

**6. STAGE 2 LIGHT RAIL TRANSIT (LRT) ENVIRONMENTAL ASSESSMENT  
AND FUNCTIONAL DESIGN REPORT**

**RAPPORT SUR L'ÉVALUATION ENVIRONNEMENTALE ET LA  
CONCEPTION FONCTIONNELLE DE L'ÉTAPE 2 DU PROJET DE TRAIN  
LÉGER**

**COMMITTEE RECOMMENDATIONS AS AMENDED**

**That Council:**

- 1. Approve the functional design for the Stage 2 Light Rail Transit (LRT) project as described in this report and detailed in Documents 1,2 and 3;**
- 2. Direct staff to complete the Stage 2 LRT Project Stage 2 LRT Environmental Assessment process and documentation based on the functional design and file the respective Environmental Study Reports in accordance with the Ontario Transit Regulation 231/08;**
- 3. Approve the functional design of the Highway 174/Prescott Russell Road 17 (Hwy 417/Split to Trim Road) Environmental Assessment Study recommendations, as described in Document 2 of this report;**
- 4. Approve a capital budget transfer of \$7M in existing funding from the Park and Ride Capital Account # 903278 to the Stage 2 LRT Project (Account # 907926) for the Stage 2 LRT Project preliminary implementation activities as described in this report;**
- 5. Delegate authority to the City Manager and Mayor to engage with the Federal and Provincial Governments on funding for the Stage 2 LRT Project to maximize their contribution to the project;**

6. Direct staff to undertake a review of upcoming City and senior government planned infrastructure works for potential bundling opportunities as part of the Stage 2 Project Contract; and,
7. Approve the Business Case document as summarized in their report and attached as Document 7; and,
8. Direct Stage 2 Office staff to explore structuring the Stage 2 LRT Project procurement documents to incent achieving Trillium Line revenue service sooner than the estimated 2023 timeline; and,
9. Direct staff to fully assess the feasibility and relative priority of rapid transit investment in the west and develop an option to provide a rapid transit rail solution to Kanata at the earliest opportunity, respecting the affordability model established within the 2011 LRFP for Transit, and that this work inform the Transportation Master Plan update and including a review of projects currently within the Affordable RTTP Network.

#### RECOMMANDATIONS MODIFIÉES DU COMITÉ

Que le Conseil :

1. Approuve la conception fonctionnelle pour l'étape 2 du projet de train léger, comme le décrit le présent rapport et l'expliquent en détail les Documents 1, 2 et 3;
2. Demande au personnel de réaliser l'évaluation environnementale de l'étape 2 du projet du train léger et de rédiger les documents connexes, en fonction de la conception fonctionnelle, et de soumettre les rapports d'étude environnementale conformément au Règlement de l'Ontario 231/08 sur le transport en commun;
3. Approuve la conception fonctionnelle liée aux recommandations de l'étude d'évaluation environnementale sur la route 174 et la route 17 de Prescott-Russell (embranchement de l'autoroute 417 menant au chemin Trim), comme le décrit le Document 2 du présent rapport;

4. Approuve un virement de fonds d'immobilisations totalisant 7 millions de dollars, du compte des parcs-o-bus n° 903278 au compte de l'étape 2 du projet de train léger (n° 907926), pour financer les activités préliminaires de mise en œuvre, comme le décrit le présent rapport;
5. Délègue au directeur municipal et au maire l'autorité de discuter avec les gouvernements provincial et fédéral du financement de l'étape 2 du projet de train léger, pour maximiser leur contribution à ce projet;
6. Demande au personnel d'examiner les travaux d'infrastructure prévus par la Ville et les gouvernements provincial et fédéral, pour voir s'il y aurait possibilité de regrouper certains travaux dans le cadre du contrat pour l'étape 2 du projet;
7. Approuve le document de présentation des avantages, comme le résume le rapport du personnel, joint en tant que Document 7; et,
8. Dirige le personnel du bureau de la deuxième étape d'examiner la possibilité de structurer les documents sur l'approvisionnement de l'Étape 2 du projet de train léger de manière à favoriser la commercialisation de la Ligne Trillium plus tôt qu'en 2023, comme il était prévu au départ.
9. Dirige le personnel de procéder à une évaluation globale de la faisabilité et du degré de priorité relatif d'un investissement dans le transport en commun rapide dans l'ouest et d'élaborer dans les meilleurs délais une solution de transport en commun rapide sur rail vers Kanata, qui respecte le modèle d'accessibilité financière établi dans le PFLT de 2011 pour le transport en commun, et que ce travail soit pris en compte dans la mise à jour du Plan directeur des transports, notamment dans l'examen des projets actuels de réseau de transport en commun rapide et de transport en commun prioritaire abordable.

DOCUMENTATION / DOCUMENTATION

1. Nancy Schepers, Executive Advisor, Light Rail Planning and Implementation report dated 22 June 2015 / Conseillère principale, Planification et mise en oeuvre du train léger, rapport daté du 22 juin 2015 (ACS2015-CMR-OCM-0017)
2. Extract of Draft Minutes, Finance and Economic Development Committee, 29 June 2015. / Extrait de l'ébauche du procès-verbal du Comité des finances et du développement économique, le 29 juin 2015.

**FINANCE AND ECONOMIC  
DEVELOPMENT COMMITTEE  
REPORT 6  
8 JULY 2015**

**218**

**COMITÉ DES FINANCES ET DU  
DÉVELOPPEMENT ÉCONOMIQUE  
RAPPORT 6  
LE 8 JUILLET 2015**

**Report to  
Rapport au:**

**Finance and Economic Development Committee  
Comité des finances et du développement économique  
29 June 2015 / 29 juin 2015**

**and Council  
et au Conseil  
8 July 2015 / 8 juillet 2015**

**Submitted on June 22, 2015  
Soumis le 22 juin 2015**

**Submitted by  
Soumis par:**

**Nancy Schepers, Executive Advisor, Light Rail Planning and Implementation/  
Conseillère principale, Planification et mise en oeuvre du train léger**

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Personne ressource:**

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léger**

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**Ward: CITY WIDE / À L'ÉCHELLE DE LA VILLE      File Number: ACS2015-CMR-OCM-0017**

**SUBJECT: STAGE 2 LIGHT RAIL TRANSIT (LRT) ENVIRONMENTAL  
ASSESSMENT AND FUNCTIONAL DESIGN REPORT**

**OBJET:      RAPPORT SUR L'ÉVALUATION ENVIRONNEMENTALE ET LA  
                 CONCEPTION FONCTIONNELLE DE L'ÉTAPE 2 DU PROJET DE  
                 TRAIN LÉGER**

**REPORT RECOMMENDATIONS**

**That the Finance and Economic Development Committee recommend Council:**

- 1.      Approve the functional design for the Stage 2 Light Rail Transit (LRT) project as described in this report and detailed in Documents 1,2 and 3;**
- 2.      Direct staff to complete the Stage 2 LRT Project Stage 2 LRT Environmental Assessment process and documentation based on the functional design and file the respective Environmental Study Reports in accordance with the Ontario Transit Regulation 231/08;**
- 3.      Approve the functional design of the Highway 174/Prescott Russell Road 17 (Hwy 417/Split to Trim Road) Environmental Assessment Study recommendations, as described in Document 2 of this report;**
- 4.      Approve a capital budget transfer of \$7M in existing funding from the Park and Ride Capital Account # 903278 to the Stage 2 LRT Project (Account # 907926) for the Stage 2 LRT Project preliminary implementation activities as described in this report;**
- 5.      Delegate authority to the City Manager and Mayor to engage with the Federal and Provincial Governments on funding for the Stage 2 LRT Project to maximize their contribution to the project;**
- 6.      Direct staff to undertake a review of upcoming City and senior government planned infrastructure works for potential bundling opportunities as part of the Stage 2 Project Contract; and,**
- 7.      Approve the Business Case document as summarized in their report and attached as Document 7.**

## **RECOMMANDATIONS DU RAPPORT**

**Que le Comité des finances et du développement économique recommande au Conseil :**

- 1. d'approuver la conception fonctionnelle pour l'étape 2 du projet de train léger, comme le décrit le présent rapport et l'expliquent en détail les Documents 1, 2 et 3;**
- 2. de demander au personnel de réaliser l'évaluation environnementale de l'étape 2 du projet du train léger et de rédiger les documents connexes, en fonction de la conception fonctionnelle, et de soumettre les rapports d'étude environnementale conformément au Règlement de l'Ontario 231/08 sur le transport en commun;**
- 3. d'approuver la conception fonctionnelle liée aux recommandations de l'étude d'évaluation environnementale sur la route 174 et la route 17 de Prescott-Russell (embranchement de l'autoroute 417 menant au chemin Trim), comme le décrit le Document 2 du présent rapport;**
- 4. d'approuver un virement de fonds d'immobilisations totalisant 7 millions de dollars, du compte des parcs-o-bus n° 903278 au compte de l'étape 2 du projet de train léger (n° 907926), pour financer les activités préliminaires de mise en œuvre, comme le décrit le présent rapport;**
- 5. de déléguer au directeur municipal et au maire l'autorité de discuter avec les gouvernements provincial et fédéral du financement de l'étape 2 du projet de train léger, pour maximiser leur contribution à ce projet;**
- 6. de demander au personnel d'examiner les travaux d'infrastructure prévus par la Ville et les gouvernements provincial et fédéral, pour voir s'il y aurait possibilité de regrouper certains travaux dans le cadre du contrat pour l'étape 2 du projet;**
- 7. d'approuver le document de présentation des avantages, comme le résumé le rapport du personnel, joint en tant que Document 7.**

## **EXECUTIVE SUMMARY**

On November 26, 2013 Council unanimously approved the City's 2013 Transportation Master Plan (TMP) ([link](#)) which set out the City's priority for transit and transportation infrastructure investments until 2031. A major component of the TMP was the Stage 2 LRT plan, a package of three rail extensions that builds on the current Confederation and Trillium Line investments to add 30 kilometres of track and 19 new stations farther east, west and south.

Transportation Committee approved the statements of work for the Planning and Environmental Assessment (EA) studies for each of the three Stage 2 LRT Project extensions in February of 2014, including:

- Trillium Line extension from Greenboro Station to Bowesville Road, including the exploration of an Airport Rail Link;
- Confederation Line West extension from Tunney's Pasture to Baseline and Bayshore Station. This particular scope of work modified the boundaries of an EA already underway; and,
- Confederation Line East extension from Blair to Place d'Orléans Station. This study was bundled with the Highway 174 widening EA study, and also looked at a potential extension to Trim Road.

These studies confirm the functional design of the alignment and stations for each of the three extensions, including a description of the physical footprint, ridership capacity, operational features, cycling and pedestrian connections, bicycle parking, station characteristics, and potential environmental impacts and mitigation needed for each. A description of the entire Stage 2 LRT Project alignment from west to east and north to south is included in this report.

An analysis of options for an LRT Maintenance and Storage Facility (MSF) was also in the Confederation Line West and Trillium Line extension studies. For the Trillium Line, it was determined that the additional vehicles required can be accommodated at an expanded Walkley Yard facility. Nineteen potential sites for the Confederation Line were examined, and the analysis determined that two sites were capable of meeting the



ultimate requirements for the line: the first at Woodroffe, and the second at an expanded Belfast MSF facility.

As part of the current functional design, the EA process has identified the need for approximately 45 parcels of private and public land along the alignment.

The EA studies also provide updated cost estimates for the three extensions, and the work done to date confirms the \$3B cost estimates originally identified in the 2013 TMP.

While outside of the TMP Affordable Network, the EA studies provide functional designs for an Airport Rail Link and extension of the Confederation Line East from Place D'Orléans to Trim Road. The cost estimate for the Airport Link is \$155 million, and \$160 million (dollars escalated to time of spend) for the extension to Trim Road.

In order to maximize transit ridership, to capitalize on the recent federal and provincial funding announcements and to derive all the project benefits described in this report as early as possible, the Stage 2 LRT Project schedule is based on achieving an overall revenue service date of 2023.

This report recommends that to achieve this schedule, preparatory work needs to be undertaken in 2015 and 2016, including securing federal and provincial funding sources, developing a procurement option analysis report and beginning Preliminary Engineering Design Work.

The report further recommends that in context of the recent creation of new federal and provincial transit infrastructure funds, staff work with the federal and provincial governments to secure the maximum funding contribution towards the Stage 2 LRT Project.

### **FINANCIAL IMPLICATIONS**

This report recommends that additional capital expenditures related to advancing and securing the Stage 2 LRT Project (Account # 907926) in the amount \$7M be provided by way of a capital budget transfer from existing available transit capital budget funds in Park and Ride Account # 903278.

In October 2013, as a companion to the TMP report, the City Treasurer tabled a report on the Affordability of the Transportation Master Plan, Ottawa Pedestrian Plan and

Ottawa Cycling Plan (ACS2013-CMR-FIN-0038) ([link](#)). This report discussed the affordability of the new TMP, Cycling Plan and Pedestrian plans - which included Ottawa's Stage 2 LRT Project. The report also looked at transit operational requirements and capital renewal requirements and the capacity to fund further transit infrastructure projects beyond 2031 in order to assess the full impact of the TMP transit recommendations on the City's financial sustainability.

The report concluded that the City could afford to implement the Stage 2 LRT Project contingent on: each senior government providing a one third share of total eligible construction costs; that changes to Development Charges in relation to transit be adopted by the province; and that transit fares and transit taxes continue to be aligned to the rate of inflation affecting transit costs. Once the details of the 2015 announcements regarding new federal and provincial transit funding program are determined a full review of the inputs and assumptions that make up the affordability model will be revisited and a report updating the model will be presented to Council.

## **RÉSUMÉ**

Le 26 novembre 2013, le Conseil a approuvé à l'unanimité la mise à jour de 2013 du *Plan directeur des transports* (PDT) de la Ville ([lien](#)), qui recense les investissements prévus dans le transport en commun et les infrastructures de transport jusqu'en 2031. L'un des éléments importants du PDT est la phase 2 du projet de train léger sur rail (TLR), un ensemble de trois projets de prolongement de la voie ferroviaire qui visent à ajouter 30 kilomètres de rails et 19 stations au réseau vers l'est, l'ouest et le sud, dans la foulée des investissements dans la Ligne de la Confédération et la Ligne Trillium.

Le Comité des transports a approuvé les énoncés des travaux des études de planification et d'évaluation environnementale (EE) pour les trois étapes de la phase 2 des projets de prolongement du train léger en février 2014, soit :

- le prolongement de la Ligne Trillium de la station Greenboro au chemin Bowesville, et la considération d'une liaison avec l'aéroport;
- le prolongement vers l'ouest de la Ligne de la Confédération du pré Tunney jusqu'aux stations Baseline et Bayshore. Cet énoncé des travaux modifie les limites d'une EE en cours;

- le prolongement vers l'est de la Ligne de la Confédération, de la station Blair à la station Place d'Orléans. Cette étude a été jointe à l'EE sur l'élargissement de la route 174 et porte également sur la possibilité de prolonger le tronçon jusqu'au chemin Trim.

Ces études ont permis de confirmer la conception fonctionnelle du tracé et des stations des trois prolongements, et comprennent des détails sur l'empreinte écologique, les plateformes, la capacité en nombre d'usagers, les caractéristiques opérationnelles, les voies pour piétons et cyclistes et les caractéristiques de chacune des stations. Le rapport contient par ailleurs une description de tous les tracés de la phase 2 du train léger (d'est en ouest et du nord au sud).

En outre, une analyse des options pour la mise en place d'installations d'entretien et de remisage du train léger a été réalisée dans les études portant sur le prolongement vers l'ouest de la Ligne de la Confédération et le prolongement de la Ligne Trillium. En ce qui concerne la Ligne Trillium, on a déterminé que les véhicules supplémentaires requis pourraient être remisés dans la nouvelle installation de la cour de triage Walkley. Pour la Ligne de la Confédération, 19 sites potentiels ont été évalués, après quoi il a été établi que deux de ces sites étaient en mesure de répondre aux besoins prioritaires de la ligne : le premier se situe sur l'avenue Woodroffe, et le second est l'installation de remisage et d'entretien agrandie du chemin Belfast.

Tenant compte de la conception fonctionnelle actuelle, le processus d'EE révèle la nécessité d'aménager environ 45 parcelles de terrains privés et publics le long du tracé.

Les EE comprennent une mise à jour de l'estimation des coûts liés aux trois prolongements. Les travaux déjà effectués dans le cadre de ce projet confirment l'estimation de coûts de trois milliards de dollars avancée dans le PDT 2013.

Bien qu'elles sortent du cadre du réseau abordable du PDT, les EE présentent les conceptions fonctionnelles d'une liaison avec l'aéroport et du prolongement vers l'est de la Ligne de la Confédération jusqu'au chemin Trim. On estime que ces travaux coûteraient respectivement 155 millions et 160 millions de dollars.

Pour optimiser la fréquentation du réseau de transport en commun, tirer parti du financement annoncé récemment par les gouvernements fédéral et provincial et profiter pleinement et dès que possible des avantages décrits dans le présent rapport, le

calendrier de projet de l'Étape 2 du train léger sur rail est fondé sur une mise en service rémunéré complet en 2023.

Afin de respecter cet échéancier, le rapport recommande que les travaux préparatoires soient entrepris en 2015 et en 2016, notamment l'obtention du financement de la part des gouvernements fédéral et provincial, l'élaboration d'un rapport d'analyse sur les options d'approvisionnement et le début des travaux de conception préliminaires.

Le rapport recommande aussi, compte tenu de la création récente de nouveaux fonds d'infrastructure pour le transport en commun par les gouvernements fédéral et provincial, que le personnel collabore avec ces deux ordres de gouvernement afin d'obtenir une contribution maximale au financement de l'Étape 2 du train léger sur rail

### **RÉPERCUSSIONS FINANCIÈRES**

Le présent rapport recommande que la somme supplémentaire de \$7M soit versée au compte de l'étape 2 du projet (no 907926) et que cette somme soit puisée du fonds d'immobilisations existant pour le transport en commun, dans le compte des parcs-o-bus (no 903278).

En octobre 2013, le trésorier municipal a présenté, avec le rapport du Plan directeur des transports, un rapport sur l'abordabilité du Plan directeur des transports, du Plan de la circulation piétonnière d'Ottawa et du Plan sur le cyclisme d'Ottawa (ACS2013-CMR-PFSNA-0038) ([lien](#)). Ce rapport porte sur la viabilité financière des nouvelles versions de ces trois plans, dont fait partie l'étape 2 du projet d'Ottawa. Il aborde également la question des exigences du transport en commun en ce qui concerne le fonctionnement et le renouvellement des immobilisations, ainsi que la capacité de la Ville à financer d'autres projets d'infrastructure de transport en commun après 2031, afin d'évaluer tout l'effet qu'auront les recommandations relatives au transport en commun du Plan directeur des transports sur la viabilité financière de la Ville.

Selon le rapport, la Ville peut se permettre de mettre en œuvre l'étape 2 du projet, pourvu que le gouvernement provincial et le gouvernement fédéral couvrent chacun un tiers de toutes les dépenses de construction admissibles, que la province apporte des changements aux redevances d'aménagement en lien avec le transport en commun, et que les taxes et les tarifs relatifs au transport en commun continuent d'être indexés à l'inflation dans ce domaine. Dès que sera révélé le fond des déclarations de 2015

concernant les nouveaux programmes provinciaux et fédéraux de financement du transport en commun, une évaluation complète des facteurs et des hypothèses qui influencent le modèle d'abordabilité sera effectuée, et un rapport sur la mise à jour du modèle sera présenté au Conseil.

## **BACKGROUND**

On November 26, 2013 Council unanimously approved the City's 2013 Transportation Master Plan (TMP) ([link](#)) which set out the City's priority for transit and transportation infrastructure investments until the end of the planning horizon – 2031.

Specifically, the TMP identifies transportation facilities and services the City needs to support the Official Plan's vision and growth management strategies. These plans provide direction to the City's day-to-day transportation programs, budgets and long-range financial plans by identifying transportation infrastructure, policies and programs.

As part of what it identified as the Affordable Rapid Transit and Transit Priority (RTTP) Network, the 2013 TMP included a significant vision for LRT throughout the city called Stage 2. Building on the Confederation Line project currently under construction, the Stage 2 LRT plan is a package of three extensions that together will extend light rail transit farther east, west and south in the city. Specifically, the plan will extend rail to Baseline and Bayshore in the west (Confederation Line West extension), Place d'Orléans in the east (Confederation Line East extension), and to Bowesville in the south (Trillium Line extension). Stage 2 will add 30 kilometers of rail and 19 new stations and provide better connections to retail, educational, employment, and cultural destinations as well as recreational opportunities across the city. Upon completion, approximately 70% of Ottawa residents will be within 5 km of the comfort, convenience and reliability of light rail service. These extensions will also be beneficial to residents living outside of Ottawa, as they will have better access to the public transit system.

The 2013 TMP's Affordable Network also included a number of (at-grade and grade-separated) BRT extensions, including the West Transitway (from Bayshore Station to west of Moodie Drive, and a second extension from March Road to Terry Fox Station), the Baseline Transit Corridor (from Baseline to Heron stations), and the Kanata North Transitway (from Corkstown Road to Solandt Road), as well as an additional \$200

million in transit priority projects to be implemented by 2031. This report focuses solely on the Stage 2 LRT Project as a single package.

### **Environmental Assessments**

Subsequent to Council's approval of the TMP, Transportation Committee approved the statements of work ([link](#)) for the EAs for the three Stage 2 LRT Project extensions, including:

- Trillium Line extension from Greenboro Station to Riverside South (Bowesville Road). This study also included within the scope of work an Airport Rail Link (outside of what was identified in the TMP Affordable Network);
- Confederation Line West extension from Tunney's Pasture Station to Baseline Station and Bayshore Station. This particular EA scope of work modified the boundaries of an EA that was already underway; and,
- Confederation Line East extension from Blair to Place d'Orleans Station. This study was bundled with the Highway 174 widening EA study, and also included within the scope of work an extension to Trim Road (outside of what was identified in the TMP Affordable Network).

This report will provide the functional design and updated cost estimates for the three extensions as outlined above, and request Council's approval to file the EAs.

### **Confederation Line Project**

The Stage 2 LRT Project is an extension of the City's Confederation Line project currently under construction. The Confederation Line is a \$2.15B, 12.5km LRT project that runs from Tunney's Pasture Station in the west to Blair Station in the east, while traversing the downtown via a 2.5 km tunnel. Cost-shared among the City and our two senior levels of government, the Confederation Line project is Ottawa's first electric LRT investment which will alleviate the downtown bottleneck that is constraining transit ridership growth. It was designed and is being constructed to meet the 18,000 people per hour per direction (pphpd) ridership levels projected for 2031, and with small modifications to meet a 24,000 pphpd maximum ridership (a ridership level not anticipated until well beyond the City's long-term planning horizon.)

The Confederation Line was procured and is being designed and constructed by the Rideau Transit Group (RTG) as a Design Build Finance Maintain, Private Public Partnership (P3) project, which is alternatively called Alternative Financing and Procurement (AFP). This procurement approach, which required RTG to provide \$300M towards project construction to be repaid over a 30 year maintenance term, ensures that project design and construction risk is appropriately allocated between the City and private sector. This risk transfer resulted in a fixed price and guaranteed schedule for project delivery.

The Confederation Line project is into its third year of construction. The first years of construction have focused on the Maintenance and Storage Facility at Belfast Yards, and tunnel construction. The project is on schedule for construction completion in late 2017 and commissioning in spring of 2018.

### **Affordability of the City's Transportation Master Plan**

In October 2013, as a companion to the TMP, the City Treasurer tabled a report on the Affordability of the Transportation Master Plan, Ottawa Pedestrian Plan and Ottawa Cycling Plan (ACS2013-CMR-FIN-0038) ([link](#)). This report discussed the affordability of the new TMP, Cycling Plan and Pedestrian plans - which included Ottawa's Stage 2 LRT Project. The report also looked at transit operational requirements and capital renewal requirements and the capacity to fund further transit infrastructure projects beyond 2031 in order to assess the full impact of the TMP transit recommendations on the City's financial sustainability.

The report concluded that the City could afford to implement the Stage 2 LRT Project contingent on: each senior government partner providing a one third share of total eligible construction costs; that changes to Development Charges in relation to transit be adopted by the province; and that transit fares and transit taxes continue to be aligned to the rate of inflation affecting transit costs. As a full review of the inputs and assumptions that make up the affordability model have not been revisited since 2013 and since details as to the 2015 announcements regarding new federal and provincial transit funding programs remain outstanding, the model will be updated. This updated affordability analysis will be provided to Council once the federal and provincial contributions on Stage 2 and their implications on the overall model have been determined.

## **DISCUSSION**

### **STAGE 2 LRT FUNCTIONAL DESIGN**

#### **Environmental Assessment Process and Status**

With its unanimous approval of the 2013 TMP, Council prioritized the implementation of the Stage 2 LRT Project as the next phase of rail investment in the city.

The Stage 2 LRT Project builds on the City's Confederation Line investment by adding 30 new kilometres of rail to the east, west and south of the O-Train system. By 2023, Stage 2 will bring close to 70% of residents within 5 km of an LRT station and connect communities east, west, and south in the city.

While the Stage 2 LRT Project is made up of three extensions with three separate EAs, the individual projects show best value when consolidated as a single project as it maximizes ridership capture, builds on the Confederation Line investments and creates economies of scale for the construction program. Recognizing this, the federal and provincial funding requests, the procurement analysis, the project business case and preliminary engineering activities, outlined in sections below, will all proceed with the assumption that Stage 2 LRT Project is a consolidated project with a single budget to ensure full value capture and concurrent implementation.

In February 2014, Transportation Committee approved the Statements of Work ([link](#)) and changes to study scope for the three Stage 2 LRT Project extensions as described in the following documents:

- Trillium Line Extension and Airport Rail Link;
- Confederation Line East Extension (including Trim Road); and,
- Confederation Line West Extension.

All three planning and environmental assessment studies follow Ontario's Transit Project Assessment Process (TPAP), Regulation 231/08. Upon Council approval of the three functional designs, the entire planning process to-date, including an assessment of all environmental impacts and public consultations, will be documented in an Environmental Project Report (EPR) for each project.



The EAs also include a review of select corridors that were identified as outside of the City's Affordable Network but remain part of the City's Network Concept in the TMP. These include the Airport Link, an extension of the Confederation Line East extension from Place d'Orléans to Trim Road, and the Highway 174 widening. The recommended approach for the potential implementation of both the Airport Link and the Trim Road extension are included in the body of this report.

As the design of the Confederation Line East LRT extension and the design of the widening of the western section of Highway 174 (between Blair and Trim) are interdependent, the functional design work has proceeded on both elements and it is included in the Confederation Line East Functional Design Report (Document 2) for approval.

The Confederation Line East LRT Extension will be submitted to the Province subsequent to Committee and Council approving the functional design and directing staff to proceed with the TPAP process. Later this year, the design of the eastern portion of the Highway widening from Trim, to the City's eastern study limit at Canaan Road, will be presented to Committee and Council and bundled with the western segment presented in this report and will be submitted to the Province subsequent to Committee and Council receiving this information and directing staff to proceed with the Schedule 'C' environmental assessment.

The TPAP process for all three EA studies is expected to conclude by early 2016. It is estimated that all the Trillium Extension and Confederation Line West EAs will be approved by the end of 2015, and the Confederation Line East EA by mid 2016, given the latter project's coordination with the Highway widening study.

### **Project Design and Common Design Elements**

The sections below describe the functional design of the three Stage 2 LRT Project extensions, including the Airport Link and the Trim Road extension. These descriptions, which are supplemented by design drawings in appendices to the report, are intentionally high level in order to give maximum flexibility to the preliminary engineering team and the winning design build Project Proponent (hereafter referred to in this report as "Project Co."). A key lesson learned from the Confederation Line project is that best

value is achieved when Project Co. is given maximum flexibility to meet performance outcomes.

*Station Design and Wayfinding:*

The Confederation Line station designs establish consistent and recognizable architecture that deliver quality, passenger comfort and resilience while maintaining affordability now and for future extensions.

Each station is tailored to its location in order to integrate with its surroundings through its own architectural treatment. Overall, 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 Stage 2 LRT Project will build on the Confederation Line procurement process that resulted in these station designs. Stage 2 will be procured to ensure a similar look and feel to the Confederation Line stations throughout the expanded east-west system. This will include the integration of some of the signature Confederation Line design elements as appropriate determined in part by size and ridership volume of station. Elements, such as roof, windscreen, wayfinding and signage, vertical circulation elements and passenger amenities will be dictated in the procurement documentation to ensure the desired outcomes, and achieve maximum value while preserving flexibility for innovation to the bidding proponents.

Trillium Line stations will carry over accessibility and safety features as well as the wayfinding and signage system from the Confederation Line. Weather protection will be provided commensurate with expected passenger levels at the stations and be applied in a consistent manner across the line. New or expanded sheltered bicycle parking will be provided at all stations as well.

*Station Safety*

Stations will include CCTV cameras and emergency phones monitored by the Transit Services Control Centre. As well, stations will be designed to best practice CPTED principles (Crime Prevention Through Environmental Design). Life safety features to

support emergency services response and passenger evacuation will also be included in project design.

### *Station Accessibility*

The Stage 2 LRT Project extensions will incorporate and build on the accessibility standards for both the Confederation and Trillium Lines. The expanded vehicle fleets will continue to be accessible low-floor vehicles. Further, stations will be designed to meet universal accessibility requirements, including the Accessibility for Ontarians with Disabilities Act (AODA), the Ontario Building Code, and the updated City of Ottawa Accessibility Design Standards.

Where elevators and escalators are provided, redundant systems will be in place to ensure reliability. Where site constraints allow or where physically feasible; walkways and ramps will be used to provide a redundant means of vertical circulation in the event of mechanical failure of an elevator. Overall, the goal is to meet the highest level of accessibility by design to ensure people with disabilities and without, can use the facilities safely and equally.

This commitment to accessibility for Stage 2 will promote equality of services, meets the City's accessibility goals, provides transit to residents with a diverse range of abilities and improve the overall transit user experience. An accessible LRT network will also have economic benefits such as improved participation in labour markets, increased numbers of consumers for businesses and services and provide a more affordable transportation option than personal vehicle use.

### *Power Supply*

The Confederation Line project is powered by overhead catenary power system, which will remain the technology for the Confederation Line extensions. The Trillium line has diesel powered vehicles, which will remain the technology for the extension. The locations of the Traction Power Substations for the Confederation Line extensions will be established as the design advances.

### *Fare Control*

All new Stage 2 stations will include the same fare control model as is being procured for both O-Trains lines. This includes a designated fare paid zone controlled by barriers

and accessed by fare control gates. The procurement and installation of these gates will be overseen by Transit Services through a separate contract. As with the Confederation Line project, the Project Co will identify the locations, and ensure appropriate spacing and conduits for installation based on passenger flow models.

### *Vehicles*

Both the existing Trillium Line (Alstom Lint) and the Confederation Line (Alstom Citadis) system use Alstom vehicles that were procured through their respective competitive procurement processes. The City is currently undertaking a comprehensive review of the procurement options for Stage 2 to identify the best options to acquire the necessary vehicles while achieving the procurement objectives outlined in *Advancing Stage 2* section of this report.

## **Functional Design Descriptions**

### *Confederation Line West*

The Confederation Line West extension project will add 13.5 km of rail and ten new or converted rapid transit stations to the City's overall light rail transit (LRT) network at Bayshore, Pinecrest, Queensview, Baseline, Iris, Lincoln Fields, New Orchard, Cleary, Dominion and Westboro.

Between Tunney's Pasture and Dominion Station, the LRT alignment makes use of the existing West Transitway corridor, which is a below-grade (trench) facility located north of Scott Street.

Moving west from Dominion Station, the LRT alignment curves in an open cut and then enters into a tunnel running along south side of Sir John A Macdonald Parkway, under the relocated eastbound Parkway lanes, for approximately 1km to a fully underground Cleary Station also in the parkway corridor.

West of Cleary Station, the LRT alignment remains approximately 4-6 metres below-grade crossing under Cleary Avenue and through lands held by the First Unitarian Church and two other private businesses before it continues under Richmond Road to arrive at New Orchard Station located in a segment of the Byron Linear Park.

West of New Orchard Station, the underground LRT alignment curves north to re-enter the Richmond Road right-of-way and then continues northwest to set up the curve south into the NCC Parkway/Pinecrest Creek Corridor where it emerges from this tunnelled segment to continue at grade just south of the Richmond Road overpass.. The alignment then turns south and runs parallel to the Sir John A. Macdonald Parkway before entering Lincoln Fields Station.

South of Lincoln Fields, the alignment will pass through a junction, which will be located immediately south of Lincoln Fields Station, and is the point at which trains running to/from the east to Tunney's Pasture Station will join/split with tracks running south to Baseline Station and tracks running west to Bayshore Station.

South from this junction the alignment will be at-grade and generally follow the existing Southwest Transitway continuing along the creek corridor through a rebuilt Iris Station, and into the previously constructed underground tunnel structure south of Baseline Road, where it will terminate at Baseline Station.

The existing Transitway along the Pinecrest Creek Corridor will be decommissioned, and the asphalt road surface removed and converted to electric LRT as part of the extension of the Confederation Line. Bus ramps from the Southwest Transitway up to Highway 417 will also be eliminated and the area restored to a natural landscape designed to contribute to storm water management improvements.

Immediately west of the rail junction, the LRT alignment crosses over Pinecrest Creek (and the NCC's Capital Pathway that parallels it) on new bridge structures and then descends to enter into a new tunnel portal as it leaves the Pinecrest Creek Corridor. The LRT passes approximately 3 to 4 metres below grade at Connaught Avenue in a tunnel that is approximately 300 metres long and emerges south of the existing OC Transpo Queensview bus garage before rising up at a new Queensview Station. The alignment then runs parallel to the north side of Highway 417 where it slowly descends to pass under Pinecrest Road and the Highway 417 ramps. West of Pinecrest Road will be a relocated Pinecrest station and the alignment will make use of the existing West Transitway corridor on its way farther west to arrive at Bayshore Station where the Confederation Line West LRT extension will connect directly to the West Transitway facilitating easy transfers to and from the Transitway.

The following provides further details concerning the stations planned as a part of the Confederation Line West Functional Design as well as some of the other alignment features from Bayshore and Baseline to Tunney's Pasture, including a summary of the 100-Day Working Group process and results.

### *BAYSHORE STATION*

Bayshore Station, located at the existing Bayshore Transitway Station, will be the western terminus of the Confederation Line West extension. It will also be the eastern terminus of the West Transitway, a new BRT corridor running parallel to and just north of Highway 417 west of Bayshore to Moodie that will improve reliability and transit commute times for passengers commuting to/from farther west. Bayshore Station will be designed integrate with this \$41 million investment—scheduled to be in operation by 2017—by facilitating easy and efficient transfers to and from this major transfer point between LRT and BRT.

The recommended design will reuse much of the existing Bayshore Station infrastructure and occupy generally the same land area.

Existing Transitway roadway and platforms will be converted to accommodate LRT, while the local bus platforms will be reconfigured to serve rapid transit buses and allow for efficient and convenient cross-platform transfers. Station design and layout will also be compatible with the new West Transitway Extension (Bayshore to Moodie). Local buses will continue to access the station via Woodridge Crescent, with direct pedestrian access to the station from this street.

The northerly station building will be expanded to accommodate a fare-paid control zone where the existing overhead pedestrian walkway from Bayshore Shopping Centre connects into the station. Based on future mall plans, the overhead walkway may also be modified.

Additional station features include:

- An improved pedestrian/cycle link to Holly Acres Road and to Woodridge Crescent;
- Public washroom facilities; and,

- A bus staging area to the west of the station to facilitate short-term layover of buses

Station design remains flexible such that it can be integrated into future development of adjacent commercial and residential lands.

Other than a triangular piece of land required to facilitate bus movements at the station, no additional lands beyond those previously identified as part of the West Transitway Extension EA will be required.

Upon the approval of this report, staff will commence the detailed design for the at grade crossing at Holly Acres, pending the completion of the EA.

To accommodate the bus staging area at the west end of Bayshore Station, the grade-separated Transitway overpass across Holly Acres Road, recommended as part of the previous West Transitway Extension (Bayshore to Moodie) EA, would be deferred as an updated traffic and transit service analysis has determined that an at-grade crossing of Holly Acres is still viable until post-2031. Therefore, the existing at-grade Holly Acres Road/Bayshore intersection will be maintained with some modifications to permit two-way (east/west) bus traffic and to accommodate the Highway 417 westbound on-ramp from Holly Acres Road. The cost reductions associated with the decision to defer the grade separation were incorporated and reported in the 2015 Budget. This modification to the existing West Transitway Extension (Holly Acres to Moodie) will be documented as part of the Environmental Project Report for the Confederation Line Western Extension.

The sound attenuation walls that were identified by the Ministry of Transportation to be implemented as part of the West Transitway Extension (Holly Acres to Moodie) project to address highway noise remain part of the current project.

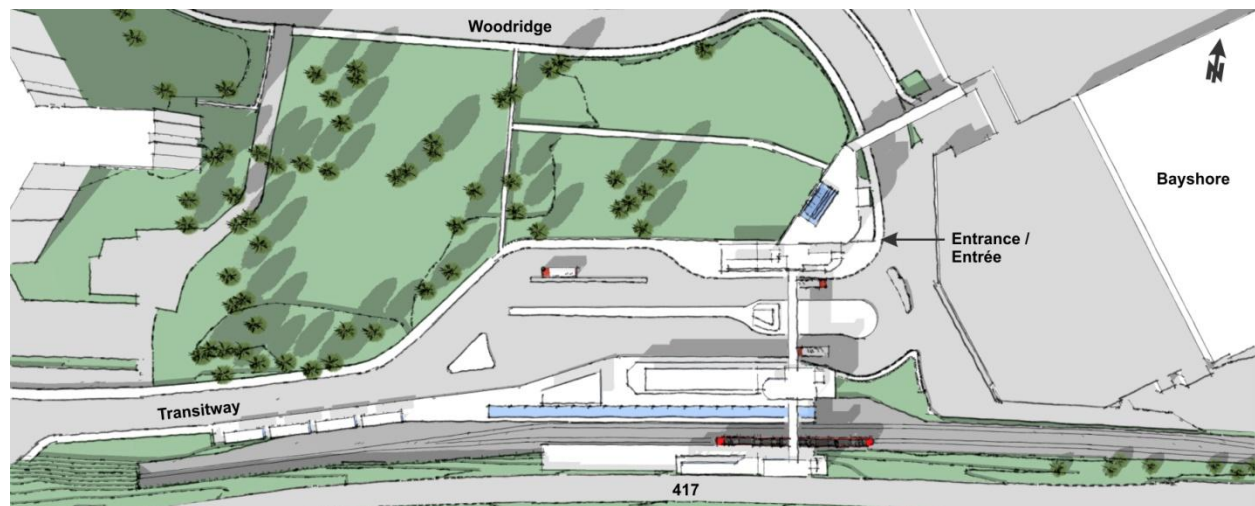


Figure 1: Plan view of Bayshore Station showing LRT and bus platforms and reuse of existing structures

### PINECREST STATION

The existing Transitway platforms will be decommissioned and the functional design shows a new LRT station with an open-air centre platform to be constructed in a cut below grade. From east of the station, access will be provided via pathways from the sidewalks and bus stops along Pinecrest Road – the east side pathway curving down and passing under Pinecrest Road along the LRT corridor. To the north and west, pathways to the Foster Farm community will provide pedestrian and cycling access.

Other station features include:

- Enhanced pedestrian and cycling connections from both sides of Pinecrest Road south from Dumarier Avenue and Queensview Drive;
- Improved pedestrian and cycling linkage over Highway 417 can be incorporated into the future replacement of the Pinecrest Road bridge when undertaken by MTO; and
- Informal passenger pick-up and drop-off areas on Dumaurier Avenue and in a small turn around accessed from Pinecrest Road.



The City will look for opportunities to coordinate works with MTO plans for widening and renewal of Highway 417. A small area of the provincially owned highway interchange lands will be required for the LRT station and alignment. In addition, the realignment of the intersection of the westbound highway on ramps at Pinecrest will be required to facilitate bus stops on Pinecrest to provide good connections for riders to the LRT station platforms.

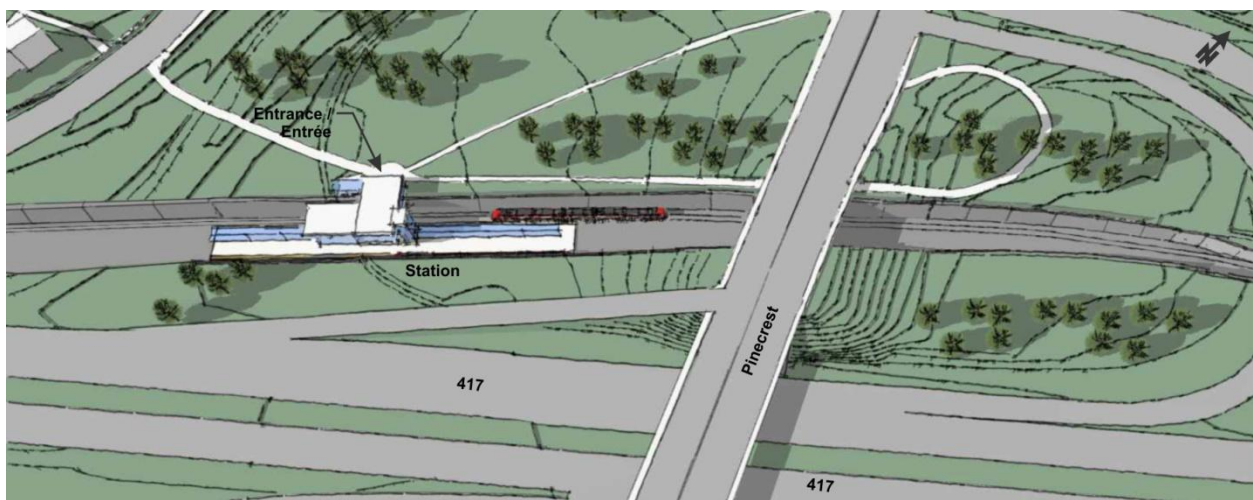


Figure 2: Plan view of Pinecrest Station north of Highway 417 and west of Pinecrest Avenue

### QUEENSVIEW STATION

Queensview Station will be a new LRT station to serve communities and businesses on the north and south sides of Highway 417. The functional design shows the station with an open-air centre platform with access at grade level via new pathway connections to Queensview Drive and Connaught Avenue.

Other features of this station include:

- A new multi-use pathway bridge crossing of Highway 417 to Baxter Road to provide residents in this area near Iris Street and the Pinecrest and Baxter Road business districts with access to the LRT station;
- Provision of accessible ramps, stairs and elevators from the station platform level to the pathway overpass; and,

- Provision of passenger pick-up and drop-off along Queensview Drive and Baxter Road.

Some narrow widths of lands will be required from adjacent commercial properties along Queensview Drive that back onto Highway 417. Property requirements in this area have been identified in previous environmental assessment studies for the West Transitway (Woodroffe to Bayshore). On the south side, the land requirements for the pathway overpass and access along Baxter Road can be accommodated within the right-of-way.

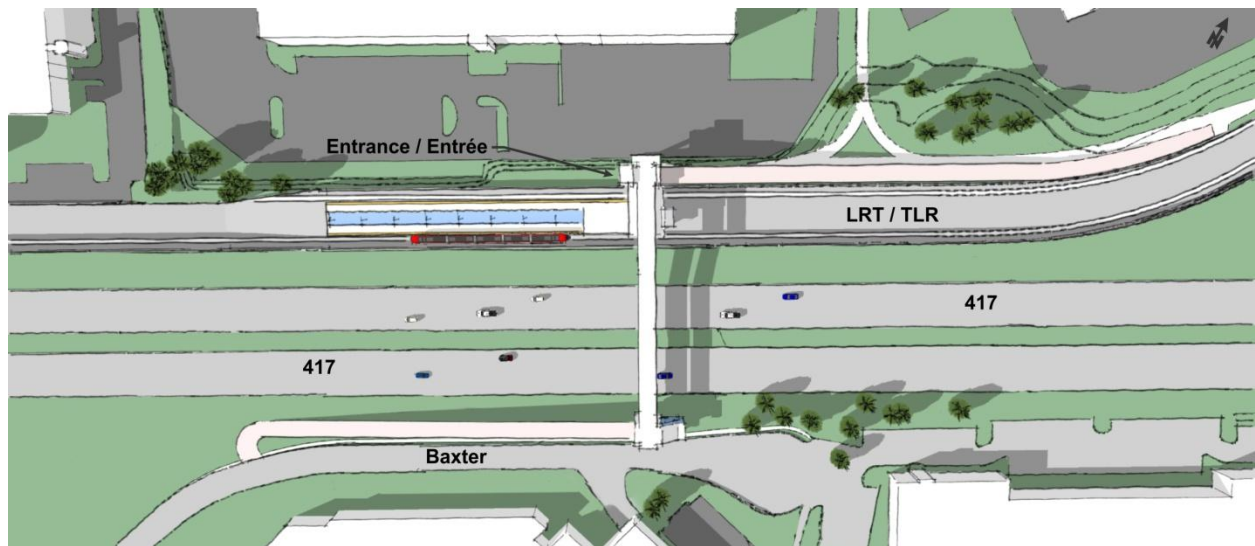


Figure 3: Plan view of Queensview Station showing pathway bridge over Highway 417

### BASELINE STATION

Baseline Station is the southwest terminus of Stage 2's Confederation Line West extension and is adjacent to the Algonquin College Campus in the Centrepoinette neighbourhood. As the northern terminus of the Southwest Transitway from Barrhaven, the station will operate as a major BRT/LRT transfer terminus.

A central LRT platform will be located below-grade in an existing tunnel structure between Navaho Drive and College Avenue, underneath the open plaza situated immediately west of the Algonquin College ACCE Building. An upper level bus terminal for the Southwest Transitway BRT/LRT transfer terminus will be constructed on the

south side of College Avenue, and will provide access to the lower level LRT platforms via stairs, escalators and elevators. Other key station features include:

- A new pathway connection along the east side of the LRT alignment north of Navaho Drive and under the Baseline Road overpass that will provide access between open spaces and mixed use development areas;
- Public washroom facilities;
- Creation of a new bus loop to facilitate bus connections to LRT. Buses will enter the bus loop from College Avenue and move in a clockwise direction at grade level. From this loop, passengers can take the stairs/escalators/elevators to the train platforms located below-grade in the Baseline Station tunnel;
- As part of a much larger urban intensification area, Baseline Station will support the Mixed-Use Centre designation and opportunities to create Transit-Oriented Development; and,
- The underground structure has the capacity to not only serve as an LRT station but as a vehicle storage and staging area. This would allow for storage of several LRT vehicles in a covered facility so they can be ready for early service start up for the peak periods

Based on the Rapid Transit Network identified in the City's 2008 Transportation Master Plan (TMP), the existing below-grade tunnel structure was designed and constructed to ultimately incorporate both BRT and LRT operations. An early outcome of the Western LRT EA saw the removal of the need to accommodate BRT operations in the below-grade tunnel in the long term, and further, with the accelerated Stage 2 program introduced as part of the City's 2013 TMP, any interim bus solution was recognized to have a limited lifespan, and was therefore not advanced beyond the functional planning stage.



Figure 4: Plan view Baseline LRT Station

### IRIS STATION

Iris Station is an existing Transitway station with basic platforms and shelters to the south and north of Iris Street between Parkway Drive and Adirondack Drive. The current at grade Southwest Transitway crossing at Iris Street will be eliminated as part of the conversion to LRT, and a new Iris Street overpass will replace the at grade crossings. The station and bridge design will make use of the natural terrain and elevations, creating a low impact design that fits into the natural and community context. The design will feature open air LRT platforms in the creek valley slightly below street level and a new long low Iris Street bridge passing over the LRT. Ramps will provide access to the station rather than elevators to minimize the station's visual impact, as well as construction and on-going operating costs.

Other station features include:

- Side platform configuration, with station entrances on both sides connected to Iris Street via ramps and stairs;
- Reduced overall footprint for the bridge design, with no property acquisition requirements;

- Bridge structure that will serve many modes and maintain pedestrian and cycling continuity along Iris Street, and to the Capital Pathway, and community links along the creek valley;
- Better definition of existing informal passenger pick-up and drop-off areas along Iris Street;
- Provision of local bus interchange with LRT at on-street stops at the east and west ends of the bridge; and,
- Re-alignment and relocation of Pinecrest Creek to create a longer length of open and naturalized creek channel that will flow along the east side of the LRT corridor before passing under the LRT track. The creek is currently entombed in a long pipe under the Iris-Transitway intersection.

#### QUEENSWAY STATION DECOMMISSIONING

Queensway Station is an existing station located where the Southwest Transitway crosses under Highway 417. It is a two level station, with Transitway services on the lower level and the cross-town bus service, such as route 101, on the upper level. The lower level platforms will be decommissioned as part of the LRT project due to limits in track curve design and geometry, challenges to providing a long straight segment for the LRT platforms, as well as the proximity to Iris Station (approximately 380 metres away). Retaining the upper level bus platforms, existing elevators and stairs from the creek side pathways up to the Queensway bus platforms would permit pedestrians using the pathway along the LRT corridor to cross the LRT corridor at this location. They could also continue to provide access to transit service for large-scale sporting or special events. Although Queensway Station would be closed, the new Iris and Queensview stations will continue to provide convenient LRT access to local communities.

#### LINCOLN FIELDS STATION

The existing Transitway station at Lincoln Fields is adjacent to the nearby public roads and is served by pathways and pedestrian bridges. The station consists of BRT platforms adjacent and parallel to the Sir John A. Macdonald Parkway and local bus platforms running east-west adjacent to the north side of Carling Avenue.



The future LRT station will be constructed south of the existing BRT station underneath the existing Carling Avenue Bridge over the Parkway. This compact station design shows a centre platform configuration to provide pedestrian access from street level on Carling Avenue down to the LRT platforms below.

Lincoln Fields Station will act as a significant transfer hub to accommodate direct transfer from on-street buses to LRT below (Carling Avenue is designated as a Transit Priority Corridor in the 2013 Transportation Master Plan Affordable Network).

Other stations features include:

- Improved connections to adjacent neighbourhoods and pathways in the Pinecrest Creek Corridor;
- Decommissioning of significant portions of existing Transitway infrastructure;
- Maintaining of existing passenger pick-up and drop-off area to the northeast of the station; and,
- Maintaining an OC Transpo Sales and Information Centres.



Figure 5: Plan view of Lincoln Fields Station

As mentioned previously, a LRT junction will be located immediately south of Lincoln Fields Station and is the point at which Confederation Line will join/split with tracks running south to Baseline Station and west to Bayshore Station.

### *NEW ORCHARD STATION*

New Orchard Station will be a new LRT station serving the communities of Woodroffe North and Woodpark. While the LRT will be in a tunnel under the Byron Linear Park, the station will be below grade and open to the air in the Byron Linear Park between New Orchard and Harcourt Avenues. A compact, one-storey station house will provide pedestrian access to grade level from sidewalks and pathways on Richmond Road, Byron Avenue and within the linear park. The station design will minimize the area it occupies in the linear park and facilitate pathway connectivity.

Other station features include:

- Provision of better cycling and pedestrian access to the station through the reconstruction of Richmond Road to provide a “complete street” with dedicated cycling facilities and improved pedestrian amenities;
- Adjacent pathways, trees and landscape amenities when Byron Linear Park is restored after construction;
- Improved crosswalks at Richmond and New Orchard; and,
- Limited and well defined passenger pick-up and drop-off opportunities along Richmond Road and/or Byron Avenue.



Figure 6: Plan view of New Orchard Station

The alignment runs under Richmond Road and transitions to the Sir John a Macdonald Parkway via privately held lands.

#### 100-DAY WORKING GROUP

On November 27, 2014, Mayor Watson and then Minister responsible for the National Capital Commission (NCC), John Baird, met and directed that a mutually acceptable solution for the future Confederation Line west extension LRT alignment between Dominion and Cleary stations be identified within 100 days. A Working Group composed of NCC Board Members, City Councillors and executive staff from both organizations was struck to identify and evaluate alignment options.

This evaluation process included the identification of key principles, and the evaluation of two new alignment options between Cleary and Dominion stations from the following perspectives: transit operations, cost and constructability, operations and maintenance, community impacts and benefits, ridership and station functionality, as well environment and greenspace.

On March 6, 2015, the 100-Day Working Group announced an agreement in principle for a solution that is outlined in a Memorandum of Understanding. The 100-Day Solution recommends running a portion of the Confederation Line West extension under rebuilt and realigned lanes of the Sir John A. Macdonald Parkway between Dominion and



Cleary stations. The resulting solution and Memorandum of Understanding was posted, for public information, to the NCC and City webpages and is attached as Document 4 to this report.

This solution meets the NCC's criteria, while protecting the Byron Linear Park and Rochester Field, and respecting the City of Ottawa's affordability envelope (for map of alignment see Document 4). The solution also:

- Maximizes greenspace by re-instating existing parkway lanes of traffic closer together, with the LRT stacked beneath;
- Advances the creation of a waterfront linear park of national significance;
- Protects the treed and landscaped buffer between the Parkway and adjacent urban area;
- Enhances and creates new pathways and two new pathway crossings under Sir John A. Macdonald Parkway;
- Reduces annual bus trips on the Sir John A. Macdonald Parkway by over 450,000; and,
- Increases useable shoreline park space by 38 per cent (equivalent to almost 40 football fields).

On March 30, 2015 City of Ottawa followed up the announcement of the 100-Day Solution with a Public Open House, at City Hall. At the Open House, the public had the opportunity to review and provide feedback on the preferred solution between Dominion and Cleary Stations.

April 22, 2015, the NCC Board approved the Memorandum of Understanding approving the jointly developed solution for the portion of the alignment between Dominion and Cleary Stations.

Further details on both Cleary and Dominion stations are included in the descriptions below.

### CLEARY STATION

Cleary Station is a new station, located to serve the McKellar Park community. It sits within the Sir John A. Macdonald Parkway Corridor adjacent to the east side of Cleary Avenue where the City right-of-way ends at the private entrance to the Unitarian Church grounds. With the exception of a station house to provide accessible at-grade access from Cleary as well as the Parkway pathways, the station will be fully buried with a “green roof” to blend into the surrounding landscape and topography. The functional design results from the 100-day solution and responds to NCC and local community concerns. It has such features as:

- Final station location, size and design that will fit into the open space and community context;
- Access to the waterfront from the station and the community by maintaining existing pathways and providing a new multi-use pathway crossing under the Parkway;
- Direct pedestrian access to the station from Richmond Road via a broad walkway integrated into the streetscape; and,
- Provision of limited and well defined passenger pick-up and drop-off opportunities along Richmond Road and Byron, and discouraging these activities on Cleary.



Figure 7: Plan View of Cleary Station

*DOMINION STATION*

Dominion Station is an existing Transitway station located northwest of Dominion Avenue with basic open-air platforms and shelters adjacent to where the Transitway trench rises to meet the Sir John A Macdonald Parkway. Currently, pathways provide access from Dominion and Berkley Avenues to the south and Workman Avenue to the north.

The LRT station will be located in the existing Transitway trench to take advantage of the higher land with open air LRT platforms below grade in the existing Transitway trench on City property. A compact, one-storey station house will provide fully accessible, direct access from Berkley Avenue at street level on the south side of station. From the north side, passengers will be able to access the station via Parkway level pathways and ramped pathways down from Workman Avenue. Neighbourhood sensitivity, as well as the protection of green space and river views will inform the final station house location, size and design.

Other stations features include:

- Improved unimpeded access to the waterfront from the station and the community by maintaining existing pathways and providing a new multi-use pathway crossing under the Sir John A MacDonald Parkway;
- A new multi-use pathway bridge over the LRT connecting pathways and communities on the south side to the pathway on the north side;
- Reduced impact on the existing landscape by shifting the alignment to the north;
- Improvements to reorganize and contain the existing informal passenger pick-up and drop-off to better serve and fit into the community, and;
- Improved pathway and sidewalk neighbourhood connections.

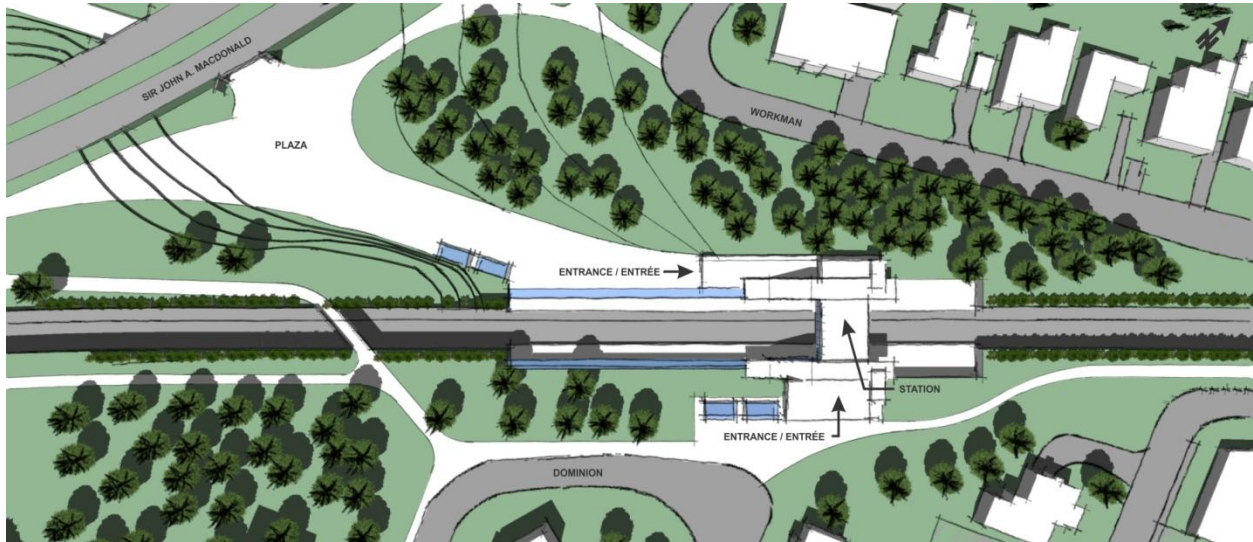


Figure 8: Plan view of Dominion Station

### WESTBORO STATION

Westboro Station is located on the north side of Scott Street, between Athlone and Tweedsmuir Avenues. It is an existing Transitway Station, which will be rebuilt within the existing Transitway trench with open air LRT platforms on the lower level and local bus platforms at street level. The existing bus loop will also be maintained to facilitate local transfers.

To improve accessibility and implement a fare control zone, the existing overhead bridge structure will be decommissioned and a new, wider structure will be constructed with a new station entrance along the west side of the existing upper level bus loop.

As part of the station conversion, the southern portion of the bus loop which currently separates the station from Scott Street will be eliminated to create a large plaza and an on-road bus lay-by. This will maintain the east-west multi-use pathway connectivity through the station area similar to what occurs at Tunney's Pasture Station.

Other stations features include:

- Signalized crossings at both Athlone and Tweedsmuir to maintain pedestrian access from Scott Street and the adjacent community;
- Improved east-west pedestrian and cycling linkages on Scott Street and to the

multi-use pathway along the linear park; and,

- Improved passenger pick-up and drop-off area along Scott Street.

Westboro Station currently has local transit connections to OC Transpo routes, which can be maintained as Richmond Road, Churchill Avenue and Scott Street will continue to provide local access to the station.



Figure 9: Plan view of Westboro Station

### *Confederation Line East Extension*

The Confederation Line East Extension project will include 10 kilometres of rail and four new stations. The extension is being proposed in the median of the highway to contain costs, minimize community impacts and land requirements, and provide good connectivity to surrounding communities by offering stations that are equidistant to neighbourhoods on either side of the highway. This particular extension will improve transit service to major mixed-use centres and numerous residential communities, as well as to other destinations including the Bob MacQuarrie Recreation Complex and Place d'Orléans Shopping Centre.

As mentioned previously, the design of the Confederation Line East LRT Extension and the design of the widening of the western section of Highway 174 (between Blair and Trim) are interdependent, the functional design work has proceeded on both elements

to achieve better design outcomes, ensure efficiencies of scale, and maximize benefits both to the community and to the environment.

The LRT can be constructed independently of the ultimate highway widening, except for some minor highway detour works near the stations required to facilitate construction. To facilitate Council's approval of the functional designs, the plans for both projects are being presented together to illustrate their mutually supporting nature.

The Confederation Line East LRT Extension EA will be submitted to the Province subsequent to Committee and Council receiving this information and directing staff to proceed with the TPAP process.

Later this year, the design of the eastern portion of the Highway widening from Trim, to the City's eastern study limit at Canaan Road, will be presented to Committee and Council and bundled with the western segment presented in this report and will be submitted to the Province subsequent to Committee and Council receiving this information and directing staff to proceed with the Schedule 'C' environmental assessment.

Overall, the alignment will be north of Highway 174 between Blair Station and Montreal Road; it will extend directly east and bypass the existing Transitway alignment, passing under Blair Road and the interchange ramps. To accommodate the LRT alignment, new bridge structures are required to carry Blair Road and the Highway 174 on and off ramps over the LRT. The rail line will cross over the westbound highway lanes immediately east of Montreal Road and transition into the median of the highway at this location. East of the NCC Greenbelt, the LRT remains at grade in the median.

The Confederation Line East Extension will have four new stations: Montreal Road Station, situated on the north side of Highway 174; as well as Jeanne d'Arc station, Orléans Boulevard, and Place d'Orléans, which will all be located within the median.

### **BLAIR STATION**

Blair Station is the eastern terminus of the Confederation Line and will be the tie-in point with the Confederation Line East Extension Project. From Blair Station, the line will continue along the north side of Highway 174 to Montreal Road Station. A future continuous pathway from Blair Station to Montreal Road Station is also proposed as



part of the project and could be placed alongside the LRT alignment or through the local neighbourhood. The LRT alignment (shown in pink) will extend directly east and bypass the existing Transitway alignment, passing under Blair Road and the interchange ramps. To accommodate the LRT alignment, new bridge structures are required to carry Blair Road and the Highway 174 on and off ramps over the LRT.

The area (shown in red dashed line) is being protected for the future Cumberland Transitway, as identified in the August 2011 Hospital Link and Cumberland Transitway Westerly Environmental Project Report, as well as the 2013 TMP. Although the Cumberland Transitway is shown as being outside of the affordable funding envelop of the 2013 TMP, the project still holds importance and its corridor remains protected in the 2013 Official Plan. The Cumberland Transitway was identified as a necessary part of the transportation network solution when the East Urban Community was expanded south of Innes Road.

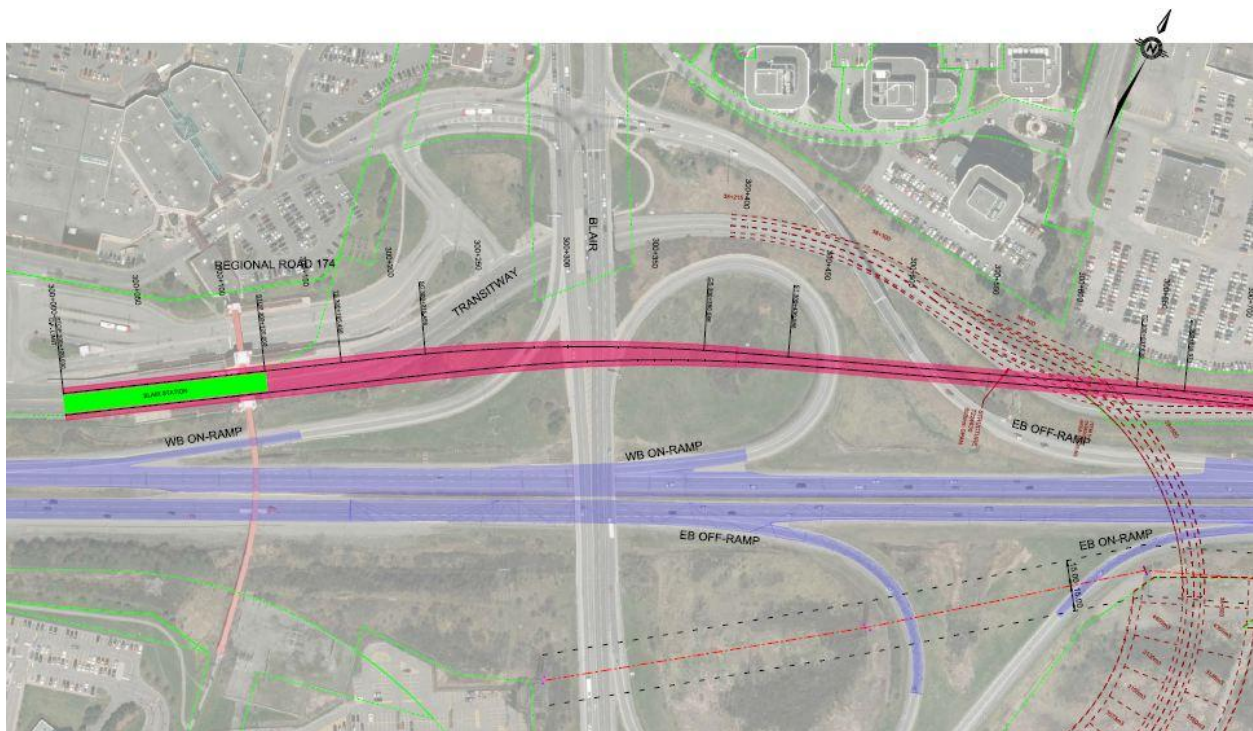


Figure 10: Blair Station

Proceeding east for 800 metres, protection for a possible future station (post-2031) is proposed in the vicinity of Gloucester High School, in response to public comments

expressing desire for a station between Blair and Montreal. The station would have to be implemented in cooperation with the adjacent land owner(s), as access to the station would need to be provided via adjacent properties. Future transit-oriented development (TOD) potential in the area, good station spacing, and convenient access to Gloucester High School, the adjacent community centre and recreational facility would support eventual construction of this station.

### MONTREAL ROAD STATION

Montreal Road Station will be situated on the north side of Highway 174 and will serve the nearby Beacon Hill community and Canotek Business Park. Ramps at the Montreal Road interchange will be modified to allow easy pedestrian and cyclist access.

The station will be situated in the northwest quadrant of the interchange, with stairs and elevators concentrated at the end of the platforms connecting to a lower level concourse to provide easy access to the west side of Montreal Road.

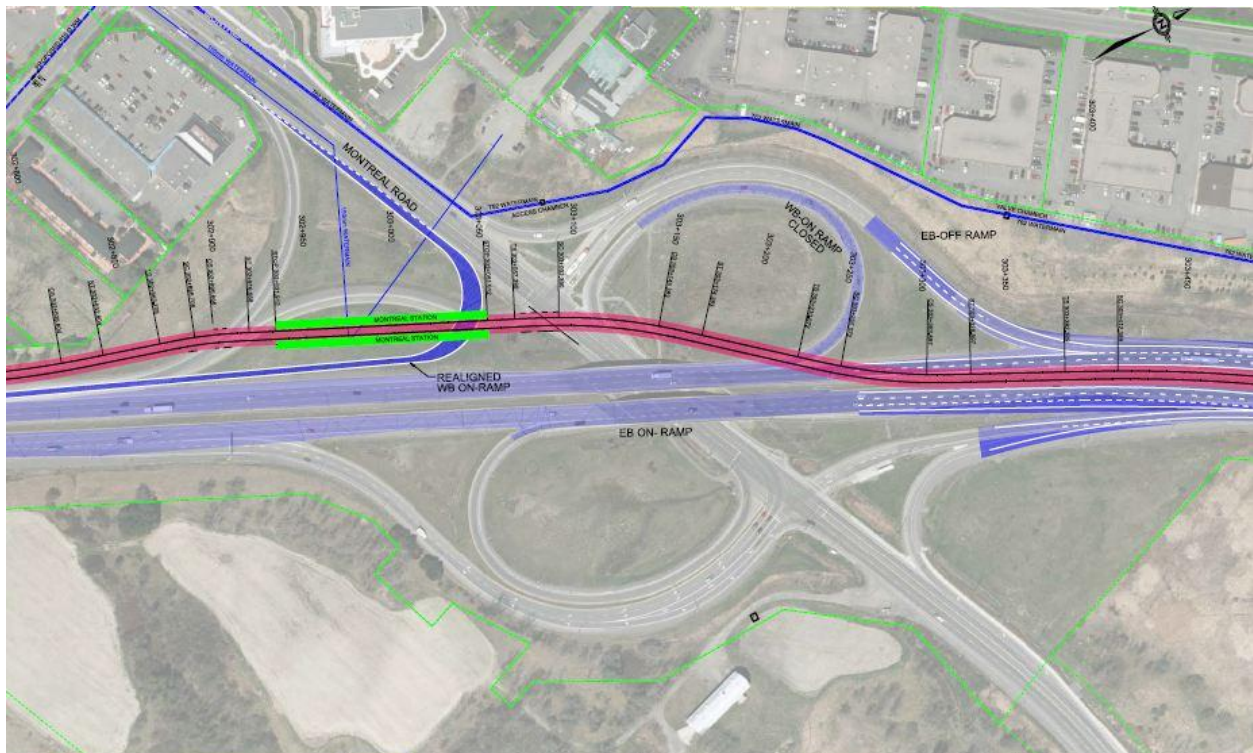


Figure 11: Montreal Road Station



**JEANNE D'ARC STATION**

Jeanne d'Arc Station will be the first Confederation Line stop east of the NCC Greenbelt. The station spans under the existing bridge structure with a design resembling Cyrville Station on the Confederation Line. There will be a station house on either side of the roadway to allow direct access to the station for passengers transferring to and from buses or the pedestrian plaza. The interchange will be modified to remove the free-flow ramp for northbound to westbound traffic to improve bus, pedestrian and cycling accessibility.

This station ultimately requires widening of Jeanne d'Arc Boulevard and the bridge structure to accommodate bus lanes, cycling facilities, and wider sidewalks for station access. Bus connections may be limited to through routes, as there is no space to accommodate a bus layup or turnaround on the bridge but there may be nearby opportunities to accommodate these uses. Potential pathway connections to adjacent communities would require property acquisition for pathway corridors between existing homes to shorten the walking distance. In the short term, the existing four-lane bridge will provide adequate space for station access, although one lane in each direction will be converted to a transit priority lane to accommodate space for local bus connections. Existing travel demand is adequately provided by the one general purpose lane in each direction, with future widening opportunities identified post 2031.

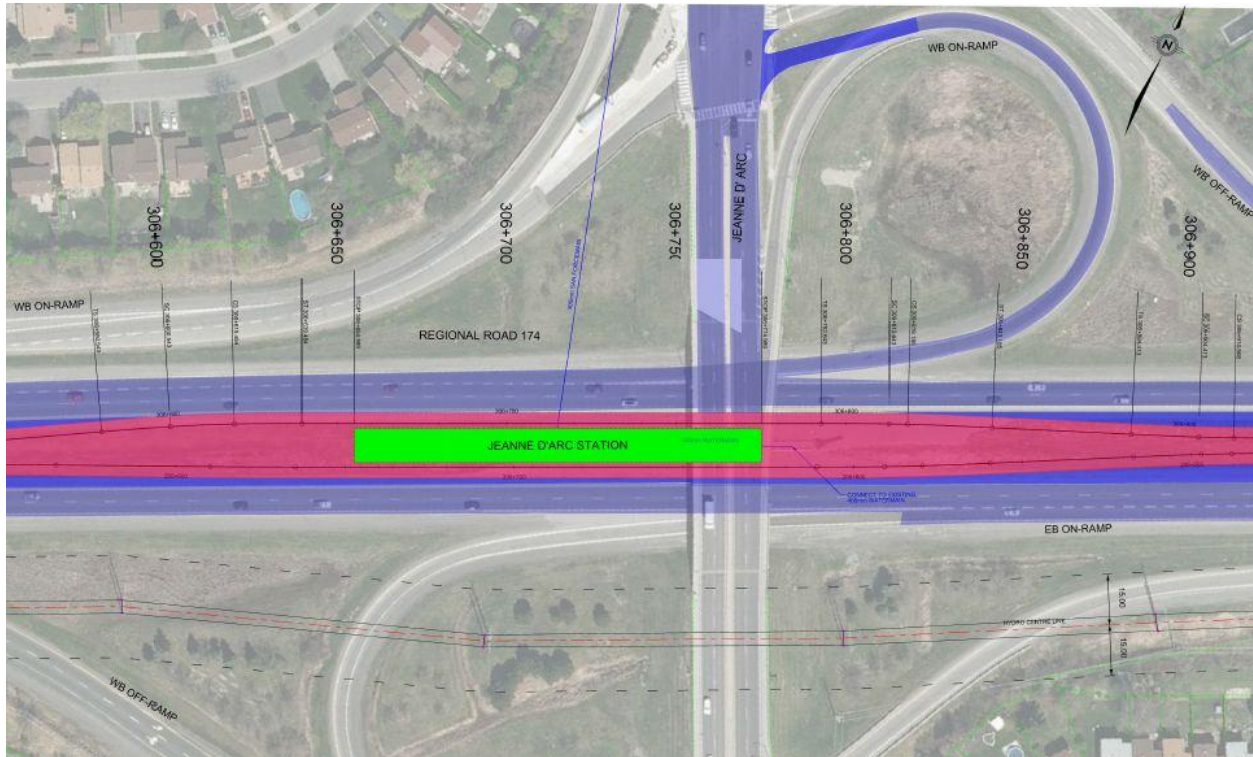


Figure 12: Jeanne d'Arc Station

### ORLÉANS BOULEVARD STATION

Orléans Boulevard Station will be a smaller volume station similar to Jeanne d'Arc Boulevard Station. It will be centered under the existing bridge structure, with station access from both sides of the bridge. With no Highway 174 access to/from Orléans Boulevard, this station will be closer, more compact, and more accessible to the adjacent communities.

Orléans Boulevard is currently four general purpose lanes. Converting one lane in each direction for buses, in the vicinity of the station, will provide space for local bus connections at curbside in front of the station. Existing pathways in the southeast and southwest provide good connectivity to the proposed location of Orléans Boulevard Station. Pathway opportunities in the northeast and northwest would require property acquisition to establish corridors into the community and are noted as future opportunities.

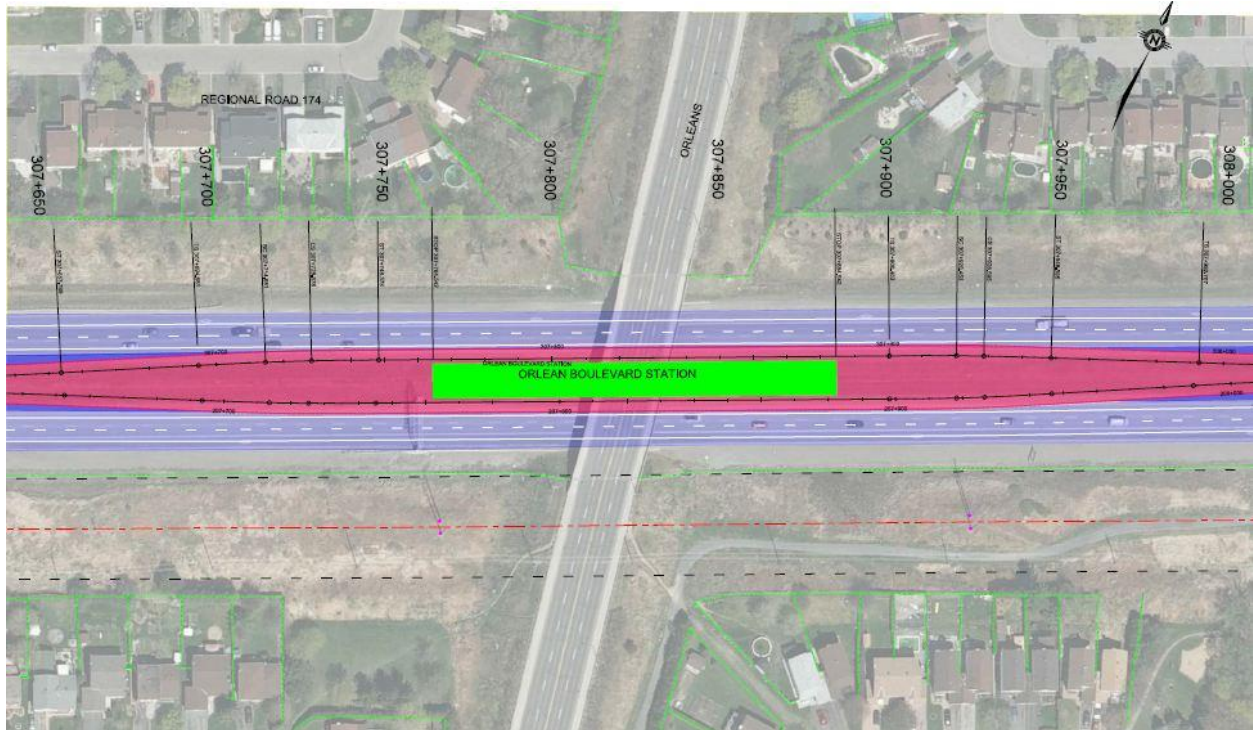


Figure 13: Orléans Boulevard Station

### PLACE D'ORLÉANS STATION

Place d'Orléans Station will serve as the terminus for the Confederation Line East Extension to Orléans. It will connect to the existing Transitway station north of Place d'Orléans shopping centre (immediately south of Highway 174), and to the Park & Ride lot (to the north) via an existing pedestrian bridge.

The new station will be deliberately placed west of Champlain Street, as this bridge structure can accommodate the construction of LRT tracks in the short term. A new structure will eventually be required to accommodate future highway widening. The station will also align more directly with the bus platforms and the centre of the Park & Ride lot. A future connection from the east end of the platform directly to Champlain Street is recommended as the area becomes more urbanized. The station will include public washroom facilities, and there is some limited capacity to expand the Park & Ride lot but any significant increase would require a parking structure.



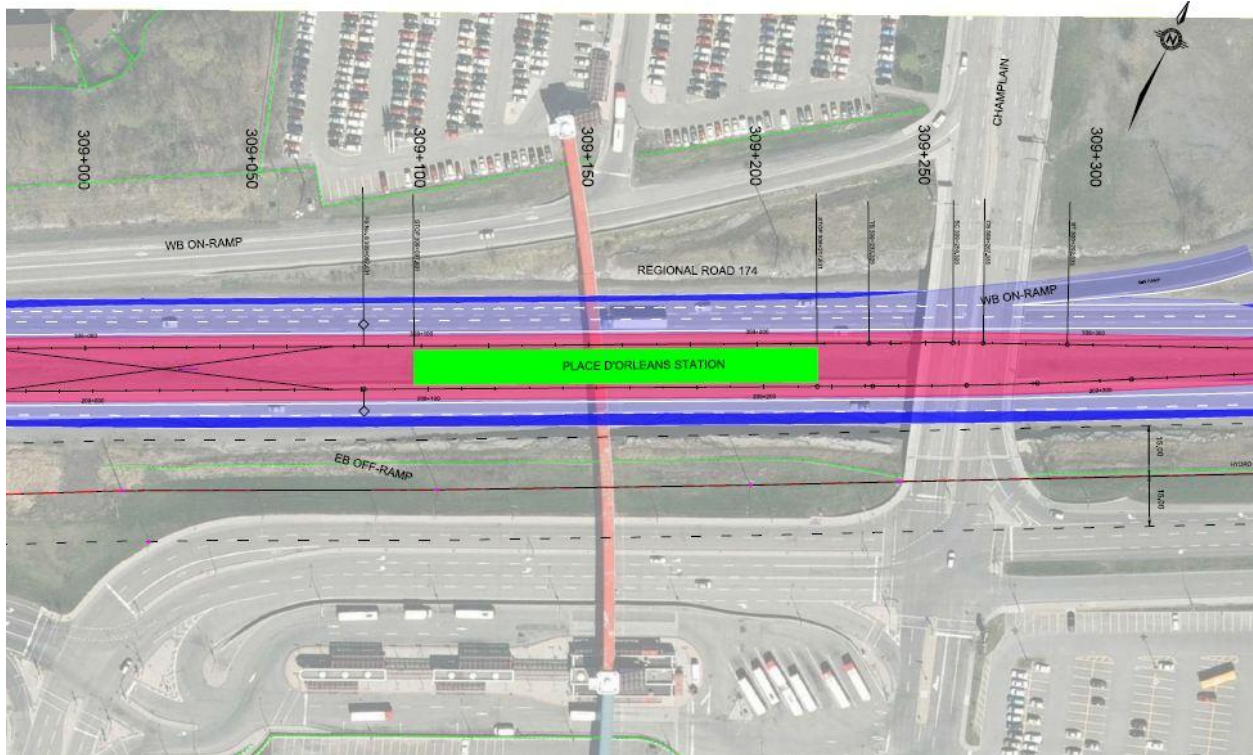


Figure 14: Place d'Orléans Station

### *Trillium Line*

The Trillium Line extension includes five new stations and eight additional kilometres of single track from Greenboro to Bowesville in Riverside South, with passing tracks at South Keys and north of Leitrim, and grade separations at Lester and Leitrim to provide grade separation from the road crossings in these areas. The proposed plan would extend the City's LRT reach to Leitrim and Bowesville in Riverside South, bringing southern communities such as Manotick, Findlay Creek, Greely and Osgoode much closer to this high quality transit service. The overall alignment for the most part follows the existing City-owned (Former CPR) railway corridor, which was the same envisioned for the North-South Light Rail Transit Project to Bowesville (ACS2006-PGM-ECO-0014).

Three of the five new stations will be located along the extended line, south of the existing Greenboro Station. These stations include: South Keys, with connections to the existing Southeast Transitway station; Leitrim Road, adjacent to the existing Leitrim

Park & Ride lot, and; Riverside South approximately 150 metres east of Bowesville Road.

In addition, the Trillium Line extension includes two new stations along the existing line: one at Gladstone Avenue, and a second on the south side of Walkley Road, adjacent to the existing hotel/condominium development.

All of the stations will include pedestrian connections to nearby roadways and/or Multi-use Pathways (MUPs).

The extension of the Trillium Line, new stations and structures for grade separation will allow for future conversion to twin-track electric LRT and will be built to accommodate the implementation of the Airport Rail Link as well as the planned widening of both the Airport Parkway and Lester Road.

### GLADSTONE STATION

A new grade-separated station will be constructed on the north side of Gladstone Avenue, on the existing Trillium Line between Bayview and Carling Stations. Options to provide access from a future pedestrian plaza proposed in the Gladstone Community Design Plan, as well as from the existing multi-use pathway on the east side of the tracks and a proposed multi-use pathway on the west side will be developed.

This station will consist of two side platforms below grade, accessed from street level via station houses containing redundant elevators and staircases. Fare Gates will delineate a fare-paid zone within the station.

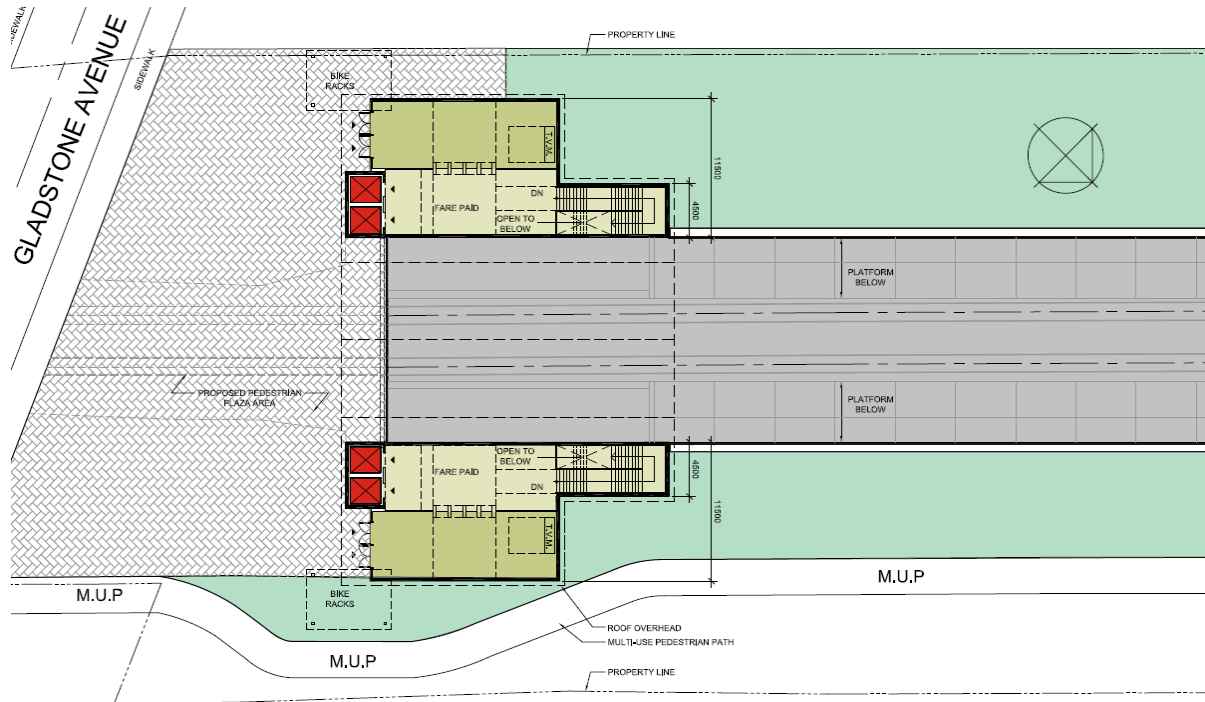


Figure15: Gladstone Station Base Design

### WALKLEY STATION

A new grade-separated station is planned for the south side of Walkley Road, adjacent to the existing hotel/condominium development. This station will fall between the existing Confederation and Greenboro stations. The configuration will be similar to Gladstone and Confederation stations, with only one station house and platform built. The station will have elevators and a staircase providing access to Walkley Road, local bus routes and the existing Transitway station houses. There are opportunities for pathway connections to the adjacent development and other nearby land uses to the south to be explored during future phases of design. This station will also include a fare-paid zone and a weather-protected platform.

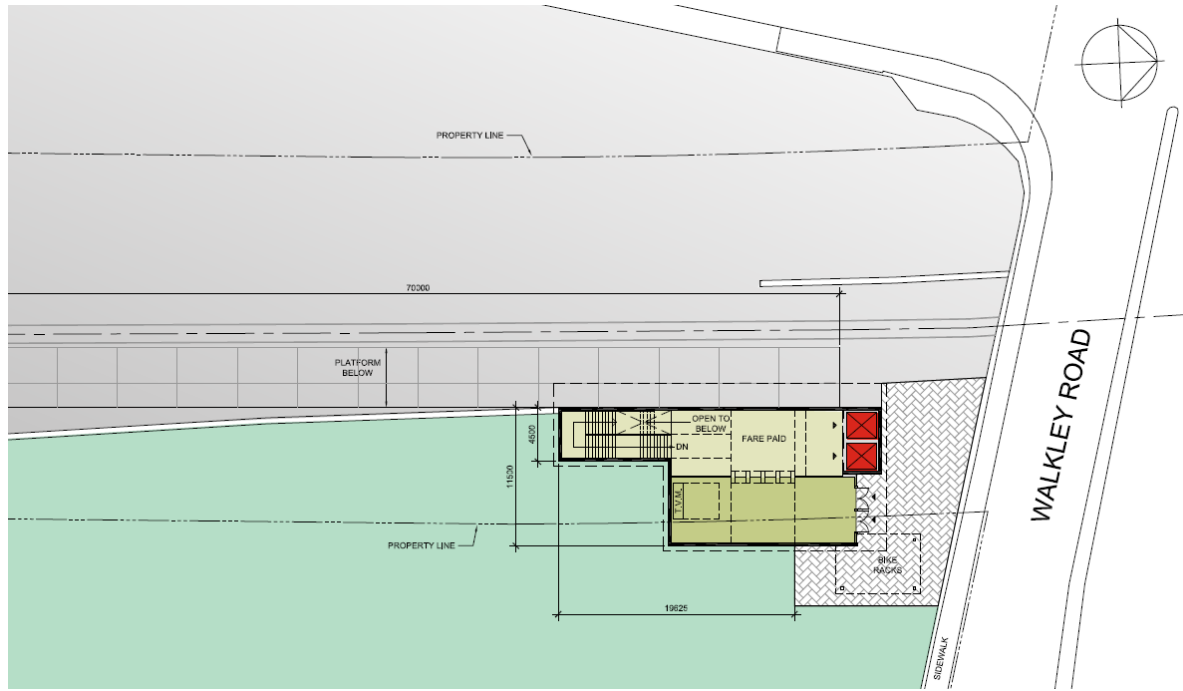


Figure 16: Walkley Station

SOUTH KEYS STATION

A new station will be built at South Keys, adjacent to the existing Transitway station. This station will be located within a passing siding and may incorporate a centre platform and pocket track to serve as the future transfer station to/from the Airport Rail Link. It will be accessible via redundant elevators and a staircase from the existing pedestrian underpass, and will provide a connection, via the underpass, to the adjacent existing Transitway Station.

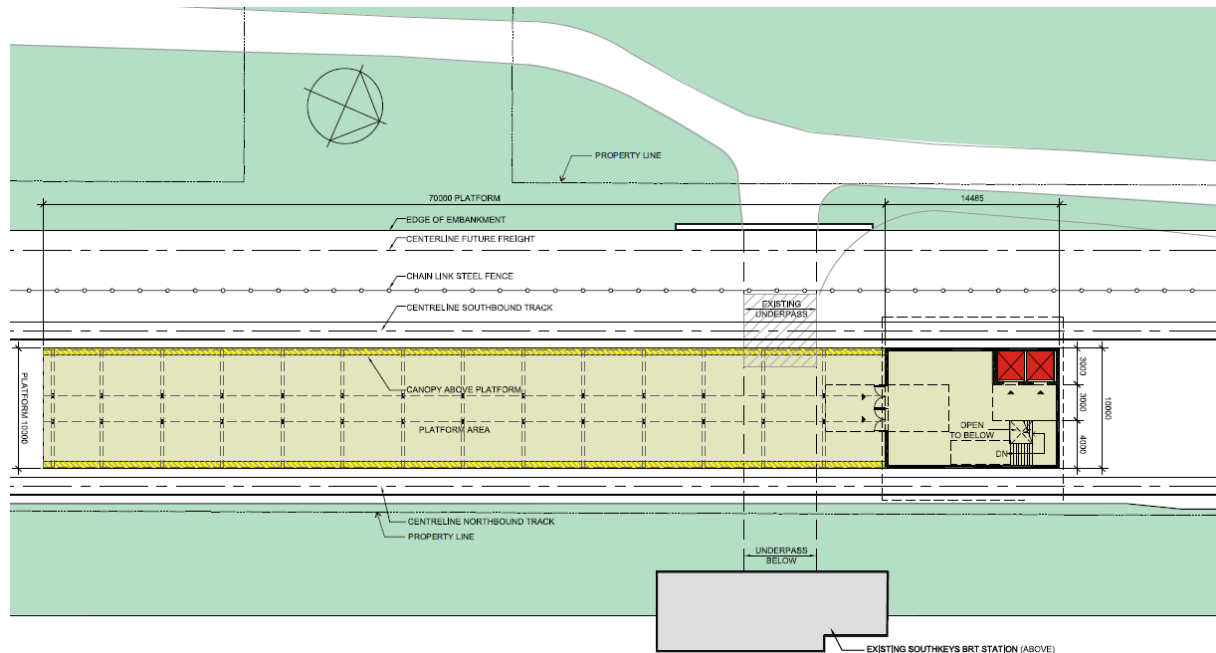


Figure 17: South Keys Platform design

### LEITRIM STATION

A new at-grade station is to be constructed south of Leitrim Road, adjacent to the existing Leitrim Park & Ride lot. The design of this station reflects its rural context and will include a small station house and a covered walkway across the bus lanes to the rail platform. The fare-paid zone at this station will include both bus and rail platforms, which will be oriented north-south. A loop at the northwest corner of the Park & Ride will provide turnaround and lay-by space. The Park & Ride lot will be expanded to 460 spaces for opening day with 925 spaces planned for the ultimate configuration.

A passing siding running from just south of the NRC testing facility to just North of Leitrim Road is projected to be required however, the final location and length of this passing siding will be optimized through the design advancement and procurement.



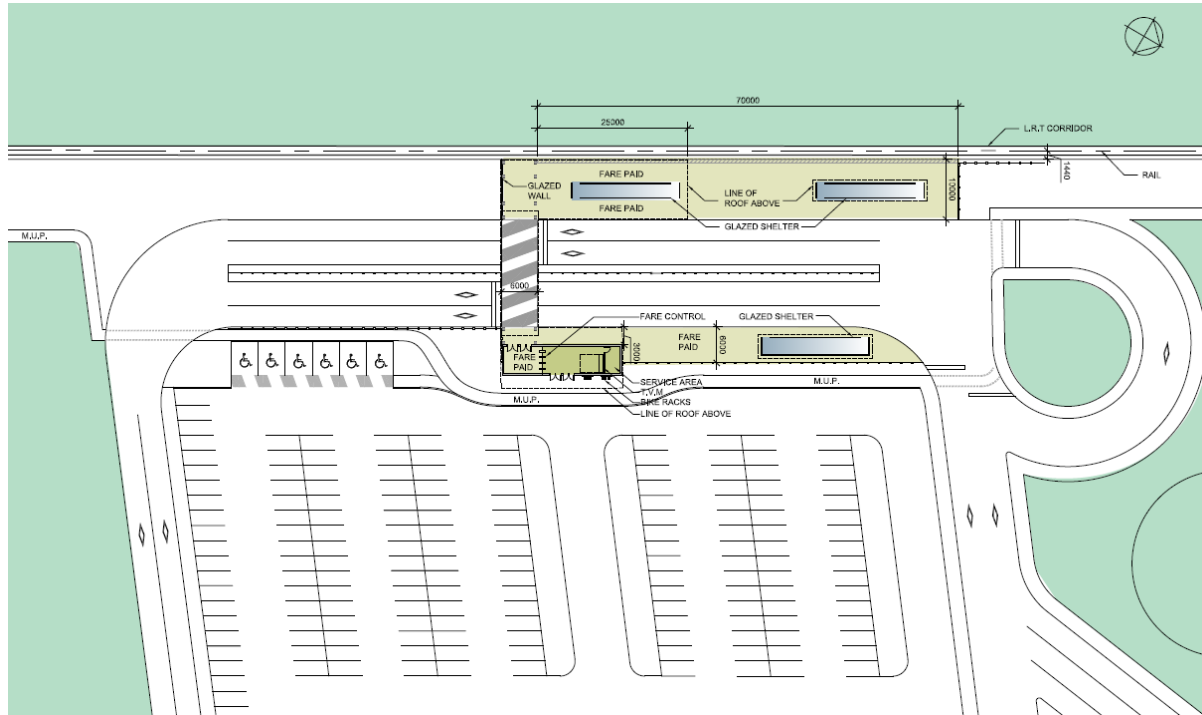


Figure 18: Leirim Park and Ride Station Design

RIVERSIDE SOUTH (BOWESVILLE)

A new at-grade station and Park & Ride lot are to be constructed approximately 150 metres east of Bowesville Road, on land that must be acquired from the Ottawa Macdonald-Cartier International Airport Authority (OMCIAA). Like Leirim Station, the design of this station reflects a rural context and includes a covered walkway across the bus lanes to the rail platform, and glazed shelters on all platforms. The fare-paid zone at this station also includes both bus and rail platforms. A loop and bus layup area will be located at the east end of the station.

The Park & Ride lot will accommodate 400 spaces on opening day with the potential to accommodate 3,100 spaces.

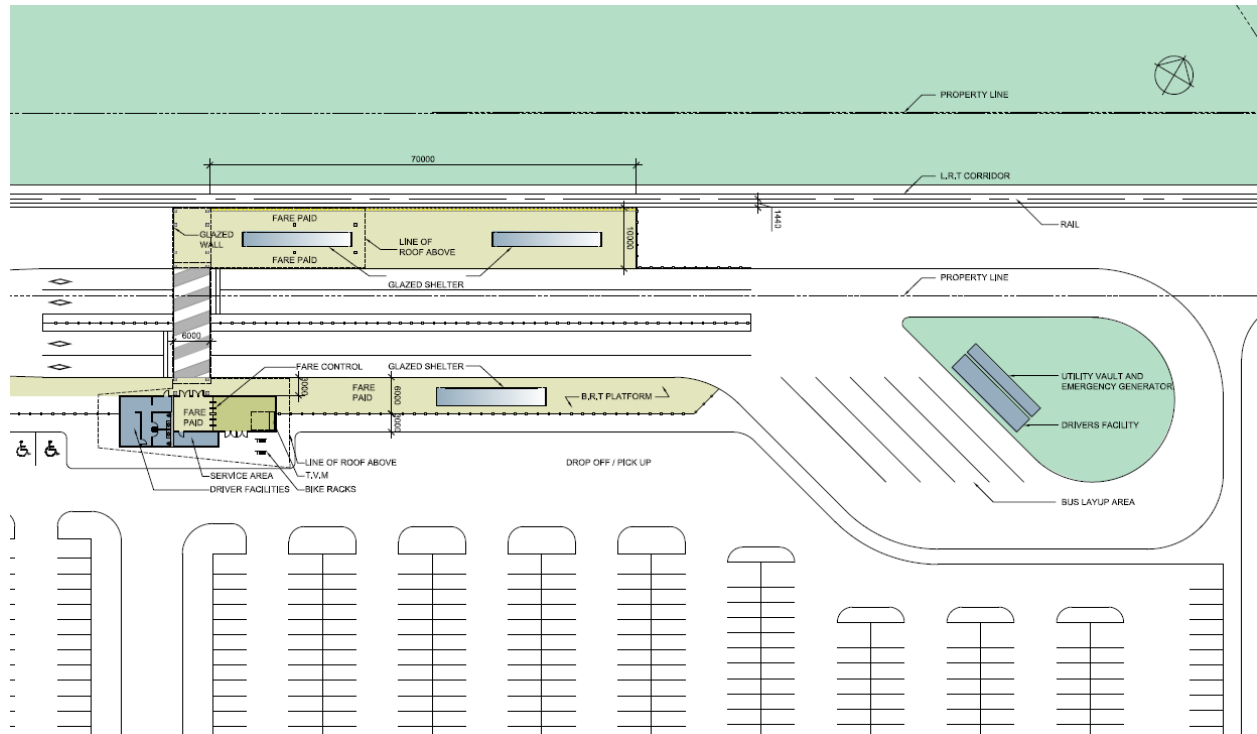


Figure 19: Bovesville Station Park and Ride Design

### CONFEDERATION STATION RELOCATION

As the federal government has future plans to redevelop this federal facility node, the EA study determined options for the potential relocation of Confederation Station to the north side of Heron Road. In this scenario, the station configuration would be similar to Gladstone Station, although only one station house and platform would likely be built in advance of conversion to electric LRT. The station would house elevators and a staircase to provide direct access to Heron Road transit service, and would also be accessible via at-grade pathway connections at the north end, providing pedestrian access to the existing underpass under Heron Road. The station would also include a fare-paid zone and a weather-protected platform. Timing for this potential relocation remains to be determined by the federal government, and it is expected that any costs associated with implementation would not be borne by the City.

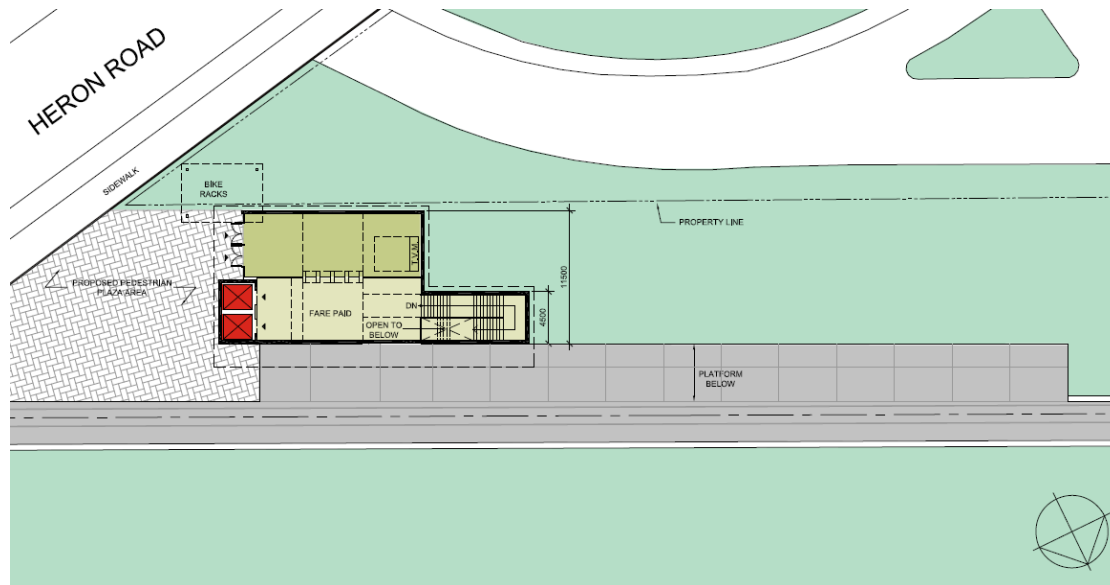


Figure 20: Confederation Station

*Beyond Stage 2*

AIRPORT LINK

UPLANDS STATION

Uplands Station will be located along a passing siding, and will be designed as a grade-separated station with two side platforms to reduce property impacts. A station house, designed to accommodate Ernst & Young (EY) Centre event traffic, will incorporate street-level doors on the south side providing access to a bus transfer platform within the fare-paid zone, with staircases and switchback ramps (or redundant elevators, if required) providing access to each rail platform. A street-level connection will be provided from the south entrance of the station to the EY Centre, and a MUP connection will be provided to Uplands Drive.

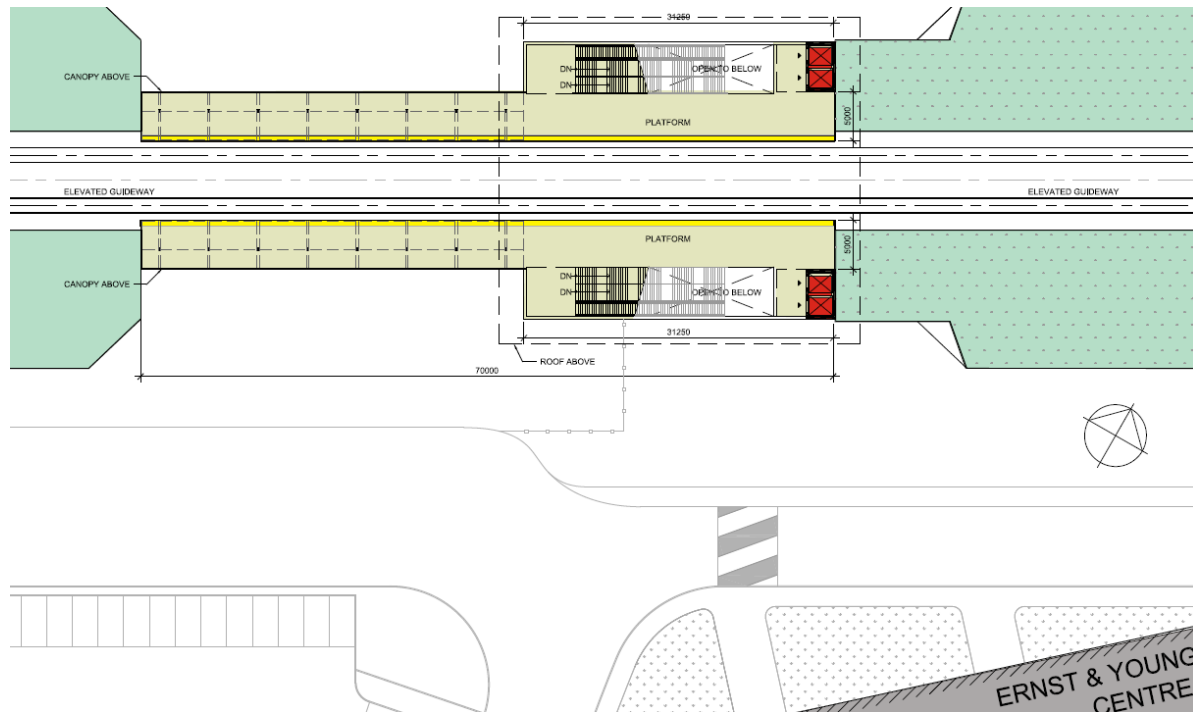


Figure 21: Uplands Station

### AIRPORT TERMINAL STATION

Airport Terminal Station will be located between the Ottawa Airport terminal and parking garage structures, at the top level of the parking garage. It will consist of a single platform, with a short length of track provided beyond the platform. The station will be connected to existing ramps, elevators and pedestrian walkways to provide weather-protected access to the terminal building. Public washroom facilities for this station will be those within the terminal building.

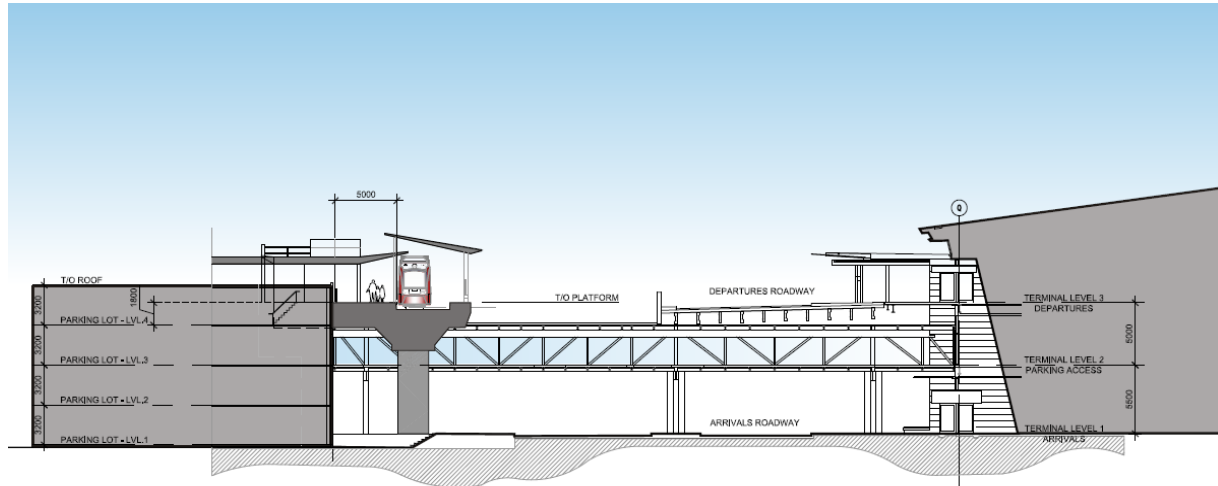


Figure 22: Terminal Station

### TRIM ROAD EXTENSION

### ORLÉANS TOWN CENTRE STATION

This mid-block station sits east of Champlain Street and west of Tenth Line Road. It will serve the Orléans Town Centre, with amenities such as the Shenkman Arts Centre, Peter D. Clark Place, a hotel, restaurants, retail shopping, medical and personal services, as well as existing higher density residential development. A new pedestrian overpass will link the communities from north and south of Highway 174. The station is positioned to allow access from existing pedestrian pathways on the north side that will be upgraded to multi-use pathway standards.

Transit-oriented development, including mixed-use and higher density residential development, is currently under construction directly south of Highway 174 and will be served by Orléans Town Centre Station. As part of the development, a road network has been designed to connect to the LRT station to support passenger drop-off and pickup.

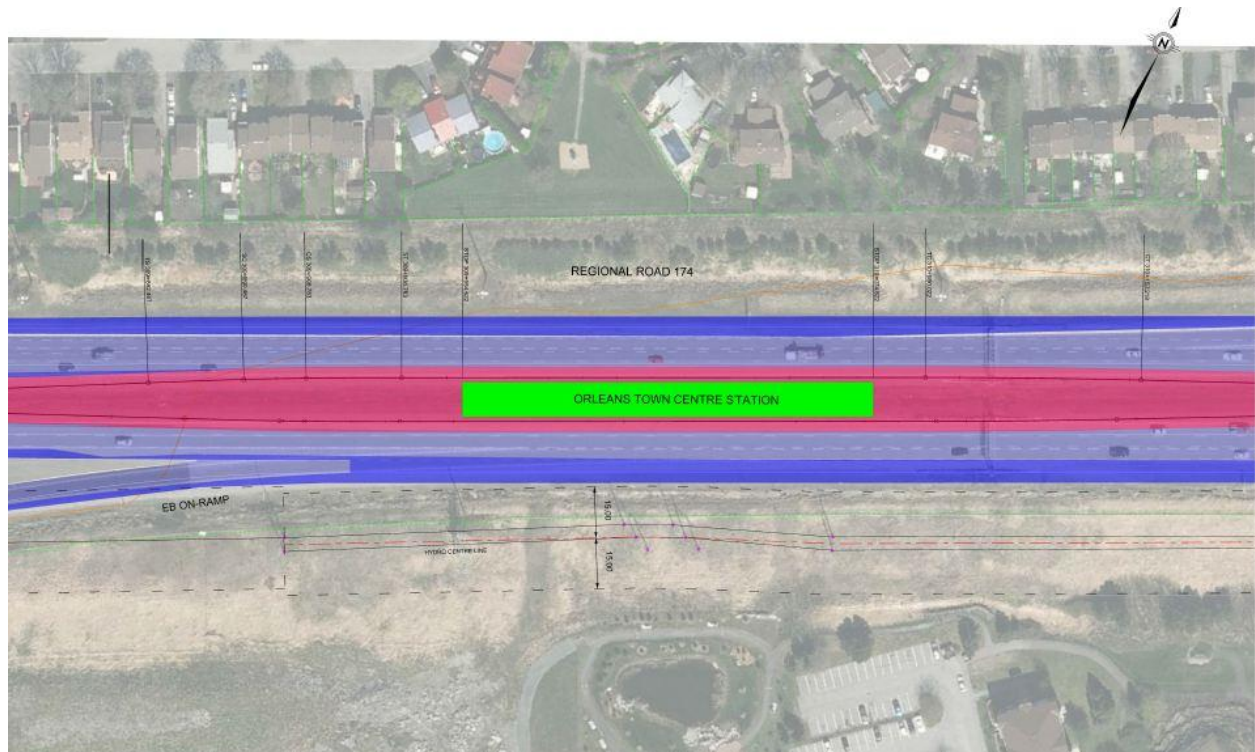


Figure 23: Orléans Town Centre Station

### TENTH LINE STATION

Although the City's TMP identified a station directly at Tenth Line Road, the Tenth Line Road interchange design with wide ramps poses challenges for station connectivity. For this reason an alternative station location 300 metres east of Tenth Line was considered and is recommended as a mid-block station with a pedestrian overpass.

While the land use is currently vacant, concept development plans are underway on both sides of Highway 174 consisting of high density commercial on the south side and higher density residential on the north. There are opportunities to incorporate bus passenger drop off and pick up during the development phase.



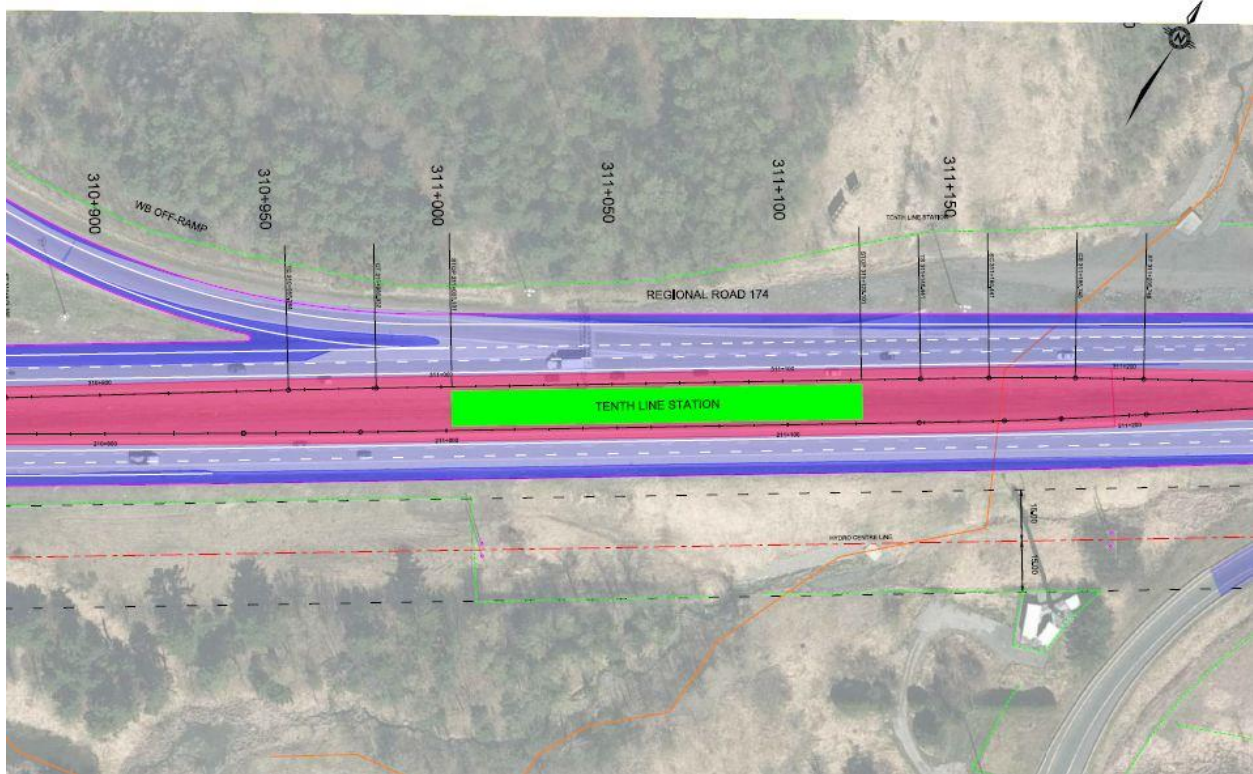


Figure 24: Tenth Line Station

*TAYLOR CREEK BUSINESS PARK STATION (DELETED)*

Work undertaken as part of this planning study concluded a station serving the Taylor Creek Business Park, identified in the 2013 TMP, would generate very low ridership and is located in proximity to Trim Station. This station is therefore recommended to be removed from the project.

*TRIM STATION*

As the LRT approaches the planned terminus at Trim Road, there are double crossovers located immediately in front of the station to manage train operations. Today, Trim Road and Highway 174 is an at-grade signalized intersection. A grade separation would be required to integrate with the new station. Ramps will be provided for all movements, but will be positioned to allow for good access to the LRT station and permit some TOD nearby. This will allow the station to be placed under the Trim Road

bridge with a pedestrian connection to the Park & Ride lot. A roundabout at Trim Road and North Service Road is recommended to facilitate local access.

Currently the bus loop is at the south end of the Park & Ride lot and will be relocated closer to the LRT station for greater connectivity. There is TOD potential for the development block on the north side, which is the former MTO works yard.

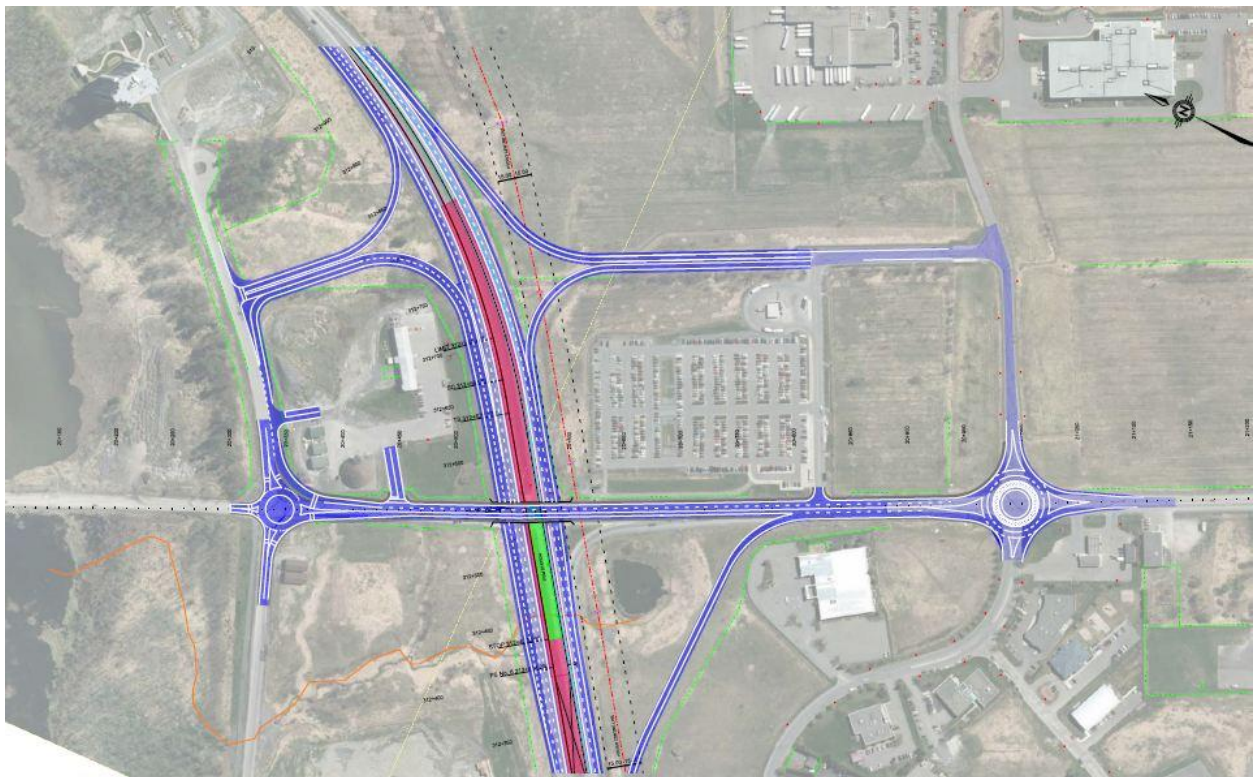


Figure 25: Trim Road Station and Interchange

### **Keeping Ottawa Moving**

Environmental assessment studies provide general information on the kinds of impacts associated with various types of construction, constraints, and techniques. They do not undertake a detailed look at the potential construction means and methods used. Very often, the actual construction impacts are more limited and the construction footprint required is smaller than those noted in the EAs.

As with most P3/AFP construction projects, the proponent selected to build Stage 2 will be responsible for developing final plans and designs that:



- Address noise, vibration and air quality;
- Provide pedestrian, cycling, traffic and transit access;
- Protect the natural environment;
- Minimize disturbance to communities; and,
- Manage waste, and potential for accidents and spills.

Overall, the design and procurement for the Stage 2 LRT Project will be structured similar to the Confederation Line to minimize construction impacts on the City's transit and transportation network, adjacent businesses and communities.

For example, as was the experience with Confederation Line, sensitive receptors will need to be identified along the corridor where thresholds for noise and vibration must be met. In these circumstances, a noise and vibration monitoring plan would be put in place during construction, and pre-construction building surveys would be completed where construction for the LRT alignment runs within close proximity of private property.

The Stage 2 LRT Project will, depending on the procurement model selected, employ similar Net Present Value tools that were used during the Confederation Line procurement process like the Mobility Matters schedule which institutes a financial incentive/disincentive plan to minimize the number and duration of detours, lane closures and impacts to local landowners.

### **Mobility Impacts and Construction Staging**

Some mobility impacts will be experienced during the construction of the Stage 2 LRT Project. The Project Agreement and procurement documents will be structured to minimize these impacts, as outlined above, and any bus service adjustments will be minimized and spread out along potential corridors as much as possible.

To facilitate the construction of the Confederation Line West Extension from Tunney's Pasture to Dominion the Transitway will need to be temporarily closed east of Dominion Station. Options to provide supplemental service during this time include running additional transit service along sections of Carling, Woodroffe, Richmond, Churchill, Scott, Holland, or the Sir John A. MacDonald Parkway.

With respect to the section from Dominion to Lincoln Fields, the Sir John A. MacDonald Parkway could continue to provide reliable Transitway service with some temporary lane adjustments to accommodate construction. In addition, sections of Byron Avenue could be use to route traffic around sections of Richmond Road while under construction.

Between Pinecrest and Bayshore the West Transitway will need to be closed to permit conversion to LRT. Transitway service diversions could include a routing along sections of Highway 417, Pinecrest and Richmond Road, and Carling Avenue.

Between Lincoln Fields and Baseline the Southwest Transitway will need to be closed for the conversion to LRT. For this segment, Transitway diversions could include the sections of Woodroffe, and Greenbank Roads or Carling Avenue.

Other transit diversions could include the use of bus rapid transit (BRT) lanes on Baseline Road, the use of Highway 417 for peak period bus service, or increasing service from Barrhaven via Riverside South to the Trillium Line and Southeast Transitway.

The Confederation Line East Extension can be constructed independently of the ultimate highway widening, except for some minor highway works near the stations required to facilitate construction. Construction of the elevated guideway where it crosses Montreal Road and enters the median alignment of Highway 174 will require some temporary traffic adjustments. Eastward from Montreal Road, temporary highway widening will be required to ensure traffic and transit operations are maintained during the construction of the runningway and stations. In addition, structural work to integrate stations near or with the crossings of Highway 174 at Jeanne d'Arc Boulevard, Orléans Boulevard and at Place d'Orléans will also cause some periodic traffic impacts. No significant traffic or transit diversions are anticipated as it is projected that most of the installation of the barrier between the LRT and the highway can be done with midday, evening and weekend lane restrictions. Once the barriers are in place, much of the work can be done from inside the LRT area. The detour lanes around the three stations can be retained and be incorporated into the ultimate highway widening.

For the Trillium Line, the most significant traffic impacts are associated with the implementation of grade separations at Lester and Leitrim Roads. Work to integrate

connections between the LRT station and the Transitway station at South Keys may cause some temporary alterations to bus boarding and drop off areas. Further, service will likely have to be halted to facilitate the construction of Gladstone and Walkley Stations and/or during the commissioning and testing phases. Recognizing this, it may be possible to limit potential shutdowns to weekends or over consecutive summer seasons when ridership capacity can more easily be served by the 107 replacement bus route. In addition, the implementation of the first phase of the Airport Parkway widening (Brookfield to Hunt Club) by 2019 could help to mitigate some related mobility impacts.

In order to maximize the flexibility and innovation, Project Co. will determine the optimal detour routing and designs governed by the strong incentives and disincentives to keep mobility impacts to a minimum. These incentives may result in some extensions achieving revenue service at different times (prior to 2023) to maximize the transportation network in the City during construction and to realize extension benefits earlier.

### **Maintenance and Storage Facility**

An analysis of options for an LRT Maintenance and Storage Facility (MSF) was included within the scope of work for the Confederation Line West extension EA study, and maintenance requirements for servicing the Trillium Line extension was part of that project study. Both EA studies identified the size and number of any additional facilities required to house and service (both light and heavy maintenance) the trains required to operate Stage 2, including provisions for the ultimate requirement for Confederation Line to carry a peak capacity of 24,000 pphpd.

In the case of Trillium Line, it was determined that all the additional vehicles required to meet ridership growth could be stored and maintained at an expanded Walkley Yard facility, which is currently used to service the existing fleet. This analysis is captured in the Trillium Line Functional Design Report (Document 3). For the Confederation Line extension, 19 potential sites were examined for their potential to meet the following criteria:

- estimated land requirement of 5-15 hectares (to meet ultimate system demand);
- relative proximity to Confederation Line; and,

- land use and development potential.

The analysis determined that two sites, either on their own or in a combination, were capable of meeting the ultimate requirements for servicing the Confederation Line: the first one east of Woodroffe and north of Hunt Club Road (adjacent to the existing rail corridor), and the second an expanded Belfast Yard.

The actual requirements for the maintenance and/or storage of vehicles will be optimized through the procurement options analysis and preliminary engineering work. This assessment will also look at opportunities to store additional vehicles on tail tracks at terminus stations.

A budget has been preserved in the overall Stage 2 LRT Project budget to cover the costs of Maintenance and Storage Facilities needed to service the line.

Document 6 describes the locations and options for the expansion of the MSF in more detail.

### **Operations**

The ultimate configuration of the operations of all the Stage 2 LRT Project extensions will be determined through the procurement process which will focus on achieving ridership and service standards while maximizing flexibility to minimize capital, operations and maintenance costs. This will then be refined and finalized by Transit Services and tailored to demand. The information below is the scenario used by the functional design team to provide estimates for vehicle and associated operational infrastructure requirements.

The Confederation Line East and West extensions will use the same electrified technology and will operate as an expansion of the 12.5 km of the Confederation Line. Design of these extensions will therefore be influenced by operating requirements for the initial line, including, most notably, the need for right-of-way that supports rapid transit service and provides sufficient capacity to meet future demand. The design will also need to ensure that, consistent with the TMP, LRT is not a barrier to movement across the corridor by including pedestrian and cycling crossings and connections to and from surrounding communities.

During peak periods, trains will leave from each of Baseline Station and Bayshore Station every six to eight minutes. Trains from both of those points will come together at the junction south of Lincoln Fields Station, so that from Lincoln Fields Station through downtown, the trains will operate at a combined headway of every three to four minutes. At most off-peak times, trains will leave from Baseline and Bayshore Stations every 10 minutes, and will merge to provide a combined train service every five minutes from Lincoln Fields through downtown. Late in the evening on weekdays and in the evening on weekend, trains will run every eight to 15 minutes at all stations.

During peak periods, trains will leave from Place d'Orléans Station every four to six minutes. Additional trains will begin at Blair Station, so that sufficient capacity is provided to meet the actual ridership demand at all points on the line. During the morning peak period, approximately three of every four trains will begin at Place d'Orléans. At most off-peak times, trains will leave from Place d'Orléans Station every five to 10 minutes, and, with additional trains from Blair Station, will provide a train every five minutes from Lincoln Fields through downtown. Late in the evening on weekdays and in the evening on weekend, trains will run every eight to 15 minutes at all stations.

The design of the line will support the eventual operation of trains as frequent as every 1.5 minutes in each direction, to provide an ultimate capacity of 24,000 pphpd;

Special track work such as crossovers and pocket tracks will be provided at key locations to provide a degree of flexibility and better ensure reliability in the service plan, and allow for track maintenance during off peak. For passengers, the final destination of the trains will be clearly indicated on the front and the sides of the trains and through the passenger information systems on station platforms.

Bus transfer areas will be provided as required along the line with emphasis on terminus stations.

The Trillium Line extension will use the same technology as the current service; however, provision will be made to be able to run two-car trains at periods of high demand. As such, new platforms may be built and existing platforms may be lengthened.

### **Costs and Property Requirements**

The Stage 2 LRT Project is a package of three extensions, with the value of these extensions being best represented as one project. As a consequence, and subject to change based on the procurement options analysis, Stage 2 LRT Project will be procured as a single package. In order to maximize the competitive tension and flexibility for both the Preliminary Engineering team, and the ultimate design-build constructor, Stage 2 LRT project cost elements will be represented for the whole project instead of broken down by extension, as was done during the TMP.

Experience during the Confederation Line preliminary engineering and procurement process has also shown that, in the case of large scale infrastructure projects, it is beneficial to avoid breaking down the cost estimate to its various components (runningway, guideway, track tunnel, etc), including the contingency. By keeping the project costs whole, the City will be in a better position to drive competitive tension through the preliminary engineering and procurement phases.

Consistent with the Confederation Line project, and subject to the procurement model selected, an affordability cap will be set during procurement to drive the project teams to maximize competitive tension and use flexibility and innovation to maximum value at lowest cost. The purpose of the functional design cost estimate is to provide a high level comfort that the project remains on budget with an accuracy of +/- 20%.

#### *Stage 2 LRT Project Cost Estimate*

The TMP estimate for Stage 2 LRT Project was \$2.5B in 2013 dollars, and \$3B when escalated to time of spend.

The functional design cost estimates confirms the TMP estimate which estimated that the entire Stage 2 LRT Project could be constructed for \$3B (escalated to time of spend). Costs have been estimated in accordance to the Council approved Project Delivery Review and Cost Estimating ([link](#)) system. The estimate is based on a Class C Design Level Estimate.

This estimate includes:

- Trillium Line Extension to Bowesville;

- Confederation Line East Extension to Place d' Orléans;
- Confederation Line West Extension to Baseline and Bayshore;
- Maintenance and/or Storage Facility;
- All vehicles necessary for opening day ridership on the O-Train System;
- All Property Costs (details provided in section below);
- All City Design and Construction Management Costs including Project Office;
- Public Art and Park and Ride lots;
- Appropriate Project Contingency;
- All Procurement Costs including bid fees;
- Financing and Transaction Costs associated with an P3/AFP Procurement; and,
- Systems Integration.

### TRIM AND AIRPORT EXTENSION

Though not part of the TMP Affordable Network, the extension of the Confederation Line from Place d' Orléans to Trim and extension of the Trillium Line to the Ottawa Macdonald-Cartier International Airport, were costed as part of the EA work directed by Council.

### TRIM EXTENSION

The functional design level estimate for the extension to Trim is \$200M (2013\$) which includes three stations (Orleans Town Centre, Tenth Line and Trim) and the full interchange modification at Highway 174 and Trim Road to permit an at-grade Trim Station. It is recommended that if implemented, the Orleans Town Centre and Tenth Line stations would be reducing the overall cost of extending the line to Trim to \$135M (\$2013) or \$160M (escalated to time of spend) +/- 20%.

AIRPORT EXTENSION

The functional design level estimate for the Trillium Line extension to the Airport is \$130M (2013\$) or \$155M (escalated to time of spend). This includes a station at Uplands that will connect the Ernst and Young Centre and the cost of an integrated station at the Ottawa International Airport.

Below is a summary table of costs associated with building Stage 2, as well as the potential extensions to Trim and the Airport in both 2013 dollars and dollars escalated to time of spend:

**Table 1 - Stage 2 LRT Project Costs - Trim and Airport**

Element	2013\$	\$'s Escalated to Time of Spend
Stage 2	2 500 000 000	3 000 000 000
Extension to Trim	135 000 000*	160 000 000
Extension to Airport	130 000 000	155 000 000
<b>TOTAL</b>	<b>2 765 000 000</b>	<b>3 315 000 000</b>

- \*With Orleans Town Centre and Tenth Line Stations deferred.

*Property Acquisition*

The City's Real Estate Partnerships and Development Office (REPDO) will undertake the acquisition of real property interests in adherence with the Real Property Acquisition Policy, unless otherwise directed by the City Manager under delegated authority or City Council.

Negotiation is the preferred method of obtaining real property rights. Where project requirements must be met in a timely manner, or where negotiation is unsuccessful, expropriation may be considered.



Real property shall be acquired on the basis of market value, and where applicable, entitlements, as defined by the Expropriations Act, unless other considerations are included in the transaction and approved by City Council.

**PROPERTIES IMPACTED BY THE RECOMMENDED PLAN**

Recognizing the current functional design, the environmental assessment process has identified the need for approximately 45 parcels of private and public land along the alignment. Property requirements are a key component of the implementation plan and direction to staff is needed to begin the real estate transaction process to ensure that land can be secured, and the proper sequence of construction staging is possible to minimize disruption of traffic and property. Initial efforts will be directed at private owners to increase the time available to them to manage all work which may arise from the acquisition.

**REAL ESTATE SOLUTIONS**

In 2009, Council directed staff to engage future Confederation Line station adjacent property owners for station integration opportunities, as well as foster transit oriented developments and connection opportunities (Ref N°: ACS2009-ICS-PLA-0069). The objective was to improve the ridership experience and ridership volume to maximize the project's overall success.

Ongoing dialogue and negotiations led to property agreements with private sector land owners that have significantly enhanced station functionality and connectivity. Examples include securing six larger and functionally improved integrated tunnel station entrances in the downtown core from the EAs proposed 900 square foot sidewalk station entrance boxes, as well as a Memorandum of Understanding with the University of Ottawa for a land exchange in support of adjacent station development.

As the Stage 2 LRT Project focuses on bringing transit farther from the City's core where development is less intensive, there will be opportunities to integrate with future development. Recognizing this, subject to approval of this report, City Staff will continue to explore real estate opportunities and develop opportunities for station integration.

### **Stage 2 LRT Project Benefits and Business Case**

As part of the Environmental Assessment scope of work, and a requirement of the Federal and Provincial funding eligibility requirements the City commissioned a review of the benefits and business case for the Stage 2 LRT Project. The resulting study determined that with an estimated capital cost of \$2.5B (2013\$), the benefits, from both the quantitative and qualitative perspective, greatly outweighs the cost of the investment. The study concludes that from a benefits-cost perspective, this project is highly viable with a ration of 3.6. Below is a summary of some of the highlights from the study.

Investment in the Station 2 LRT Project will:

- Reduce GHG emissions by 155 000 tonnes and 4400 tonnes of tonnes of Criteria Air Contaminants a year by 2048;
- Reduce fuel consumption in the City by 78 million litres annually by 2048;
- Economic output of \$3.7B and will create 24,000 person-years of employment during the construction period alone;
- Over \$7.3 B in present value over a 25 year period for commuters (2023-2048), including;
- \$1.8B in vehicle operating savings;
- \$4.9B in travel time savings;
- \$611M in accident avoidance savings;
- Increase transit ridership by 10%;
- Increase auto mobile speeds by 14% and increase transit speeds by 10%; and,
- Save up to 10 minutes a day from each riders daily commute.

Further details can be found in the Business Case Study attached to this report as Document 7.

## **ADVANCING STAGE 2**

The Confederation Line project was designed with the assumption that the Confederation Line West extension would be built and operational in 2023 to address anticipated operational constraints at Tunney's Pasture including bus lay-by's located on PWGSC lands. To ensure that transit ridership remains unconstrained, to capture the estimate 10% ridership uplift, to capitalize on the recent federal and provincial funding announcements and to derive all the project benefits as early as possible, the Stage 2 LRT Project schedule is based on achieving an overall revenue service date of 2023. To achieve this schedule, preparatory work needs to be undertaken in 2015 and 2016 as outlined in this section, including updating the affordability model, a formal application for federal and provincial funding, completion of a procurement options analysis, and undertaking preliminary engineering. These preparatory activities are further discussed in the sections below.

### **Federal and Provincial Funding Request**

**Province of Ontario:** As part of the 2015 Provincial Budget, the Province of Ontario announced the creation of the *Moving Ontario Forward* fund—a \$31.5B fund for public transit and infrastructure in the Province that identifies \$16B for transit projects in the Greater Toronto and Hamilton Area (GTHA) and \$15B for transportation and other priority infrastructure projects outside the GTHA. Included in the 2015 Budget is a reference to Ottawa's Stage 2 project as an example of the projects this fund is intended to support.

**Government of Canada:** The Government of Canada has three relevant funds for major transit infrastructure funding, the New Building Canada Fund (NBCF) and the P3 Canada Fund. The NBCF is a \$14B fund that supports projects of national, regional and local significance and includes a \$9B Provincial-Territorial Infrastructure Component – National and Regional Projects (PTIC-NRP), of which, the Stage 2 LRT Project would be eligible for funding. In order to be considered for the PTIC-NRP fund, the Province must signal to the Minister of Infrastructure that the Stage 2 LRT Project is considered a Provincial priority project. As part of the City's formal funding request to the Province, the City will request that this letter be sent to the Government of Canada identifying the project as a priority. The NBCF also requires a detailed review of the project's business case. The Funding Business Case, summarized in Benefits Case

section of this report was developed and is tailored to address these requirements. This fund also requires all projects over \$100M to undertake a P3/AFP Screen, the work required for this screen is outlined in the sections below.

The P3 Canada Fund currently has \$1.25B identified for P3 projects across the country. The funding is determined by a board of directors, and is dispersed in funding rounds that last approximately a year and half. P3 Canada has recently closed its latest funding round, Round 7, that had a deadline of June 12, 2015 for the early screening application. In order to meet the Round 7 timelines, staff submitted the application to that funding round for the Stage 2 LRT Project. The timelines dictated in this round, require a formal Business Case to be completed and approved by Council in March 2016 that includes, a detailed procurement options analysis, market testing, a Value for Money (VfM) analysis and project design to be sufficiently advanced to have a project cost estimate independently certified as +/- 15%. The steps and funding required to meet these timelines are outlined below.

In the 2015 Federal Budget, a new Public Transit Fund (PTF) was established that provides \$6.5B (until 2024) for transit infrastructure and was allocated to P3 Canada to administer. The Stage 2 Project would appear to qualify under this permanent fund as it is dedicated to the construction and rehabilitation of large public transit projects of over \$1 Billion procured as a public-private partnership. The PTF will provide federal funding of up to one third of eligible costs, however further details on the program terms and conditions will only be available by fall 2015.

#### *Securing Federal and Provincial Funding*

On a per capita basis, the City of Ottawa would qualify for approximately \$2B of the \$15B available in the Moving Ontario Forward Fund for infrastructure priorities. Additionally, since the announcement of the Moving Ontario Forward fund, the Province has made transit infrastructure announcements that commit to 100% provincial funding for the Hurontario-Main LRT Project, the Hamilton LRT project and the Finch West LRT project in Toronto. Given this new infrastructure funding precedent in the Province, staff will engage with their provincial counterparts to explore options to secure the maximum contribution available from the Province towards the Stage 2 LRT Project.

Subject to Council's approval of this report and its recommendations staff will work with the federal and provincial governments to secure the maximum amount of funding available for the Stage 2 LRT Project.

### *Trim and Airport Extensions*

While the Trim and Airport extensions were not included in the Affordable Network of the Transportation Master Plan there is merit in exploring whether these extensions could be included in the overall Stage 2 LRT Project to capitalize on economies of scale and a mobilized LRT constructor. Consequently, subject to Council's approval of this report, staff will include the Trim and Airport Extensions in the funding discussions with the federal and provincial government and include it in the preliminary implementation work outlined in the sections below. Once the total funding amount from the federal and provincial government has been determined, staff will report back to Council on an updated affordability model, and recommendations on the final scope of the Stage 2 LRT Project. Recognizing that both extensions were identified in the TMP has having net operational cost pressures, if successful in achieving funding for these extensions staff will include the implications of these cost pressures in the affordability model, which will inform staffs ultimate recommendation on the Stage 2 LRT Project scope.

### **Procurement Options Analysis, Value for Money and Preliminary Engineering**

The Confederation Line project was procured as a Design Build Finance and Maintain Private Public Partnership (P3) or Alternative Financing and Procurement (AFP) project that resulted in a fixed price and schedule for project delivery. The success of the Confederation Line procurement and the federal funding requirement to undertake a P3 screen on all projects over \$100M has resulted in the staff including the incremental cost of the AFP private financing component as part of the project cost estimate.

As with the Confederation Line project, the City will undertake a detailed procurement option analysis, taking into consideration the additional complexity of having an existing design build finance and maintain consortium.

The objective of this procurement options analysis will be to recommend to Council the best procurement approach to meet the following goals:

- Ensure risk is assigned to the party best positioned to manage including interface risks;
- Securing senior government funding;
- Achieve a seamless customer experience on the entire system;
- Maximize value for money and competitive tension;
- Achieve cost and schedule certainty; and,
- Maximize innovation towards achieving the goals identified above.

Complementing this procurement options analysis, and contributing to the overall Business Case required for P3 Canada funding, as outlined in the section above on Federal and Provincial Funding Request, are the additional requirements of a Value for Money (VfM) analysis as well as the Preliminary Engineering Design Work.

#### *The Value for Money (VfM)*

VfM analysis identifies, through a series of risk workshops, the possible project risks and likelihood of occurrence and determines the likely quantitative value of this risk. The dollar value of this risk is then compared to the incremental cost of the P3 procurement model, resulting from the delta between the private and public (City) borrowing costs. If the cost of the risk is higher than the incremental cost of the private financing, then the project is considered to have value for money to be procured as a P3 as the risk would be transferred to the private sector for the cost of the financing. This work to identify and value risk transfer would be done in concert with the Procurement Options Analysis study.

#### *Preliminary Engineering*

Preliminary Engineering is the design work required to advance the project design from a functional design level (+/- 20% cost estimate accuracy) to a procurement ready design (+/-15% cost estimate accuracy). The scope of this work assumes a P3/AFP procurement model whereby the design will be advanced to 100% by the winning Design Build consortium. This work is necessary to give design certainty on project elements where the City would retain risk, and to clarify design elements to reduce bid

risk. It is also a requirement of the P3 Canada funding process. The preliminary engineering work will be guided by a Project Definition Report (PDR). The PDR outlines the scope of the preliminary engineering effort by clearly outlining the areas of design that require advancement, which design aspects should be left to the bidding teams, and confirms the City's position on fixed project elements (e.g. fare control, power supply, etc). The Stage 2 PDR report will be complete this fall, at which point, subject to Council's approval of this report and the necessary funding, staff will procure the team to begin the preliminary engineering work. This preliminary engineering work will be structured with work packages so if federal and/or provincial funding is not achieved for the project the preliminary engineering can be stopped without penalty and the design work achieved to that date will have residual value.

This procurement options analysis forms part of the business case requirements for P3 Canada funding and will be presented to Council for approval in 2016. The Preliminary Engineering work will form the basis of the next design report to Council that will seek authority to proceed to procure the project. This report will be presented to Council for approval, subject to federal and provincial funding announcements in 2016.

*Schedule of Business Case Development and Funding*

In order to meet the P3 Canada funding timelines, and to meet the overall critical path schedule for Stage 2 implementation, the aforementioned Business Case and Preliminary Engineering activities should be undertaken according to the following schedule:



Stage 2 Activity	2015												2016											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Project Definition Report (PDR)	█	█	█	█	█	█	█	█	█															
Preliminary Engineering						█	█	█	█	█	█	█	█	█	█	█	█							
Procurement Options Analysis						█	█	█	█	█	█	█	█	█										
Value For Money Analysis									█	█	█													
Council Report on Procurement Option														█										

In order to achieve these timelines, Stage 2 LRT Project funds will need to be expended in 2015 to advance these activities.

Subject to Council’s approval of this report, the \$7M in work to be advanced in 2015 will be funded through a capital budget adjustment from existing Park and Ride Capital Account (#903278) into the Stage 2 LRT Project account (#907926), as such, no new funding is required to the end of the year. The Stage 2 LRT Project scope currently includes the implementation of new or expanded Park and Ride lots at Bowesville, Leitrim and Place d’ Orléans, and staff have determined that this existing funding can be reallocated without any delivery impacts to the existing program. The Preliminary Engineering contract will be tendered to include work packages that can be cancelled if the Stage 2 LRT Project does not receive sufficient federal and provincial funding. The

funding required for the 2016 activities will be submitted for consideration in the City's 2016 Budget.

### *Infrastructure Ontario*

Infrastructure Ontario is a Crown Corporation owned by the Province of Ontario which provides a variety of services relating to the support and advancement of AFP or P3 projects. Infrastructure Ontario acted as the City's Commercial Procurement Lead for the Confederation Line project, providing Project Agreement template language and strategic advice on the project.

Since working on the Confederation Line project, Infrastructure Ontario has gained considerable experience in the AFP transit sector, having recently closed the City of Waterloo's Light Rail Transit Project and the Eglinton Crosstown Line in Toronto. In light of the success of the collaboration on the Confederation Line and to benefit from their accumulated experience, staff has secured the support of Infrastructure Ontario to provide strategic advice on the procurement option analysis for Stage 2 and in the development of the P3 Canada Business Case. Staff will present a recommendation to Council on the role of Infrastructure Ontario during the procurement of the Stage 2 LRT Project as part of the procurement option recommendation report in 2016.

### **Design Evolution and Advancement**

As outlined in the Cost Estimate section of the report, the Stage 2 LRT Project remains on budget with the TMP estimate of \$2.5B in 2013 dollars, or \$3B dollars escalated to time of spend. This project estimate, at the functional design level, is accurate to +/- 20%. Preliminary Engineering will advance the design to a level of detail sufficient for the procurement, which will raise the level of cost estimate accuracy to +/- 15%.

As with the Confederation Line project and in order to ensure that the project budget is maintained, the Preliminary Engineering team will be instructed to design to budget, meaning that they will use value engineering and other scope options to hold the budget to \$3B.

In order for a design to budget instruction to be effective, flexibility must be given to the Preliminary Engineering team. This flexibility will include the ability to explore reducing the size and scope of low volume stations, up to and including the removal of low

volume stations from the project all together. Ultimately any design modifications and flexibilities undertaken by the Preliminary Engineering team will be presented to Council for approval as part of the Council report authorizing staff to begin procurement on the Stage 2 LRT Project.

Like the addition of Trim and the Airport extensions, this flexibility will also work to maximize the value of the City's overall investment. The Preliminary Engineering team will be instructed to weigh value engineering and scope options with the possibility of capitalizing on procurement and competitive tension opportunities like the addition of the Trim and Airport extensions. All of these design decisions will be governed by the project's overall outcome objectives as dictated by the TMP with a focus on achieving the ridership and service objectives within the City's Affordability Envelope.

The same principles of flexibility and outcome-oriented performance specifications along with a careful examination of operations and policy criteria will guide the development of the procurement recommendations which will be presented for Council approval in 2016.

### **Implementation Schedule**

In order to ensure maximum ridership, capitalize on the recent Federal and Provincial funding announcements, and accrue the benefits of project implementation outlined throughout the report the Stage 2 LRT Project's schedule is designed to achieve revenue service in 2023. Below is an initial implementation schedule which will be refined through the preliminary engineering and procurement options analysis recommended procurement model. This schedule assumes federal and provincial funding agreements in place by 2019 and an AFP procurement model.

#### ***Stage 2 Preliminary Implementation Schedule***

<b>Schedule Element</b>	<b>Timing</b>	
	<b>Start</b>	<b>End</b>
<b>Project Definition Report</b>	<b>Ongoing</b>	<b>September 2015</b>
<b>Procurement Options Analysis</b>	<b>July 2015</b>	<b>March 2016</b>

including VfM		
Procurement Option Report to Council	Q1 2016	
Preliminary Engineering	July 2015	Q1 2017
Funding Agreement Negotiation	Q1 2016	Q3 2017
Design Update and Authorization for Procurement Report to Council	Q3 2016	
Request for Qualification	Q3 2016	Q1 2017
Request for Proposal & Evaluation	Q1 2017	Q1 2018
Council Approval to Award Contract	Q2 2018	
Contract Award	Q3 2018	
Construction	Q4 2018	Q1 2023
Revenue Service	Q4 2023	

### **Enabling and Bundling of City Projects**

As on the Confederation Line project, there are likely to be several planned infrastructure works ancillary and/or adjacent to the Stage 2 LRT Project that would benefit from being bundled into the project. This provides a benefit through economy of scale and eliminates schedule and other risks created with multiple contractors in the same construction zone, and instead, transfers these risks to a single Project Co. For Confederation Line, these projects were undertaken as “Cash Allowance Projects”. This meant that the City handed the projects over to RTG as fully designed projects with the associated budget with all design risk remaining with the City.

A lesson learned from the Confederation Line Project is that additional value could be achieved by bundling these ancillary projects during the procurement period so that they benefit from the full risk transfer and cost and schedule certainty of the main P3 contract. To this end, staff are seeking direction from Council to undertake a detailed

review of any City, Provincial or Federal projects (subject to agreement of the senior government partners) that are planned for implementation in the Stage 2 LRT Project construction timeframe and will recommend to Council as a part of the Design Update and Authorization Report whether these should be included in the overall project. In order for these projects to be bundled with full risk transfer it may be required that the design of any identified projects be refined to meet P3 design level subject to confirmation by Council as part of the report.

### **Stage 2 Governance (role of RIO, Steering Committee)**

In July 2011, Council approved the constitution of an Executive Steering Committee for the Confederation Line project which was made up of members of the City's Executive Committee and included representatives from Infrastructure Ontario and Metrolinx. It is recommended that the Stage 2 LRT Project report to the same Executive Steering Committee until the Procurement Options Analysis Report is brought to Council in Q1 2016, at which point, a formal governance structure for the Stage 2 LRT Project will be recommended for consideration and approval.

### **RURAL IMPLICATIONS**

The Stage 2 LRT Project will have significant City-wide benefits as outlined in the business case (Document 7).

### **CONSULTATION**

Consultation with interested persons is a cornerstone of the environmental assessment process and is a legal requirement of the Environmental Assessment Act. Consultation early on, and throughout, the process is also a key feature of environmental assessment planning.

Each of the planning and environmental assessment (EA) studies that make up the Stage 2 LRT Project are being undertaken in accordance with the transit project assessment process (TPAP) as prescribed in Ontario Regulation 231/08, Transit Projects. This is a two phase process that includes a Project Planning Phase and a Project Environmental Assessment Phase. These studies are nearing the completion of the first phase and feature a community consultation program in the preparation the selection of the preferred transit design. In general, the consultation program is based

on the requirements of the provincial Environmental Assessment Act and is designed to include interested persons such as adjacent property owners, regulatory agencies, municipal representatives, aboriginal communities and members of the public.

In general, the City of Ottawa exceeds provincial requirements and recommended practice for the notification and undertaking of consultation during its environmental assessment studies. A comprehensive consultation plan was carried out for each EA that included several rounds of public engagement at key milestones in the study process. Each round consisted of meetings with the Agency, Business and Public Consultation Groups prior to the Open House.

The Agency Consultation Group members included City departments, provincial and federal agencies, as well as utility companies. The Business Consultation Groups included local business associations and near-by and in many cases directly impacted business owners, while the Public Consultation Group members were represented by community associations and special interest groups.

The following First Nations groups were notified during each of the rounds of consultation:

- Algonquins of Ontario Consultation Office;
- Algonquins of Pikwakangan;
- Kitigan Zibi Anishinabeg First Nation; and,
- Métis Nation of Ontario.

Each of the summary appendices for the Confederation Line West, Confederation Line East and Trillium Line extensions contain details concerning their respective consultation activities and are contained in Documents 1,2 and 3, respectively.

#### **COMMENTS BY THE WARD COUNCILLOR(S)**

This is a City-wide report.

## **LEGAL IMPLICATIONS**

There are no legal impediments to implementing the recommendations in this report. The process hereunder for Stage 2 is similar to and, in some respects, identical to the process that was utilized in the environmental assessment and functional design of the Confederation Line.

## **RISK MANAGEMENT IMPLICATIONS**

High level project risks and mitigation strategies have been identified in the Business Case (Document 7) appended to this report. As part of the early implementation activities staff will undertake a detailed risk analysis to inform the Value for Money (VfM) exercise, the preliminary engineering work and the procurement process. Other risks have been identified and explained in the report and are being managed by the appropriate staff.

## **ASSET MANAGEMENT IMPLICATIONS**

Comprehensive Asset Management (CAM) is an integrated business approach involving planning, finance, engineering, maintenance and operations geared towards effectively managing existing and new infrastructure to maximize benefits, reduce risk and provide safe and reliable levels of service to community users. This is accomplished in a socially, culturally, environmentally and economically conscious manner.

The City's Comprehensive Asset Management (CAM) Program (City of Ottawa Comprehensive Asset Management Program) results in timely decisions that minimize lifecycle costs and ensure the long-term affordability of assets. To fulfill its obligation to deliver quality services to the community, the City must ensure that assets supporting City services are managed in a way that balances service levels, risk and affordability.

The recommendations support the delivery of services with the outward focus on community benefit and an inward focus on efficiency and affordability. More specifically, the recommendations of this report also align with several objectives of the Comprehensive Asset Management program such as:

- Evaluate long term considerations of present day decisions;

- Link infrastructure investment decisions to service outcomes; and,
- Aim at providing approved levels of service at the lowest life cycle cost.

Considering different perspectives like operations, maintenance, functionality, environment impacts, costs, etc.

### **FINANCIAL IMPLICATIONS**

This report recommends that additional capital expenditures related to advancing and securing the Stage 2 project (Account # 907926) in the amount \$7M be provided by way of a capital budget transfer from existing available transit capital budget funds in Park and Ride Account # 903278.

As outlined within the report, an update to the affordability analysis that was conducted in 2013 will be presented to Council once the federal and provincial contributions on the Stage 2 LRT Project and their implications on the overall model have been determined.

### **ACCESSIBILITY IMPACTS**

The Stage 2 LRT Project will be designed to meet the accessibility goals set by Council. The project team will continue to advance implementation of universal accessible design 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 will continue to work with the accessibility community to incorporate accessibility features into the detailed design work that has occurred to date. This project will be designed to comply with the *Ontario Building Code* ([link](#)) and to the greatest extent possible with the new *City of Ottawa Accessibility Design Standards*. 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 Stage 2 LRT Project remains 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.



The specific accessibility features planned for the Stage 2 LRT Project are built on the performance standards set by the Confederation Line project and 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;
- Signs will include the International Symbol of Accessibility, will consider colour contrast and large print and will be 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 accessible signage that indicate which seats are priority seats for persons with disabilities;
- All passengers have access to push buttons for access-door to request assistance 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 accessible wayfinding signage (large print, tactile, appropriate colour contrast);
- 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 and pedestrian design that make passenger wayfinding simple and intuitive.

## **ENVIRONMENTAL IMPLICATIONS**

The Stage 2 LRT Project will result in significant environmental benefits including reducing GHG emissions by 155,000 tonnes and 4400 tonnes of tonnes of Criteria Air Contaminants a year by 2048 and reducing fuel consumption in the City by 78 million litres annually by 2048. Further details on the environmental benefits of the project can be found in the Business Case (Document 7) of this report.

## **TERM OF COUNCIL PRIORITIES**

The work summarized in this report is supportive of the following Term of Council Priorities:

- TM1 - Ensure sustainable transit services;
- TM2 - Maximize density in and around transit stations;
- TM3 - Provide infrastructure to support mobility choices;
- TM4 - Promote alternative mobility choice;
- GP3 - Make sustainable choices;
- FS2 - Maintain and enhance the City's financial position; and,
- EP3 – Support growth of the local economy.

## **SUPPORTING DOCUMENTATION** *(distributed separately and held on file with the City Clerk)*

Document 1 – Confederation Line West Functional Design Report

Document 2 – Confederation Line East Functional Design Report

Document 3 – Trillium Line Functional Design Report

Document 4 – 100 Day Memorandum of Understanding

Document 5 – 100 Day Working Group Summary

Document 6 – Confederation Line Maintenance and Storage Requirements Report  
(Stage 2)

Document 7 – Stage 2 LRT Project Benefits and Business Case

**DISPOSITION**

Upon Council approval, staff will implement the recommendations outlined in this report.