that Confederation Line-related construction staging areas are permitted across all zones in By-law 2008-250. The Zoning By-law already permits a “rapid-transit system” across all zones and this amendment is required for clarification purposes;
- A further Zoning By-law Amendment is being sought to accommodate parking displaced by Confederation Line construction at the University of Ottawa’s campus within the parking lot at Sandy Hill Arena and,
- A Road Closing application to close part of old Wellington Street, between Brickhill and Commissioner Streets. This section of Wellington Street is a future location of the Confederation Line alignment and therefore, requires closing prior to commencement of construction;
- A Road Dedication By-law to allow the City to assume various City-owned pieces of land abutting existing rights-of-way in the LeBreton Flats area as part of the public right-of-way. This will have the effect of widening those relevant rights-of-way to a width closer to that articulated in the Official Plan. It will further assist Ottawa Hydro in installing temporary sub-surface utilities in this area, required to power the Confederation Line’s construction, without requiring easement agreements with the City; and
- Declare the lands surplus required to fulfill the terms of the Ottawa University agreement.

### ***Noise By-law***

In order to construct the Confederation Line, particularly the tunnel component through the downtown core, it will be necessary to augment the City’s Noise By-law as it does not provide for rules regarding subterranean tunnel construction. This by-law will allow for certain construction activities in the tunnel as long as it meets defined decibel limits at the surface (point of reception).

### **RURAL IMPLICATIONS**

There are no specific rural implications associated with this report.

## CONSULTATION

The City has conducted a thorough consultation program throughout the development of the Confederation Line. Five public open houses have been held to date: on February 26, 2009, June 24, 2009, October 26, 2009, February 23, 2010 and March 19, 2012.

The RIO has also conducted consultation and outreach sessions with seven BIAs, 16 Community Associations, the Ottawa Chamber of Commerce, local Aboriginal groups and First Nations, and several consultation sessions with City Council's Advisory Committees. The project team maintains active relationships with more than 40 external agencies with a direct interest in the project. These include funding partners, regulatory bodies, transit clients and the Algonquin of Ontario.

In addition to these activities, the RIO maintains the [ottawalightrail.ca](http://ottawalightrail.ca) website and uses Facebook and Twitter to keep residents informed about the project. To date, more than 132,000 unique visitors have viewed the website. The project team continues to respond to public inquiries submitted through the website, e-mail, telephone and from the offices of Councillors and the Mayor.

As the project moves forward into the construction phase, public consultation will become a shared responsibility of both RTG and the City. City staff, under the direction of Council, will retain the lead communications and public consultation role for the project, while RTG will be responsible for supporting City staff.

### **Ongoing Community and Stakeholder Relations**

While leadership of the consultative approach rests with the City, the Project Agreement outlines a number of specific consultative responsibilities that rest with RTG. These responsibilities include such supporting activities as:

- Provide timely and accurate technical information;
- Provide written and multimedia content for the project website;
- Collaborate with the City to update project stakeholders and participate in community events as required;
- Facilitate reasonable access to project construction sites for the purposes of documentary and archival imagery; and,
- Report to the City on communications matters on an agreed upon basis.

The transition from the design and procurement phase of the project to the construction phase will require a refreshed community outreach approach that can keep pace with a rapidly evolving construction environment as the project advances quickly to achieve the accelerated project schedule directed by Council in May 2011. At the same time, public focus will shift from conceptual design discussions to specific and highly granular project elements that will more directly impact surrounding communities. These include issues such as the specific construction techniques being used and where they are

being used day-by-day, potential noise and vibration impacts, impacts to transit service at affected stations, community impacts related to detouring, parking, and other impacts related to property acquisitions for construction staging.

To address this changing outreach dynamic, the RIO will undertake a community-oriented communications approach similar to what was done for the Bank Street reconstruction and Lansdowne projects, including the following specific initiatives:

- Orient community outreach activities on a geographic basis and directing activities to residents in those areas;
- Revamp the ottawalightrail.ca project website with a focus on construction and mobility using the construction management areas to guide the public's interaction with the project. Website users will be able to select any area of the project, including isolating stations, to receive ongoing updates from the project team;
- Use of social media and the project website to provide daily updates to residents on construction activity, its impacts and required detours;
- Community liaison officers assigned to construction areas to serve as a direct point of contact with project staff for affected residents and Councillor's offices. Liaison officers will take the lead in supporting the City in community relations, deploying tools and communication products that reflect the progress of the project, including:
  - Daily updates to social media accounts, and weekly construction posts to social media and/or project websites;
  - Quarterly Newsletters reflecting key milestones and look-ahead's (higher level than monthly updates) would be mailed and distributed at events; and,
  - Meet regularly with City staff to ensure coordinated communications;
- A "How We Build It" summary will be created, making key technical components of how we build the Confederation Line interesting and easy to understand for the public; and,
- Construction signage and hoarding will be governed by the City's project and schedule requirements. It is anticipated that the public, particularly businesses, will request business advertising/decorative hoarding, which will be discussed with the City during financial close. All traffic management signage will be governed by the respective approvals and protocols.

Milestone Events, hosted by the City and supported by RTG will be an important method of keeping community support active and informed.

## LEGAL IMPLICATIONS

There are no legal impediments to implementing the recommendations of this report. This report includes summaries of the material terms and conditions of certain legal agreements related to the OLRT project and the Highway 417 widening project, but does not describe all the terms and conditions of such legal agreements. Moreover, the legal agreements described in this report, in many cases, include complex concepts that

cannot be completely described in a summary manner. In the event of any inconsistency between the description of the terms and conditions in this report and those in the legal agreements, the terms of the relevant legal agreement are intended to prevail.

In respect of any legal agreement which has not yet been executed and delivered by the parties thereto, it should be noted that:

- This report sets out the anticipated terms and conditions of such legal agreements.
- Where the terms and conditions of a legal agreement are the subject of on-going negotiations, when agreed upon, they will be as set out in the finalized, executed and delivered version of such legal agreement.
- The City's rights and obligations in respect of such legal agreements do not come into effect until they are finalized, executed and delivered.

The description of legal agreements in this report is not exhaustive. It is anticipated that ancillary legal agreements, and other instruments, will be required in order to complete the transactions and matters contemplated in this report.

## RISK MANAGEMENT IMPLICATIONS

There are risk implications. These risks have been identified and explained in the report and are being managed by the appropriate staff.

## FINANCIAL IMPLICATIONS

### **1. Summary**

This report seeks budget authority of \$2.130 billion for the OLRT project. Funding sources for the OLRT include \$1.2 billion in Provincial and Federal grants, as well as provincial and federal gas tax revenues, development charge revenues and capital contributions currently raised on the transit levy. These revenue sources are consistent with those identified in previous reports to Council. In addition this report identifies the on-going operating costs of the OLRT (expected to be \$35 million in the first full year of operation) and compares those to the estimates previously provided to Council.

This report also recommends that the capital budgets for certain associated works be established. Previous reports identified budgets and/or funding sources of \$218 million for the widening of Highway 417 including temporary bus only lanes. In addition a requirement for \$155 million was identified under the initial mobility plan for transition costs that OC Transpo will incur during the construction period to maintain mobility. Under the current mobility plan the funding required to provide alternative bus service during the construction period is much lower than previously estimated. In keeping with good project management principles, the reduced funds are recommended to be redirected to a multi-project contingency budget to be used for any cost changes within the OLRT project and the associated works.

The transit affordability model first presented to Council in July of 2011, has been updated to reflect any changes to the financial requirements associated with the recommendations in this report. In July 2011, the model confirmed that the transit component of Council's existing Transportation Master Plan would be affordable as long as transit fares and transit tax revenues continue to rise with the transit rate of inflation. The update shows that the proponent's delivery model has a positive impact on affordability, primarily as a result of reduced energy and lifecycle costs.

The City Treasurer is able to confirm that all long term debt commitments to be entered into as a result of the recommendations in this report are in accordance with the City of Ottawa Administration of Capital Financing and Debt Policy (April 2010). Further, the City's debt and obligation limit has been updated, in accordance with the Municipal Act requirements, leaving the City well within the limits set by the Province.

## **2. Recommended Project Budgets**

A variety of reports, memos and budget documents have been received by Council that identified the costs of undertaking the OLRT project. These included:

- On October 22, 2009 Councillors received a memo outlining the cost and affordability of the Tunney's Pasture to Blair station project, including the tunnel. That document identified an estimated cost of \$2.1 billion plus an additional \$149 million required by OC Transpo during the construction transition period to deal with the impacts of the construction on the delivery of service as had been identified in the Transit Tactical Plan.
- In July 2011 Council received a report that updated the cost estimates for the OLRT project to \$2.115 billion. At the same time the Transit Affordability Model included a provision for additional bus service hours and OC Transpo costs to maintain mobility during construction adjusted for inflation to \$154.7 million.
- In March of 2012, Council approved the bundling of the Highway 417 project with the OLRT project. The Province had previously announced a funding commitment to this project of \$206 million.
- As part of the 2013 capital budget, Council approved \$11.6 M for Supplemental Transit Networks to fund the construction of bus lanes and ramps to allow the widened Highway 417 to be used as a temporary transit way during OLRT construction.

This report recommends the establishment of the OLRT project budget at \$2.130 billion. This report also recommends the establishment of the following three project budgets for associated works: Highway 417 widening, including bus lanes and ramps; OC Transpo transition to OLRT; Multi-project contingency.

The recommended budgets and funding sources for all capital requirements are described in the following section. Upon adoption of this report any pre-established budgets and funding sources will be realigned to reflect the updated project budgets.

### **OLRT Project Budget – Construction Period**



The recommended project budget is \$2.130 billion. This is a \$15 million, or 0.71 per cent variance from the ORLT costs previously identified.

In July 2011, City Council approved a DBFM procurement model for this project. This procurement model changes the form of how the City funds the project. Long-term project financing of \$300 million is to be provided by the proponent who will design, construct and then maintain the infrastructure. In order to raise the \$300 million the proponent will enter into a long term financing arrangement with long-term lenders and equity providers. The City will then repay this capital investment over the 30-year maintenance and service period. The repayment for this capital component is approximately \$22 million per year including interest.

Traditional city financing of capital works sees the City issue debentures directly in the bond markets. Private sector project financing, will require re-payment by the City which makes this a long term liability for the City. City issued debt is referred to a direct debt whereas this private sector issued debt will be indirect debt. As described earlier in this report, the proponent will be at risk for their maintenance payments and payments to repay this long-term debt. This benefits the City as the proponent's lenders provide additional incentive and oversight to ensure that the project is delivered on time, on budget and built to operate smoothly.

Under the Project Agreement, the City will be required to make a series of 12 milestone payments to the preferred proponent during the construction period starting in 2013 and ending in 2018. The final "revenue service availability payment" will be due in 2018. Also starting in 2018, the City will begin to re-pay the proponent the outstanding \$300 million in capital costs over a 30 year period.

The following table shows the changes in the OLRT capital project cost estimates from previous reports. Included in all of these estimates are the non-refundable HST costs the City incurs on capital projects. Current estimates show reduced property acquisition costs as were discussed previously in this report. The current estimates now include construction period financing and transaction costs associated with this form of procurement. These include interest costs, financing fees, advisory, legal and accounting fees.

#### **OLRT Project Budget – July 2011 vs Current**

<b>Project Budget July vs. Current (Millions)</b>		
	<b>July Estimate \$M</b>	<b>Current \$M</b>
<b>Property, Engineering, Project Management (City works)</b>	<b>397</b>	<b>275</b>
<b>Tunnel &amp; Stations</b>	<b>777</b>	<b>681</b>
<b>Track work/ Systems/ M&amp;S Facility</b>	<b>442</b>	<b>551</b>
<b>Civil Works</b>	<b>174</b>	<b>102</b>
<b>Vehicles</b>	<b>325</b>	<b>344</b>
<b>Financing &amp; Transaction Costs</b>	<b>N/A</b>	<b>177</b>

The sources of funding for the \$2.130 billion project budget will consist of \$1.2 billion from Federal and Provincial grant funding contributions and the remaining \$930 million net cost will be funded from various revenue sources.

These revenue sources include development charge revenues, Provincial and Federal gas tax revenues and City revenues that are raised through the transit tax levy for capital works. This project is growth related and as such was identified in the 2009 Development Charge background study. The City currently receives approximately \$87 million each year in combined gas tax revenues (\$37 M Provincial/ \$50 M Federal) that are dedicated to transit. The City currently contributes approximately \$80 million per year, in funds generated through transit taxes, to the transit capital program. These revenue sources will be used to fund the OLRT project, and will also fund the other capital and operating expenditures included in the Transit Long Range Financial Plan.

The following table summarizes the \$2.130 billion OLRT project budget and its funding sources and identifies the resulting cash flow. Council has approved \$286.6 million in previous capital budgets to fund preliminary engineering and property acquisition costs which are included in the \$2.130 billion project authority. Given the size and the duration of this project the funds reservations will be administered on a yearly basis, instead of being allocated all within the first year, as is typically the case. This will assist in cash flow management and reserve fund forecasting.

### Recommended OLRT Project budget funding sources:

Project Costs	Cash/Debt	Total	2011/2012	2013	2014	2015	2016	2017	2018	2019-2048
		\$M	\$M	\$M	\$M	\$M	\$M	\$M	\$M	\$M
Milestone Payments	cash	(1,295)	-	(262)	(208)	(124)	(506)	(151)	(44)	-
Revenue Service Availability Payment	cash	(228)	-	-	-	-	-	-	(228)	-
Property, Engineering, Project Management	cash	(275)	(145)	(55)	(17)	(10)	(23)	(13)	(13)	-
Capital ASP*	debt	(300)	-	-	-	-	-	-	(8)	(292)
Non-rebateable HST component	cash	(32)	-	(5)	(4)	(2)	(9)	(3)	(5)	(5)
<b>Total</b>		<b>(2,130)</b>	<b>(145)</b>	<b>(321)</b>	<b>(228)</b>	<b>(136)</b>	<b>(538)</b>	<b>(167)</b>	<b>(298)</b>	<b>(297)</b>
Funding Sources	Cash/Debt	Total	2011/2012	2013	2014	2015	2016	2017	2018	2019-2048
Federal and Provincial grants	cash	1,200	89	238	180	107	423	42	120	-
Provincial gas tax	cash	287	-	-	6	14	14	14	14	223
Federal gas tax	cash	129	-	5	22	13	36	16	36	-
Transit taxes	cash	156	-	-	2	-	12	69	73	-
Provincial gas tax	debt	-	-	-	-	-	-	-	-	-
Federal gas tax	debt	33	-	-	-	-	-	-	33	-
Development charges	cash and debt	291	56	44	18	1	52	25	21	74
Transit taxes	debt	34	-	34	-	-	-	-	-	-
<b>Total</b>		<b>2,130</b>	<b>145</b>	<b>321</b>	<b>228</b>	<b>136</b>	<b>538</b>	<b>167</b>	<b>298</b>	<b>297</b>

Millions CAD

\* Includes the long term capital contributed by the P3 provider.

As the project construction will be undertaken over a five-year period and revenues from the sources identified above will flow to the City during that time period, debt authority is being requested in the absence of development charge cash reserves at project initiation. As cash is received from development charges, the debt authority will be reduced. The following table shows the recommended debt authority for the OLRT project. As the equity provided by the proponent is indirect debt that will be repaid with interest over the 30-year maintenance and service period, it is also identified as

required debt authority. Development charge revenue and Provincial gas tax revenues will be used to service the principal and interest on this indirect debt over the 30-year maintenance and service period. The interest component is approximately \$380 million.

### Recommended debenture authority and anticipated debt issue

Debt Servicing Funded From:	Recommended Debt Authority \$M	Anticipated Debt Issuance \$M
Federal Gas Tax	33	33
Development Charges (construction period )	217	36
Transit Taxes	34	34
Private Capital Partnership debt (repaid with development charges and Provincial gas tax)	300	300
<b>Total</b>	<b>584</b>	<b>403</b>

### OLRT Transition - (capital project #906169)

The need for a capital budget to accommodate the costs of disruption for OC Transpo during the construction period and the transition to a combined bus/LRT system was identified as early as 2009 and the first requirement was approved as part of the 2013 budget. A portion of the Transitway will not be accessible during the construction period; there may be a potential need to provide alternative bus service during that period. Previous estimates of \$155 million included the potential need to lease additional buses.

These costs have been revised downward to \$63 million as a result of the decision to require the proponents to provide a staging plan and to incent minimum disruption. Combined with the bundling of the widening of Highway 417 with the OLRT project to allow the additional lane to be used as a replacement for the Transitway, the estimate has been reduced by \$92 million. The transition project budget is funded from capital contributions raised from the transit tax levy. The recommended project contingency budget will be accessed if there are further funding requirements to assist in the transition.

### Highway 417 Widening

The March 2011 Provincial Budget included funding for the widening of Highway 417 between Nicholas Street and the OR 174. This funding was advanced to provide an opportunity to use the additional lanes as exclusive bus lanes to mitigate transit service disruption during construction of the OLRT project. Advancing this work has enabled the project's acceleration and will significantly increase transportation mobility during project construction. In March 2012, Council approved the "bundling" of this project with the OLRT project. At that time, Council was advised that capital costs for widening Highway 417 would be recovered from the Province of Ontario.

The Provincial government has committed \$206 million to fund this work. The 2013 City

budget includes \$11.6 million for the City’s share of bus only lanes and ramps on Highway 417. This final project budget is being recommended to be established at \$226 million and includes both the City and Provincial requirements. This project is funded primarily from Provincial revenues. Development charge revenues have been allocated to a portion of the previously approved City portion included in the Supplemental Transit Networks project budget. The recommended project contingency budget will be accessed if there are cost changes within this project.

**Contingencies**

In keeping with sound project management principles a separate \$100 million multi-project contingency budget is recommended in this report to address future cost changes that may occur within the OLRT project and the two associated works. These three projects do not contain contingencies against potential City cost changes; instead a single contingency budget will provide the flexibility to deal with possible cost changes but also discourage additional spending as the contingency does not form part of the project itself. Possible cost changes are associated with property and utility relocation matters, change orders on the bundled Highway 417 contract and costs required to provide alternative transit service during the construction period. This budget will be funded from the capital funds that are no longer required as a result of the revision in OLRT transition costs.

The following table summarizes the recommended project budgets and funding sources for the associated works and the contingency. Upon adoption of this report, any pre-existing budgets and funding sources will be realigned to reflect the updated project budgets.

**Recommended Additional Project Budgets and Funding Sources**

	Gross Budget \$M	Provincial Revenue \$M	Dev Charges \$M	Dev Charge Debt \$M	Capital Reserve \$M
Hwy 417 Widening	226	206.0	1.6	0.8	17.6
OLRT transition	63				63
Multi-Project contingency	100				100

**3. OLRT Operating and Maintenance Costs**

Annual operating and maintenance costs in the first full year of operation (2019) are expected to be \$35 million, an amount equivalent to the estimate previously provided to Council. The City will pay for driver costs and energy costs directly and will reimburse the proponent through an availability service payment (ASP) for costs associated with maintaining the trains, infrastructure, stations, and the Maintenance and Storage Facility. While maintenance costs are higher than previously anticipated, they are offset by the significantly lower costs for energy.

### Operating and Maintenance Costs – July Estimate vs Current\*

Cost Area	July Estimate (annual) \$M	Current (annual) \$M
Train and Infrastructure Maintenance	23	28
Operations - Driver Labour	5	4
Operations - Energy	7	3
<b>TOTAL</b>	<b>35</b>	<b>35</b>

\*Does not include \$1.6 million of transit maintenance costs already in the transit budget base.

In line with DBFM procurement practices, the City requested that all proponents carry an annual amount of \$3.2 million in their bid price for the cost of insuring all assets (trains, stations, and infrastructure). This insurance will replace a portion of the existing self-insurance obligations currently carried by the City. This includes both bus operations liability insurance and property insurance for the physical infrastructure of the Transitway and stations.

In order to undertake this long-term arrangement, the proponent will establish a special purpose vehicle (SPV), to oversee the project requirements during the construction and operating phases. This is standard practice in delivering public-private partnership agreements of this nature. As such, insurance and administrative costs such as legal and accounting services, that together total an estimated \$4.5 million per year during the maintenance and term, will also form part of the annual future costs.

The following table shows a comparison of the Net Present Value (NPV) in 2018 of the current maintenance, lifecycle and operating costs, to the previous cost estimates included in the July 2011 Transit Long Range Financial Plan. The analysis shows an improvement to the NPV of \$28 million after adding in the \$87 million in insurance and administration costs.

### Net Present Value (NPV) of Maintenance, Lifecycle and Operating Costs - 30 years

	Current	Jul-11	Difference
	\$M	\$M	\$M
Maintenance	804	733	72
Lifecycle	208	243	-35
Insurance and Administration	87		87
<b>Sub-total Paid to Proponent</b>	<b>1100</b>	<b>976</b>	<b>124</b>
Energy	112	228	-115
Labour	138	176	-37
<b>Sub-total Paid by City</b>	<b>251</b>	<b>403</b>	<b>-153</b>
<b>Total</b>	<b>1350</b>	<b>1379</b>	<b>28</b>

## 4. Compliance with Debt and Obligation Policies

The City Treasurer is able to confirm that all long term debt commitments to be entered into as a result of the recommendations in this report, are in accordance with the City of Ottawa Administration of Capital Financing and Debt Policy (April 2010). Further, 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.

Given that the proposed form of financing for this project includes a private sector long term financing component, this report provides additional information to Council that is not required by existing municipal legislation. While this transaction does not constitute a capital financing lease because the asset will be owned by the City, staff is of the opinion that additional disclosure regarding the P3 form of debt financing, along the lines of the disclosure required under capital financing leasing legislation, is of value to Council.

Such a disclosure would require an assessment as to whether the alternative form of financing provides benefits, including the overall economic benefits expected from undertaking the project/capital asset itself, compared with other forms of financing.

This DBFM approach achieves a single line of accountability to deliver and maintain a reliable system with clear performance and availability standards. This integrated private sector approach has been shown to deliver the best results in projects of this type, driving significant savings in overall planning, design, project management, and construction that can sufficiently mitigate any potential cost of consortium held risk or the premium of private financing.

As previously approved by Council, the contract award includes \$300 million in long term capital financing which will be secured by the proponent and repaid by the City over 30 years. The weighted average cost of capital associated with the obligation is 6.32 per cent. The financing cost is estimated at approximately 250 basis points higher than if the City were to issue this debt directly through the bond markets. The rigorous oversight framework that external lenders will bring to this project will help to ensure that the project is delivered on time, as key milestones are achieved, and on budget. Given the benefits of the private sector debt placement, the premium associated with this form of financing is reasonable in light of the benefits associated with this form of procurement.

Under the Project Agreement, the City will be required to enter into long term commitments for a monthly availability service payment (ASP) tied to performance. This payment will include the repayment of the long term private sector financing component, as well as payments to cover maintenance and lifecycle requirements.

The following table summarizes those long term commitments that will be paid through the monthly ASP. Lifecycle costs and a portion of the maintenance cost payments will be adjusted for inflation over the 30-year period. The project agreement will stipulate the inflation rate indices to be used. In addition, a portion of the maintenance costs will vary as transit service levels change. The City's obligations to accommodate inflationary increases in the contract is consistent with the conclusions of the Transit Long Range Financial Plan IV report which reiterated the need for transit fares and

transit tax increases to rise with the rate of transit inflation. In the event that transit service levels are increased, ridership should increase proportionately, thus offsetting the additional costs with concurrent additional revenues in the form of transit fares.

**Availability service payment breakdown**

	<b>Total \$M</b>	<b>NPV* \$M</b>	<b>2019 Payment \$M</b>
<b>Maintenance</b>	1,449	804	29
<b>Lifecycle</b>	407	208	
<b>Insurance and Administration</b>	148	87	4
<b>Capital</b>	679	300	22

\*Amounts are discounted to 2018 at 3.5 percent, with the exception of the long term capital component which is discounted at the effective Weighed Average Cost of Capital to the date at which the revenue service availability payment is made. The rate is subject to adjustment at financial close.

**5. Long Range Financial Plan IV (Affordability) and debt obligations**

In July of 2011 Council received a report from the City Treasurer on the affordability of the transit projects identified in the Transportation Master Plan. This is referred to as the Transit Long Range Financial Plan IV. The plan looked at all capital and operating costs for delivering transit services for the next 37 years to ensure the resources are in place to not only construct but run the system envisioned in the Transportation Master Plan. Stress tests were conducted to ensure the plan was affordable without increasing taxes beyond the inflationary target and without affecting the other critical capital envelopes.

The report concluded that the City can afford to invest and operate the transit system as detailed in the Transportation Master Plan, including the first increment of the Light Rail Transit system. The analysis showed that the plan is affordable with the continued contributions from senior levels of government and with transit taxes and fares increasing at the rate of transit’s inflation.

The affordability of the OLRT project has to be considered within the context of all transit projects and operating costs, as they are all funded from the same revenue sources. These include an annual amount raised from taxation, transit fare revenues, development charge revenues and gas tax revenues.

The Treasurer’s report concluded the following:

- the transit component of the Transportation Master Plan is affordable as long as transit fares and transit tax rates continue to match the actual rate of inflation on transit capital and operating costs required to operate, maintain and expand the system; and
- The City has sufficient debt capacity within the Provincially imposed limits.

The parameters for affordability with respect to debt were and continue to be defined as follows:

- The total City cost of servicing debt will not exceed the annual Provincial Debt Servicing limit of 25 per cent of own source revenue;
- The amount of debt servicing funded from transit taxation will never exceed 7.5 per cent of City own source revenues; and
- The debt issued for any capital work will be fully retired before the end of the asset's useful life.

For purposes of the model the percentage of growth capital works that are to be funded by development charges is set at 43 per cent of the municipal share of the project. The 43 per cent represents the current 53 per cent attributable to growth on transit projects identified in the Development Charge (DC) background study, less the statutory 10 per cent reduction.

Under existing legislation the current DC by-law cannot include the full cost of the change from a bus system to a light rail system, as growth spending is only allowed based on historical costs. As such, the July report noted that the transit component of the current by-law does not generate sufficient funds to cover development charge revenue requirements over the life of the plan. For modelling purposes, collections from the transit development charge have been adjusted upwards by 40 per cent in each of the next four by-law reviews in order to ensure that growth pays for itself. It is important to note that an increase in transit DC collections does not necessarily mean the quantum of the charge has to increase as this can also be accomplished by changes to policies. This could include revisiting policy decisions around the collection of the transit component of the development charge for non-statutory exemptions and the non-residential discounting policy.

The July 2011 Transit Affordability Model has been updated to reflect the financial requirements associated with the award of this contract. All other assumptions regarding revenue sources and post OLRT capital project requirements have not been modified. The model will be updated in the future to reflect Council's completed review of the Transportation Master Plan.

The following chart compares the results of the July 2011 Transit Affordability Model to the update which includes the cost profile for the preferred proponent. The results show that the total debt will decline and the City will be in a better cash position in 2048.

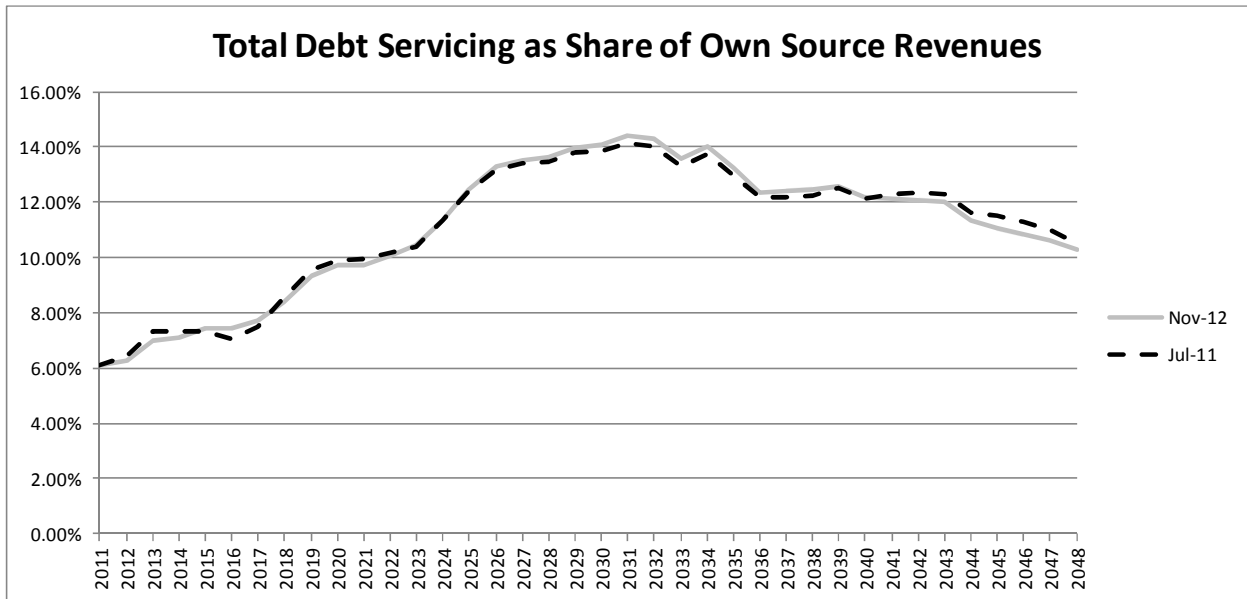


	Jul-11	Nov-12	Difference
	\$M	\$M	\$M
<b>New Debt</b>			
Debt Issued	5,238	5,021	(217)
Principal Paid	(3,876)	(3,782)	94
Interest Paid	(3,240)	(3,288)	(48)
<b>Existing Debt</b>			
Principal Paid	(408)	(408)	-
Interest Paid	(149)	(149)	-
<b>Outstanding Total Debt in 2048</b>	<b>(1,362)</b>	<b>(1,238)</b>	<b>123</b>
<b>City Cash Position in 2048</b>	<b>1,989</b>	<b>2,157</b>	<b>168</b>
<b>Meets Funding Covenants/Is affordable?</b>	<b>TRUE</b>	<b>TRUE</b>	<b>N/A</b>
<b>Millions CAD</b>			

The update of the plan has also looked at the total debt servicing requirements for the City including all services. The following chart shows that all City debt servicing as a percentage of own source revenues, as calculated on the Provincial debt limit basis, will be approximately the same as was reported in the July 2011 report. This update is also consistent with the ten year debt forecast that was included in the October 2012 Long Range Financial Plan (LRFP IV) update for Council. That update was prepared using all current debt issuance plans including debt issue plans for the Ottawa on the Move project, all transit projects including the OLRT project and for the City's share of the Lansdowne Park redevelopment project.

It should be noted that in the highly unlikely event that external funding sources, such as senior government grants and development charge revenues are not achieved, the City's debt servicing test for tax related debt service at 7.5 per cent of own source revenues may be exceeded, however, the City will still remain well within the Provincial debt service limits of 25 per cent for total debt service compared to own source revenues.

The City has ample debt servicing capacity to take on a project of this size. The Ministry of Municipal Affairs establishes guidelines limiting the amount of long-term debt and financial obligations that can be taken on by Ontario municipalities. Cities are limited to spending no more than 25 percent of their annual own source revenues to servicing debt. As of January 1, 2012, the City of Ottawa's existing low debt burden meant that it could take on another \$415 million per year in principal and interest repayments and still be within Provincial debt servicing limits. This debt servicing capacity would allow the City to borrow another \$5.2 billion repayable over 20 years at a 5 per cent interest rate. After taking into account the financial obligations associated with this procurement, as well as the financing required for previously authorized and unissued debt, an updated debt and obligation limit shows that the City still has \$3.4 billion in remaining debt capacity.



### Senior Governments Funding Agreements

In July of 2011, Council delegated the authority to the City Manager to conclude negotiations on the OLRT contribution agreements with the senior levels of government and further delegated authority to the Mayor to execute the final agreements. A Provincial funding agreement has been executed. The Federal agreement is in the process of being finalized. Details of the Provincial agreement are included in this report.

This report recommends that Council continue to delegate the authority to the Mayor and City Manager to finalize agreements, and any required amendments, to the Federal and Provincial contribution agreements.

The City signed a Provincial funding agreement in September 2011. The Province has committed to funding \$600 million of eligible costs for this project. The September 2011 Provincial contribution agreement included a provision that the Province would fund a proportionate share of approximately 28 percent toward the costs of this project. Since that time, negotiations have continued with both the Provincial and Federal Governments to secure a funding plan that advances senior government funding for the project on an accelerated basis. The Provincial Government has recently confirmed its commitment to remitting up to 40 per cent of eligible costs on funding claims made, rather than its proportionate share of about 28 per cent. The maximum funding will remain at \$600 million of provincial eligible costs. An amendment to the Provincial Contribution Agreement is required in order to reflect this accelerated payment profile.

The Federal funding agreement is expected to be finalized prior to Council approval of the Project Agreement. Similarly, the Federal Government is expected to remit up to 40 per cent of each funding claim made, to a maximum of \$600 million and 33 per cent of Federal eligible costs.

These funding agreements will be amended further at financial close of the transaction to reflect the relative cost share between all three governments.

The City has also entered into an agreement with the Provincial Government regarding the transfer of funds to the City required for the Highway 417 widening contract which is being integrated with the OLRT construction works. Details of that agreement are included in this report.

## ACCESSIBILITY IMPACTS

The Ottawa Light Rail project has been designed to ensure the project meets the goals set out by Council. The project team is advancing implementation of an accessibility strategy.

The approved accessibility strategy identifies elements that are important to achieving universal accessibility standards in both station design and vehicles. The strategy includes a compliance review process for the detailed design development and the construction phase. The project team has worked with the accessibility community to incorporate accessibility features into the detailed design work that has occurred to date. This project is designed to comply with the [Ontario Building Code](#) and to the greatest extent possible with the new *City of Ottawa Accessibility Design Standards*.

It is important to note that the City of Ottawa's conventional and specialised transportation services are federally or independently regulated and therefore the AODA, a provincial statute, is not applicable. Nevertheless, the City's Light Rail project is committed to meeting the spirit and intent of the AODA. In keeping with this commitment, the project team has included accessibility features into the planning and design of this project to date.

Examples of specific accessibility features planned for the Ottawa Light Rail project include, but are not limited to:

- Barrier-free path of travel to entrances of stations;
- Each vehicle includes four designated wheelchair areas for accessibility;
- The vehicle interior is designed with a 100 per cent low-floor passenger area and seating arrangement;
- Vehicle is designed to meet low noise performance standards both inside and outside of the train;
- All signs are bonded on the train with the International Symbol of Accessibility and are displayed on the exterior of each vehicle;
- The doors use auditory and visual warning signals to alert passengers when doors are closing. Each vehicle contains signs that indicate which seats are priority seats for persons with disabilities;
- All passengers have access to push buttons for access-door opening requests or to communicate with onboard staff in an emergency;
- The vehicle is equipped with seven dual leaf, 1300mm wide passenger access doors per side to optimize passenger accessibility and reduce the

- time it takes for passengers to enter/exit the vehicle under peak operating conditions;
- Signage available in symbol form and wayfinding signage that is accessible;
  - Accessible interior station environment features;
  - Elevator dimensions that allow for the turning radius for a mobility device and buttons and emergency controls that are mounted at accessible height; and,
  - Clear open sight lines as well as the reduction of passenger cross flows and turn back movements are underlying principles of the design that make passenger wayfinding simple and intuitive.

## TECHNOLOGY IMPLICATIONS

Information Technology Services (ITS) will work with the Rail Implementation Office to develop detailed work plans and business cases for technology initiatives that may be required to support Ottawa Light Rail Transit project implementation. The work plans and business cases where required, would be elevated and approved through the City's ITS Intake process for all new technology requests.

## TERM OF COUNCIL PRIORITIES

The recommendations contained herein directly and indirectly support the following objectives of the Corporate Planning Framework:

- |     |                                                                                |
|-----|--------------------------------------------------------------------------------|
| EP1 | Promote Ottawa globally                                                        |
| EP3 | Support growth of local economy                                                |
| TM1 | Ensure sustainable transit services                                            |
| TM2 | Maximize density in and around transit stations                                |
| TM3 | Provide infrastructure to support mobility choices                             |
| TM4 | Promote alternative mobility choices                                           |
| ES3 | Reduce environmental impact                                                    |
| HC1 | Achieve equity and inclusion for an aging and diverse population               |
| SE2 | Improve operational performance                                                |
| GP1 | Improve the public's confidence in and satisfaction with the way Council works |
| FS1 | Align strategic priorities to Council's tax and user fee targets               |
| FS2 | Maintain and enhance the City's financial position                             |

## SUPPORTING DOCUMENTATION

- Appendix 1 – Station Technical Overview
- Appendix 2 – Legal Overview
- Schedule 1 – Phase 2 Expropriations
- Schedule 2 – Phase 3 Expropriations
- Schedule 3 – Noise By-Law Amendment

## DISPOSITION

Subject to Council approval, staff will implement the recommendations as outlined in the report.

Subject to Council approval, the relevant expropriation by-laws described in this report and appended in draft form will be completed and placed directly on the Council Agenda.

It is anticipated that the amendments to the Official Plan, the Zoning By-law and other legislative requirements outlined in the report will be placed on the appropriate Committee and Council agendas in early 2013.

The Deputy City Manager, Planning and Infrastructure, will ensure status updates on the project are provided to Committee and Council as warranted and outlined in this report.