Report to / Rapport au :

Transit Committee
Comité du transport en commun

and Council / et au Conseil

09 December 2009 / 09 décembre 2010

Submitted by/Soumis par : Nancy Schepers, Deputy City Manager/Directrice municipale adjointe,
Infrastructure Services and Community Sustainability/Services d'infrastructure et Viabilité des collectivités

Contact Person / Personne-ressource : Vivi Chi, Manager / Gestionnaire, City-wide Transportation Planning / Transports urbain, Planning and Growth Management/Urbanisme et Gestion de la croissance
(613) 580-2424 x21877, vivi.chi@ottawa.ca

City-wide Ref N°: ACS2009-ICS-PGM-0214

SUBJECT: **DOWNTOWN OTTAWA TRANSIT TUNNEL (DOTT) PLANNING AND ENVIRONMENTAL ASSESSMENT STUDY - RECOMMENDED PLAN**

OBJET : **PLANIFICATION ET ÉVALUATION ENVIRONNEMENTALE DU TUNNEL DE TRANSPORT EN COMMUN DANS LE CENTRE-VILLE D'OTTAWA (TTCCVO) - PLAN RECOMMANDÉ**

REPORT RECOMMENDATIONS

That the Transit Committee recommend that Council:

1. **Approve the functional design for the Light Rail Transit (LRT) corridor from Tunney's Pasture to Blair Station and the Maintenance and Storage Facility as described in this report and detailed in Document 1.**

2. **Direct staff to initiate a formal, expedited Environmental Assessment (EA) process based on the approved functional design, and file the Environmental Project Report with the Ministry of the Environment in accordance with Ontario EA Regulation 231/08 for transit projects.**

3. **Direct staff to begin the property acquisition process as described in this report for subsequent consideration by Committee and Council, subject to funding approval in the 2010 Budget.**

4. **Direct staff to initiate the preliminary engineering and the procurement management process as described in Document 3, subject to funding approval in the 2010 Budget.**

5. **Direct staff to undertake an urban design study and a transportation study for the downtown that takes into account pedestrian, cycling facilities and residual transit service for post-DOTT implementation.**

RECOMMANDATIONS DU RAPPORT

Que le Comité du transport en commun recommande au Conseil :

1. **D'approuver la conception fonctionnelle du corridor pour le train léger sur rail (TLR) entre le pré Tunney et la station Blair, de même que l'installation d'entretien et de remisage, comme le propose le document n^{o} 1.**

2. **D'enjoindre le personnel d'amorcer le processus officiel d'évaluation environnementale (EE) d'après la conception fonctionnelle afin de définir le projet et de déposer le rapport de projet environnemental auprès du ministère de l'Environnement conformément au règlement sur l'EE 231/08 de l'Ontario pour les projets de transport en commun.**

3. **D'enjoindre le personnel d'amorcer le processus d'acquisition des propriétés conformément au document n^{o} 1 et sous réserve de la demande d'un fonds de capital et d'emprunt pour 2010.**

4. **D'enjoindre le personnel d'amorcer le processus d'ingénierie préliminaire et de gestion des acquisitions conformément au document n^{o} 3 et à la demande d'un fonds de capital et d'emprunt pour 2010.**

5. **D'enjoindre le personnel d'entreprendre une étude de conception urbaine et une étude du transport pour le centre-ville qui tiennent compte des piétons, des pistes cyclables et du service de transport en commun résiduel pour la période suivant la mise en œuvre du TTCCVO.**

EXECUTIVE SUMMARY

Background

The purpose of the Downtown Ottawa Transit Tunnel (DOTT) Planning and Environmental Assessment Study is to develop a plan for a new electrified grade-separated rapid Light Rail Transit (LRT) facility that follows Council's November 2008 decision to move forward with Phase 1, Increment 1, of the Transportation Master Plan (TMP). In May 2009 City Council approved the preferred corridor alignment and station locations (Report Number ACS2009-ICS-PLA-0069). The preferred alignment was based on an evaluation using a set of criteria developed for a grade-separated LRT system and forms an important part of the planning phase of the study.

The substantive recommendation outlined in this report is to approve the recommended plan for the DOTT. The project is approximately 12.5 kilometres of new electrified light rail transit, between Tunney's Pasture and Blair Stations, primarily on the existing Transitway corridor. Thirteen LRT stations have been identified along this route, which includes four underground stations serving downtown and the University of Ottawa Campus Station in a 3.2-kilometre long tunnel. The DOTT's western portal will be located east of LeBreton Station near Brickhill Street and runs through the downtown core area until it veers south easterly and reaches grade at a portal south of Campus Station. In addition, the recommended plan includes a maintenance and storage facility to support LRT operations in the vicinity of St. Laurent Boulevard, south of the Queensway.

A discussion of the rationale for the recommended plan and summary of additional work undertaken since Council approval of the alignment and station options in May 2009 is provided in the report and supporting documentation as well as information pertaining to issues arising during consultation with key stakeholders and the public. Approval of the recommended plan will lead to activities related to commencement and completion of the Environmental Assessment (EA). Provided that funding is available, initial steps towards implementation of this project in accordance with an approved EA are also being recommended.

The DOTT study is the City's first project to follow the expedited maximum six-month EA process for transit projects. Ontario Regulation 231/08 allows proponents to build on past planning decisions to advance a transit project through an EA. Major planning issues that were addressed in the Council-approved rapid transit network as described in the 2008 TMP, and its supporting documents, do not have to be revisited in the EA – such as project need, corridor development (surface versus tunnel), technology assessment (buses versus trains). However, there are other detailed, project-specific planning matters to address subsequent to the approval of the TMP, and the Province assumes that these details are resolved, resulting in a recommended solution, before the EA process is initiated. The results of the detailed planning study for the DOTT project (i.e. the functional design) are described in this report and the approval of Transit Committee and Council is being sought.

The functional design constitutes the technical content of the Environmental Planning Report (EPR). With Council's approval of the functional design, staff will initiate the formal EA process to include final public consultation and the submission of the EPR to the Ministry of the Environment. Subject to unforeseen issues, no other report will be forwarded to Council on the planning/EA component of the DOTT project.

Legal/Risk Management Implications:

There are no legal/risk management impediments to implementing this report's recommendations.

Financial Implications:

The capital cost estimate is $2.1B, in 2009 dollars. This includes allowances for property acquisition, design, project management, construction, vehicles, and contingency. The estimate does not include escalation and is subject to refinement as the project progresses through subsequent design phases.

In a memo dated 23 October 2009 to the Mayor and members of Council from the Deputy City Manager and City Treasurer, the affordability of the DOTT project (as well as other rapid transit projects identified in Phase 1 of the TMP) was outlined. It was concluded, in accordance with the City's Fiscal Framework, that the City has the financial capacity to afford its share of all Phase 1 projects. The affordability model assumes two-thirds funding from senior levels of government.

Public Consultation/Input:

To date, the study has involved over 150 stakeholder groups, including community organizations, property owners and businesses within the study area, institutions, approval agencies and groups with a special interest in the study. In addition several Agency, Business and Public Consultation Group meetings (up to six meetings each), three formal Public Open Houses and presentations were conducted in February, June and October 2009. Individual meetings were also arranged with groups such as the Downtown Coalition, Viking Rideau Corporation, the University of Ottawa, Canadian Environmental Assessment Agency (CEAA), Public Works and Government Service Canada (PWGSC) and the National Capital Commission (NCC). A project website (www.ottawa.ca/tunnel) was established along with a dedicated e-mail address (dott@ottawa.ca) to allow the public to contact the study team directly.

Overall, there is strong public support for this project. Other comments pertain to specific details of the functional design.

RÉSUMÉ

Contexte

L'étude de planification et d'évaluation environnementale du tunnel de transport en commun dans le centre-ville d'Ottawa (TTCCVO) a pour but de tracer le plan d'une nouvelle installation de transport en commun par train léger sur rail (TLR) rapide à passages superposés électrifiés, conformément à la décision de novembre 2008 du Conseil de mettre en œuvre l'augmentation 1 de la phase 1 du Plan directeur des transports (PDT). En mai 2009, le Conseil municipal a approuvé le tracé et l'emplacement préférés des stations et du corridor (rapport numéro ACS2009-ICS-PLA-0069). Le tracé préféré reposait sur une évaluation faite à l'aide de critères élaborés pour un réseau de TLR à passages superposés et représente une partie importante de l'étape de planification de l'étude.

La principale recommandation de ce rapport consiste à approuver le plan recommandé du TTCCVO. Le projet comprend l'aménagement d'un nouveau tronçon de 12,5 kilomètres par train léger sur rail électrifié entre le pré Tunney et la station Blair, en grande partie à même le corridor du Transitway. On a identifié 13 stations de TLR sur l'itinéraire proposé, qui comprend quatre stations souterraines pour le centre-ville et la station Campus de l'Université d'Ottawa le long d'un tunnel de 3,2 kilomètres. Le portail ouest du TTCCVO sera aménagé à l'est de la station LeBreton près la rue Brickhill et se prolongera au centre-ville pour ensuite revenir vers le sud-est jusqu'à un portail situé au sud de la station Campus. De plus, le plan recommandé comprend une installation d'entretien et de remisage qui appuie les opérations du TLR près du boulevard Saint-Laurent, au sud du Queensway.

Une discussion de la justification du plan recommandé et du résumé des travaux supplémentaires entrepris depuis l'approbation du tracé et du choix des stations par le Conseil en mai 2009 est présentée dans le rapport et dans la documentation à l'appui, de même que des renseignements sur les enjeux mentionnés pendant la consultation auprès des principaux intervenants et du public. L'approbation du plan recommandé mènera à la mise en place et à l'achèvement de l'évaluation environnementale (EE). Si les fonds sont disponibles, on recommandera aussi les premières étapes qui déboucheront sur la mise en œuvre de ce projet conformément à l'EE approuvée.

L'étude du TTCCVO est le premier projet de la Ville qui suit le processus accéléré d'EE d'une durée maximale de six mois pour les projets de transport en commun. Le Règlement de l'Ontario 231/08 permet aux promoteurs de s'appuyer sur les décisions de planification antérieures pour faire avancer un projet de transport en commun jusqu'à l'étape de l'EE. Les principaux enjeux de la planification abordés à l'égard du réseau de transport en commun rapide approuvé par le Conseil et décrits dans le PDT de 2008 et dans les documents à l'appui n'ont pas à être réexaminés dans l'EE – comme le besoin du projet, le tracé du corridor (en surface ou sous terre), l'évaluation de la technologie (autobus ou trains). Cependant, après l'approbation du PDT, d'autres questions détaillées liées à la planification du projet doivent être résolues, et la province tient pour acquis que ces détails ont été réglés et ont donné lieu à la recommandation d'une solution avant la mise en œuvre du processus d'EE. Les résultats de l'étude de planification détaillée du projet TTCCVO (c.-à-d. sa conception fonctionnelle) sont décrits dans ce rapport, et on demande l'approbation du Comité des services de transport en commun et du Conseil.
La conception fonctionnelle représente le contenu technique du rapport de planification environnementale (RPE). Dès que le Conseil aura approuvé la conception fonctionnelle, le personnel amorcera le processus officiel d'EE qui comprend la dernière consultation publique et la présentation du RPE au ministère de l'Environnement. À moins de problèmes imprévus, aucun autre rapport ne sera acheminé au Conseil sur la planification/composante EE du projet TTCCVO.

Répercussions juridiques/sur la gestion du risque :

Aucun empêchement juridique ni autre problème de gestion du risque n'interdisent de mettre en œuvre les recommandations de ce rapport.

Répercussions financières :

Le coût d'investissement est estimé à 2,1 milliards de dollars, en dollars de 2009. Ce montant comprend les allocations pour l'acquisition des propriétés, la conception, la gestion du projet, la construction, les véhicules et un fonds de prévoyance. L'estimation ne comprend pas l'indexation et elle est susceptible d'être corrigée à mesure que le projet franchira dans les autres étapes de conception.

Dans une note en date du 23 octobre 2009 au maire et aux membres du Conseil, la directrice municipale adjointe et la trésorière de la Ville ont souligné l'abordabilité du projet TTCCVO (de même que d'autres projets de transport en commun rapide mentionnés à l'étape 1 du PDT). Conformément au Cadre financier de la Ville, on a conclu que la Ville avait la capacité financière d'assumer sa part de tous les projets à l'étape 1. Le modèle d'abordabilité repose sur une hypothèse de financement aux deux tiers de la part des paliers supérieurs de gouvernement.

Consultation publique / commentaires :

Jusqu'à maintenant, plus de 150 groupes d'intervenants ont participé à l'étude, notamment des organismes communautaires, des propriétaires de propriété et des entreprises dans la région à l'étude, des institutions, des organismes d'approbation et des groupes manifestant un intérêt particulier dans l'étude. En plus de plusieurs réunions d'organismes, d'entreprises et de groupes de consultation publique (jusqu'à six réunions dans chaque cas), trois réunions et présentations officielles publiques ont eu lieu en février, en juin et en octobre 2009. Des rencontres individuelles ont aussi eu lieu avec des groupes comme la Coalition du centre-ville, la Société Viking Rideau, l'Université d'Ottawa, l'Agence canadienne d'évaluation environnementale (ACEE), Travaux publics et Services gouvernementaux Canada (TPSGC) et la Commission de la capitale nationale (CCN). Un site Web du projet (www.ottawa.ca/tunnel) a été créé de même qu'une adresse électronique (dott@ottawa.ca) pour que le public puisse communiquer directement avec l'équipe du projet.

Dans l'ensemble, le public appuie fortement ce projet. Les autres commentaires ont trait aux détails particuliers de la conception fonctionnelle.

BACKGROUND

Previous Approvals and City Initiatives

On 12 September 2007, Council directed staff to initiate a Planning and Environmental Assessment (EA) study for The Downtown Ottawa Transit Tunnel (DOTT). At that time, a number of initiatives were discussed to show how the City can move forward with a number of transit related activities to implement a new vision for providing transit service in the downtown area and reinforcing the goal of a city-wide 30 per cent transit modal spilt.

The timing of a downtown tunnel option was discussed in the context of the Transportation Master Plan and strategic rapid transit network development. It was acknowledged that an electrified light rail transit tunnel was an important component in addressing transit service improvements required now and in the future. Subsequently, the Statement of Work for the transit tunnel study was approved at a joint Transportation and Transit Committee meeting on 21 November 2007, which identifies the scope of the study and the level of effort to undertake the work. The Downtown Ottawa Transit Tunnel Planning and Environmental Study was initiated in June 2008.

Originally, the DOTT study area spanned from Bayview Station through the downtown core, between Wellington Street and Laurier Avenue West, to King Edward Avenue (and encompassed Lowertown West and the By-ward Market areas), and extended southerly to include Hurdman Station and the VIA Rail Station. On 26 and 28 November 2008 Council, during its deliberation of the draft 2008 Transportation Master Plan, approved a staff recommendation to extend the study limits to include Tunney's Pasture Station in the west and Blair Station in the east. This would align the scope of the Study with the light rail transit portion of Phase 1, Increment 1, of the City's rapid transit network.

The DOTT study considers environmental impacts, system operational issues and relevant on-going studies and projects while identifying tie-ins to future network connections. In this regard, the DOTT study ensures cohesion in implementing Council policy as it pertains to land use regulation, transportation and infrastructure planning, urban design and smart growth efforts and mitigation of the environmental impacts of the project. Completed and on-going studies that have and are being taken into account include the Interprovincial Core Area Rapid Transit Integration Strategic Planning Study, Ottawa Cycling Plan, Escarpment Community Design Plan (CDP), Bayview-Carling CDP, Wellington Street West CDP, Rideau Street Urban Design Study, Nicholas-Mann Gateway Precinct Design Plan, Downtown Ottawa Urban Design Strategy and, Federal Land Use Strategy, NCC Plan for Canada's Capital, Canada's Capital Core Area Sector Plan, LeBreton Flats Plan, Booth Street Bridge and LeBreton Station Design Guidelines Sussex/Rideau/Colonel By Landmark Node Study.

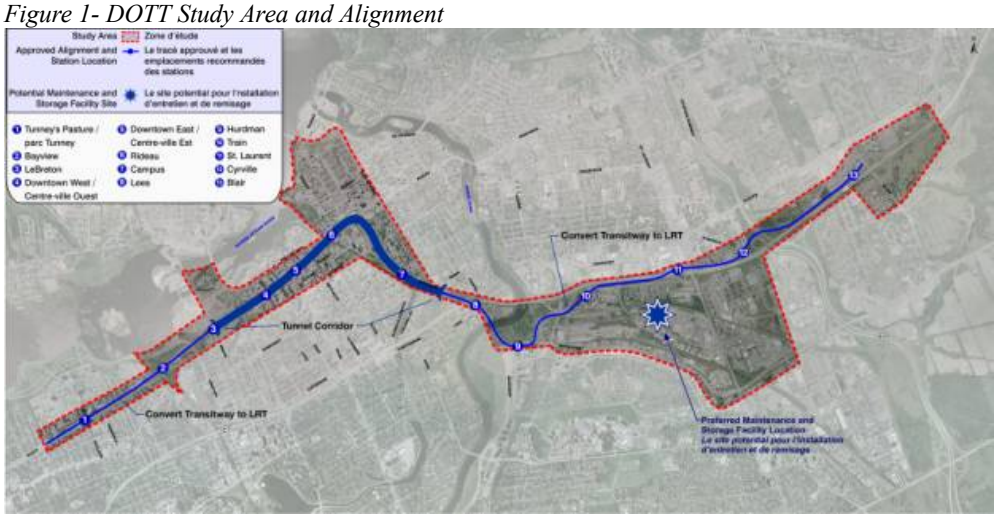
Council approved the Downtown Ottawa Transit Tunnel Planning and Environmental Study (Interim report) – Corridor Alignment and Station Alternatives report on 27 May 2009. A series of recommendations were approved including the recommended alignment and station options for DOTT. Other recommendations directed staff to undertake a number of activities related to the project including release of a Request for Information; a bus operation plan for Albert Street in the vicinity of LeBreton Flats; a conceptual transit plan for surface operations; incorporating principles related to transit service and operations of the Rideau commercial district; and, reporting on issues related to the Transit System during construction of the project. These matters have been addressed, separately reported upon by Transit Services, and incorporated in the planning study as appropriate. Further on, this report addresses options for bus operation during construction of DOTT.

The new transit facility will see the construction of approximately 12.5 kilometres of new electrified light rail transit, between Tunney's Pasture and Blair Stations. Thirteen LRT stations have been identified along the proposed route. Each station will be designed to accommodate 180 metres long platforms (for future train lengths needed beyond the 2031 planning horizon). The tunnel will span approximately 3.2 kilometres with four stations below grade serving downtown and the University of Ottawa campus station.

East and west of the downtown tunnel the existing Transitway will be converted from bus rapid transit to light rail transit technology. Approximately nine kilometres of the alignment, outside of the tunnel portion of the corridor, account for conversion of the existing Transitway. The introduction of rail transit also requires the construction of a maintenance and vehicle storage facility in the vicinity of the LRT corridor at the eastern end of the system.

The general alignment and design of the stations are described below. Figure 1 provides a general overview of the stations within the corridor.

Figure 1- DOTT Study Area and Alignment



Technology Report

The Rail System Selection Report was approved by Council on 25 November 2009, with the following recommendation:

- That Transit Committee recommend that Council approve that the Rail technology for the City's Rapid Transit Plan be Light Rail Transit (LRT).

Essentially the decision by Council for light rail will ensure that this and future light rail projects:

- Have less impact on the urban fabric and allows the ability to integrate both non-segregated and segregated systems;
- Provides the necessary capacity for the ridership predictions in the main core;
- Can accommodate low passenger capacity in the extensions outside of the main core;
- Has lower total system capital costs than Light Metro; and,
- Can accommodate Ottawa weather conditions.

The Planning and EA Process

The DOTT study is the City's first project to follow the expedited maximum six-month EA process for transit projects. Ontario Regulation 231/08 came into effect in June 2008 and allows proponents to build upon past planning decisions to advance a transit project through an EA. In other words, with the Council-approved rapid transit network as described in the 2008 TMP and its supporting documents, major issues such as project need, corridor development (including surface versus tunnel), and technology assessment (such as buses versus trains) were thoroughly assessed through that planning exercise and do not have to be revisited in the development of the EA for the DOTT project. The Regulation also dispenses of the need for the study Terms of Reference, once a requirement for transit Individual EAs. This and the ability to refer to past planning decisions save considerable time and effort and allow environment-friendly transit projects to progress more quickly towards implementation than before.

The maximum six-month EA transit process is primarily for public consultation, documentation, and provincial approval of the Environmental Project Report (EPR). Once the EPR is submitted to the Ministry of the Environment, the approval period is 35 days (this is within the six-month timeline). If the Minister does not render a decision by the end of the 35th day, the project is considered approved. Should there be bump-up requests, the scope of those requests is now limited to matters of provincial interest only: natural environment; cultural heritage values or interests; and constitutionally protected aboriginal or treaty rights.

In developing Regulation 231/08, the Province assumes that the detailed planning effort is completed resulting in a recommended solution before the EA process is initiated. The results of the detailed planning study for the DOTT project (i.e. the functional design) are described in this report and the approval of Transit Committee and Council is being sought.

It should be noted that the functional design constitutes the technical content to be included in the EPR. With Council's approval of the functional design, staff will initiate the formal EA process to include final public consultation and the submission of the EPR to the Ministry of the Environment. Subject to unforeseen issues, no other report will be coming back to Council on the planning component of the DOTT project.

DISCUSSION

The need for the DOTT Study is based on the acknowledgment that delays and congestion in the downtown area are significant and of great concern when planning for the redevelopment of the core area and meeting existing and future transportation needs of the City and adjacent municipalities.

Transit through downtown accommodates over 10000 riders per direction during peak hours. Currently, transit service is limited to approximately 180 buses an hour along Albert and Slater Streets during peak times to meet travel demand. Effectively, the transit system has reached its capacity in providing Bus Rapid Transit service through the downtown to serve surrounding communities. The system will no longer be able to expand service beyond 2018.

The TMP aims to implement a series of initiatives whereby electrified light rail will:

- Increase transit ridership and improve transportation services throughout the region, and in particular, the downtown core area;
- Provide the transportation infrastructure needed to support the City's projected population and employment levels for the year 2031.

The most significant initiative, and the subject of the DOTT study, is to:

- Construct a tunnel across downtown Ottawa;
- Convert the existing Transitway between Tunney's Pasture and Blair Station from bus to rail technology.

As directed by Council, light rail transit will follow the established Transitway route between Tunney's Pasture Station and Blair Station via a tunnel through the downtown to replace the existing on-street downtown transit. The need for LRT has been established through the TMP exercise and Council approved the choice of LRT technology on 25 November 2009 after consideration of this matter in an earlier report.

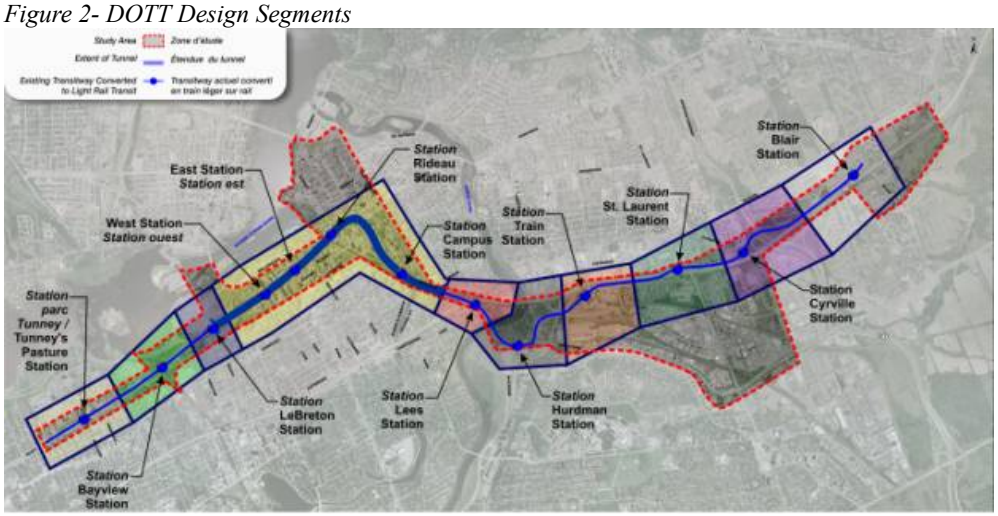
The Recommended Plan

The Recommended Plan for the DOTT project considers construction, operational and maintenance issues in preparation of the design. Since the approval of the LRT alignment and station options by Council, staff has worked to further define the alignment and station designs, as well as develop project staging and costing information. A detailed description of the Recommended Plan is contained in Document 1. The following summary provides an overview of the Recommended Plan, and focuses on specific areas where changes are recommended to the alignment and station options approved by Council in May 2009.

Design Segments

To comprehensively undertake this study, the project was divided into 10 design segments, described as follows and illustrated in Figure 2.

Figure 2- DOTT Design Segments

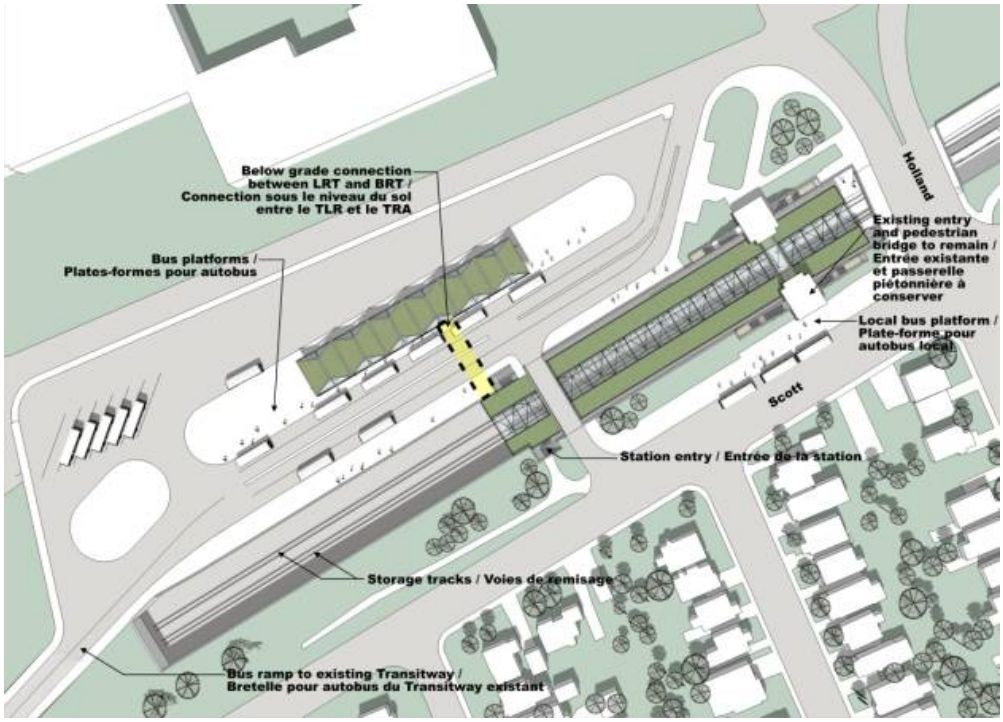


Tunney's Pasture Station

Tunney's Pasture Station will serve as the western terminus for the DOTT and accommodate transfers from BRT service from the west and southwest until such time that the LRT system is expanded further to Baseline Station in accordance with the TMP (subject to a future Planning and Environmental Assessment Study). The Station will accommodate bus and rail transfers for approximately 9000 passengers per hour during peak operating times. There will be a need to have some transit continuing on Scott Street to facilitate connections to the O-Train and Gatineau services at Bayview and LeBreton stations. Bus operation on Scott Street will be minimized to mitigate the impact on adjacent lands and allow the federal campus to proceed with its development initiatives. Integration of the station with future PWGSC development plans for the Tunney's Pasture employment node can be accommodated. Once LRT is extended to Baseline Station and the BRT transfer facilities are no longer required, these lands can be re-purposed for development. The planned underground pedestrian connection between the BRT and LRT platforms would provide for direct access into any building located on this site.

The recommended design for Tunney's Pasture follows the "Parallel" Design Option approved by Council in May 2009. This option converts the existing BRT platforms in the Transitway trench to 120 m long LRT platforms in a side-platform configuration. Protection for future platform extension (to the east) to allow 180-metre long LRT platforms is accommodated. A temporary BRT terminal located on the north side of the existing Transitway corridor would provide turn-around facilities for BRT buses and a waiting area for passengers. This facility would be reached via an existing (modified) bus ramp located to the west of the station. Existing bus stop facilities along Scott Street would remain to serve local service. Passenger flows between the BRT and LRT platforms would be accommodated by an underground passageway extending from the north LRT platform. To enable access to the south LRT platform, an at-grade crossing of the tracks would be permitted. This crossing would be beyond the normal operating area of the LRT. Two storage tracks (120 metres long) would be provided west of the LRT platforms to accommodate out of service trains. Cross-over tracks would be located to the east of the station to allow trains to be reverse direction at this terminus station. An enclosed platform canopy would cover the full length of the LRT platforms to protect passengers from inclement weather and reduce on-going winter maintenance costs (see Document 1 for more details). The design of Tunney's Pasture Station considers and seeks to accommodate the Tunney's Pasture master plan for redevelopment and future EAs such as the Western LRT Corridor EA as described in the TMP.

Figure 3 – Tunney's Pasture Station



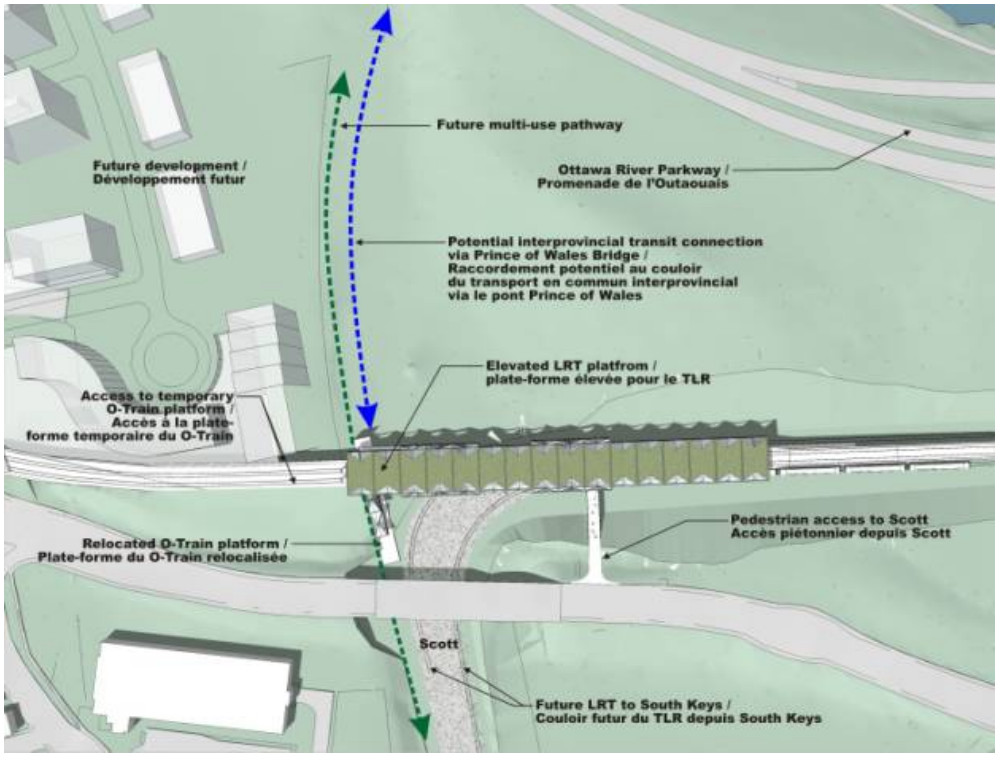
Bayview Station

Bayview Station will be a transfer point between the DOTT and the existing O-Train and a future expanded and electrified North-South LRT. Additionally, the design must consider the potential for interprovincial transit service via the Prince of Wales Bridge. As the station site is located adjacent to the Bayview and Somerset Area redevelopment lands, potential integration of the station design into future development is important. The alignment and new LRT station design therefore seeks to maximize the development potential for lands adjacent to the station that are in both public and private ownership. A concept plan for the City's Bayview site and the Bayview-Carling Community Development Plan have been considered in the preparation of the recommended design to assure consistency with these plans. Provision for a planned off-road multi-use pathway to be located along the west side of the existing O-Train corridor has also been considered in the design of Bayview Station.

The recommended design for Bayview Station follows the approved "Direct to Downtown" design option approved by Council in May 2009. The configuration provides for eventual through movements to/from the North-South LRT line to the core area without having passengers transfer and addresses a direct connection to the core from the Airport and between Carleton University and the University of Ottawa, when the North-South line is converted to electrified light rail as identified in the TMP. Bayview Station has also been designed to not preclude transit alternatives being investigated through the Interprovincial Transit Integration Study that is currently underway. If that strategic planning study recommends the Prince of Wales Bridge as the interprovincial transit corridor, a separate EA is required.

During the functional design phase several refinements to the station design have been made. The location of the station has been shifted north of the existing Transitway alignment so that the majority of the construction activities required at this location can occur without the need to close the Transitway for an extended period of time. After construction of the station, the existing Transitway bridge would be removed. Instead of a stacked centre-platform configuration, a side-platform configuration for the DOTT platforms is proposed on the upper level of the station, linked by a mezzanine level to a lower level centre-platform for the future North-South LRT. The mezzanine level located between the two platform levels would allow for pedestrian connections to Scott Street and to future development lands located north of the station. The existing O-Train platform would be relocated to the west, along the alignment of the existing rail corridor. The lower level platform area could be used as a temporary bus platform and turnaround facility until the electrified North-South LRT is constructed.

Figure 4- Bayview Station

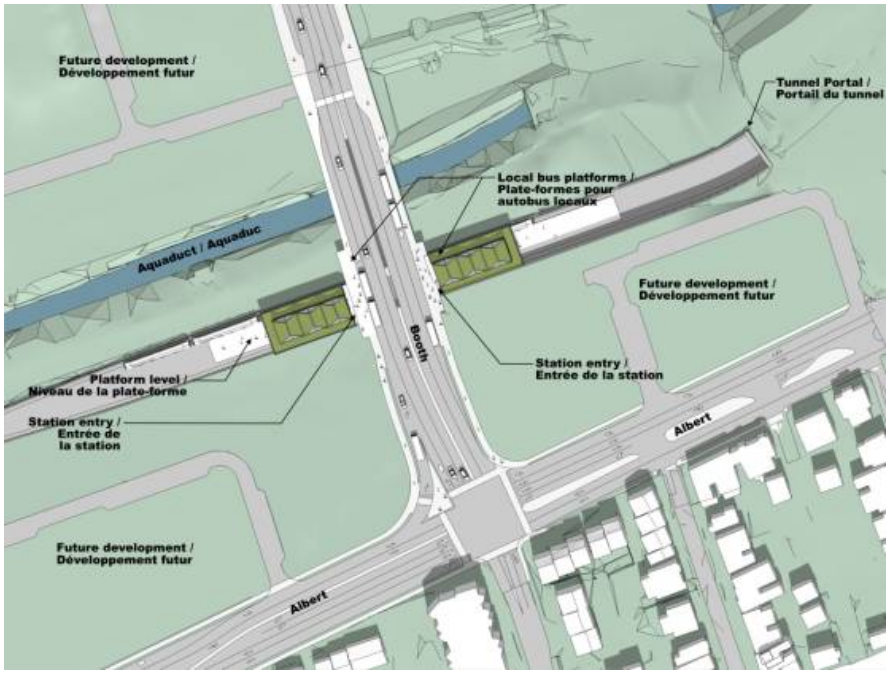


LeBreton Station

LeBreton Station will serve as a transfer point for OC Transpo bus service to/from Gatineau. The station is located within the NCC LeBreton Flats development lands and the LRT alignment through this area follows the previous rapid transit alignment agreed to between the City and NCC as part of the previous North-South LRT project. The station can be directly integrated into future development on NCC lands and will also support development on the City's adjacent Escarpment Area development lands. The LRT alignment east of LeBreton Station has been designed to maximize the development potential of these lands by curving north under the former Wellington Street right-of-way before entering the tunnel west of Bronson Avenue.

The recommended design for LeBreton Station follows the approved "Buses on Booth/Albert" design option. The configuration provides for a reconstructed Booth Street bridge spanning the existing aqueduct and the new LRT alignment above the station, which will have 120 metres LRT platforms in a centre-platform configuration, expandable to 180 metres long to accommodate six-car trains in the future. One station entrance located on each side of the new Booth Street bridge structure will be provided, with escalators, elevators and stairs giving access to the LRT platforms. Local bus platforms on Booth Street for northbound and southbound buses would be located on the upper level of the station. To accommodate bus operations at the Albert/Booth intersection, a widening to accommodate double left-turn lanes in the eastbound direction and a dedicated right-turn lane in the westbound direction is provided. All other lanes, and permitted turning movements, remain unchanged.

Figure 5: LeBreton



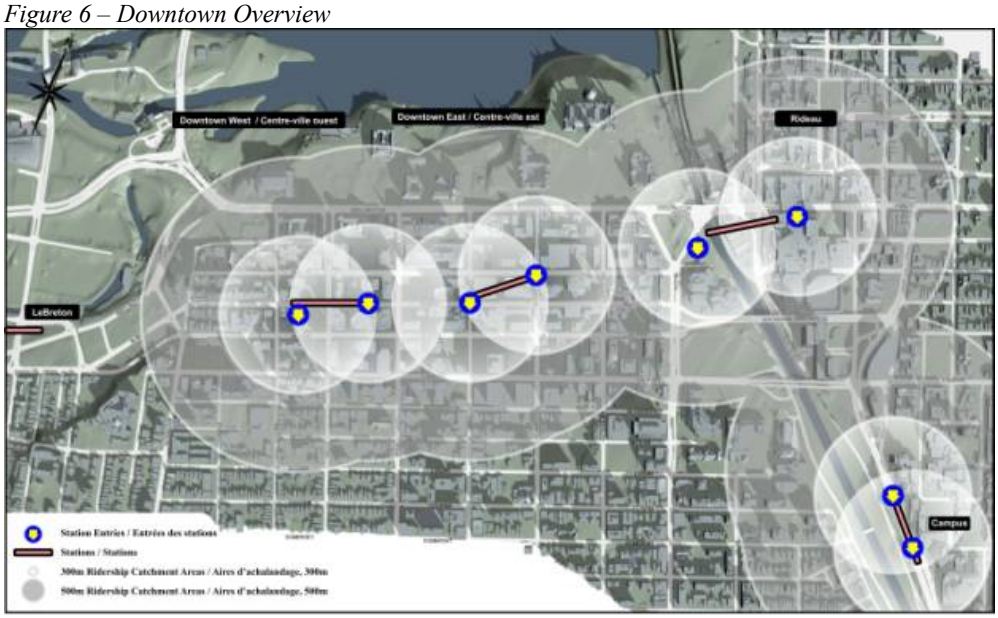
Downtown Transit Tunnel

Between LeBreton and Mann Avenue, a tunnel will be constructed to replace the current on-street bus lanes. This will separate rapid transit from surface disruptions and provides capacity for future demand, providing fast, efficient and reliable rapid transit through the downtown.

The tunnel through downtown Ottawa follows the approved "cross-country" alignment and includes the following major elements:

- West tunnel portal located east of LeBreton Station
  - Tunnel Boring Machine (TBM) launch area will be an open cut between LeBreton Station and Bronson Avenue (for the duration of construction only)
  - A standard poured-in-place concrete structure will be built in this area once TBM work is complete, to reinstate existing local roads and accommodate future development
- Four underground stations:
  - Downtown West
  - Downtown East
  - Rideau
  - Campus
- East tunnel portal located south of Mann Avenue.

Figure 6 – Downtown Overview



The rail corridor and configuration of the platforms in the downtown tunnel is based on the most efficient design to traverse the core. A centre platform, with an east and west bound LRT track on either side can be effectively and economically constructed as the tunnel boring machine

(TBM) works its way through the limestone bedrock under the downtown area. The centre platform avoids duplication of stairways, escalators and elevators, thereby saving costs. This configuration also minimizes entrance and wayfinding requirements associated with other platform types. Supporting infrastructure and equipment needs are minimized and the platform creates a safer environment since there is a higher likelihood of multiple passengers at any given time and it is easier to secure the area in case of an emergency.

The number and placement of stations in the downtown is based on existing and future population and employment densities. Local transit routes, major trip producers, existing internal building connections and adequate coverage of the core were also considered. Using a 300-metre circle as a proxy for a five-minute walk, and a 500-metre circle for a 7.5-minute walk, the spacing of the stations was optimized. Two stations are located between Bronson Avenue and Elgin Street and another at Rideau Station. Each of the stations will have a minimum of two public entries, providing good coverage across the downtown. Given the competing demands for limited available space within public road rights-of-way downtown, it is envisaged that station entrances would be co-located within new or existing development sites in order to maintain existing pedestrian space at-grade, and reduce utility relocations. At this point, station designs show a mixture of access from public and private lands to demonstrate what is possible at each station location. These should not be considered definitive, as the final locations for station entrances will be determined during subsequent phases of design, based on interest from adjacent landowners. In some cases, additional station entrances not shown on the plans could be considered where multiple developers are interested in hosting and funding direct access into a station. Depending on the location, station entrances located within a public road right-of-way may require closure of existing traffic lanes in order to provide sufficient width for the station entrance and maintain adequate sidewalk width. Utility relocations are limited to localized areas such as tunnel entrances from the surface and ventilation shafts.

The tunnel's "cross-country" alignment is as follows:

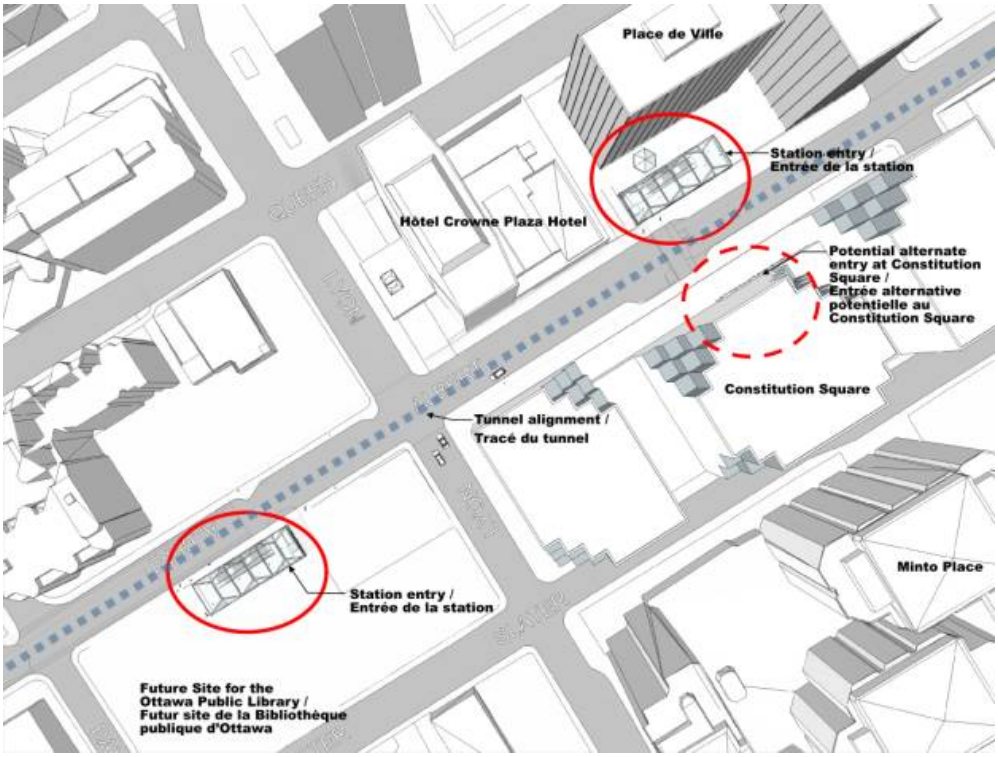
- Under Albert Street, with the Downtown West station in the Lyon/Bay block;
- Turning slightly to the north at Bank Street to cross under Queen Street at O'Connor, with the Downtown East Station centered between Bank Street and O'Connor; then
- Continuing cross-country toward Rideau Street, with a Rideau Station spanning under the Canal and Rideau Street; then
- Sweeping to the south under Rideau, Waller and Nicholas to connect to Campus Station;
- The tunnel continues toward the portal located south of Mann Avenue and north of Lees Station.

This alignment is the most direct and cost efficient route for the tunnel. The alignment can be constructed easily, and will have low on-going maintenance costs as the curvature of the track is optimized. It services a large percentage of the existing and potential development in the downtown, and is technically the most feasible given geotechnical conditions and construction considerations.

Four underground stations have been designed:

- **Downtown West Station** is proposed to be located under Albert Street, east of Bay Street, allowing integration with future Central Public Library building and serves existing development in west end of downtown. An entrance into Place de Ville or Constitution Square is also proposed.
- The recommended design follows the approved "Centre Platform" design alternative, and incorporates:
    - 180-metre long centre platform, to accommodate four-car trains initially and six-car trains in the future;
    - Two access points from ground level:
        - South side of Albert between Bay and Lyon (integrated into future Central Public Library site);
        - North side of Albert between Lyon and Kent (integrated into Place de Ville office complex, or within public right-of-way at existing Kent Transitway station);
    - Elevators, escalators and stairs will be provided at each access point;
    - An underground connection to the Constitution Square office complex or the proposed development at the northwest corner of Albert and Lyon (existing surface parking lot) could be constructed in the future, by others;
    - Underground connections to other adjacent residential, office and retail development sites could also be provided by others.

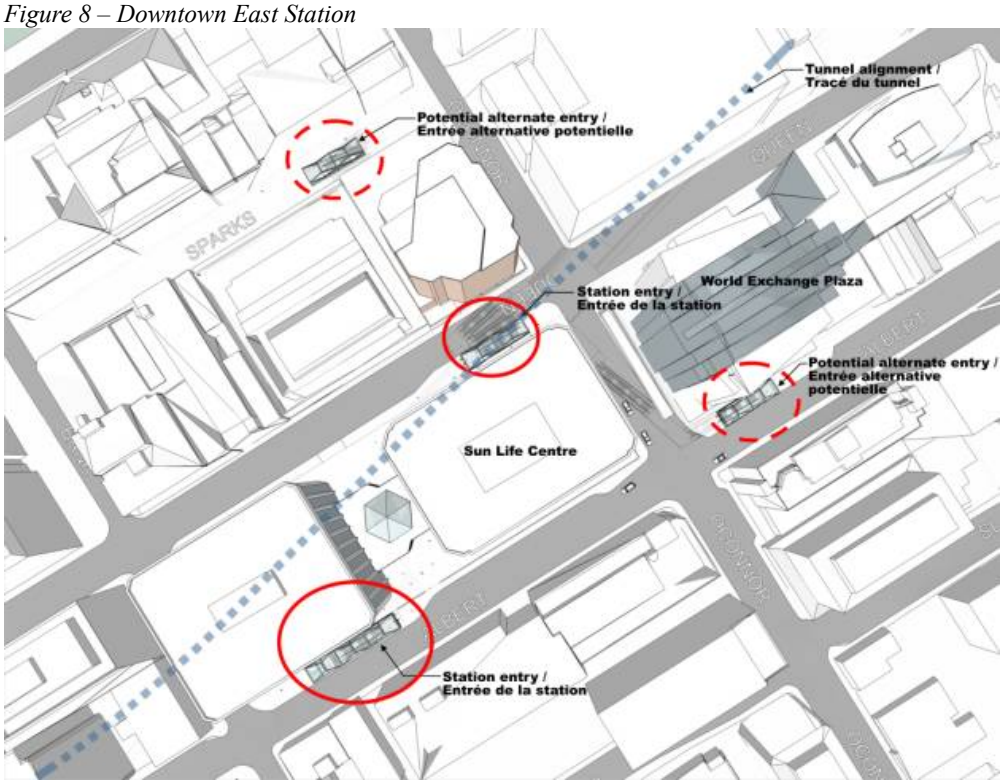
Figure 7 – Downtown West Station



- **Downtown East Station** is proposed to be located north of Albert Street, between Bank Street and O'Connor Street, to provide connections to local bus services on Bank Street and serves existing development in central and east parts of downtown.

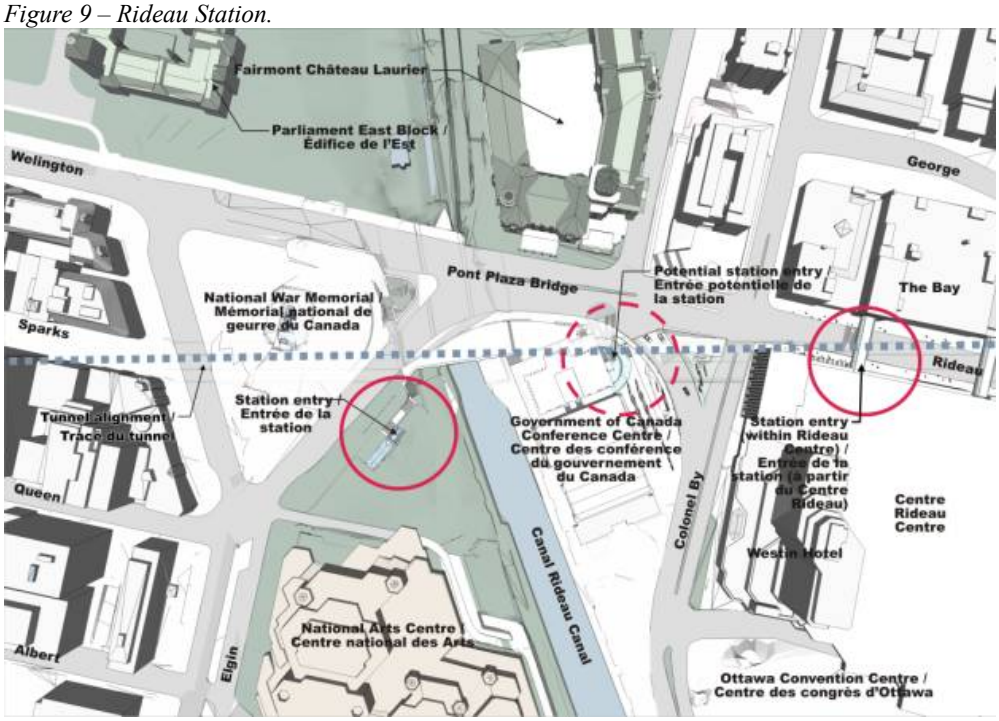
- The recommended design follows the approved "Centre Platform" design alternative, and incorporates:
  - 180-metre long centre platform, to accommodate four-car trains initially and six-car trains in the future;
  - Two access points from ground level:
    - North side of Albert Street, east of Bank Street (integrated into adjacent development or within the public right-of-way at the existing Bank Transitway station);
    - South side of Queen Street at O'Connor Street (integrated into adjacent development or within the public right-of-way);
  - Elevators, escalators and stairs will be provided at each access point;
  - An underground connection to the World Exchange office complex, Sparks Street and other adjacent developments could be constructed by others in the future.

Figure 8 – Downtown East Station



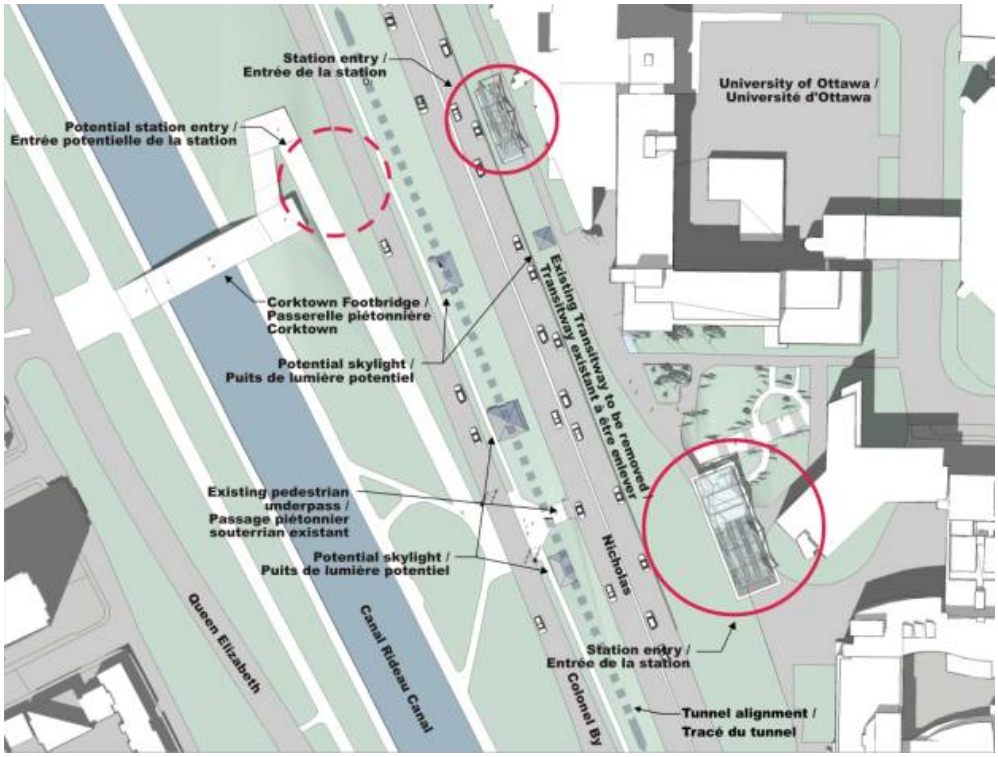
- **Rideau Station** is proposed to be located south of Wellington Street, between Confederation Square and Sussex Drive and has been designed to provide connections to both the west and east sides of Rideau Canal. The design allows for potential integration with the Government Conference Centre and the National Capital Commission commemorative design initiative for the Rideau/Sussex intersection. Connections for local (OC Transpo) and regional (STO) buses are also provided.
- The recommended design follows the approved "Centre Platform" design alternative, and incorporates:
  - 180-metre long centre platform, to accommodate four-car trains initially and six-car trains in the future;
  - Two access points from ground level:
    - East side of the Plaza Bridge (west of the canal and north of the National Arts Centre);
    - East of Sussex Drive (integrated into the Rideau Centre and The Bay buildings);
  - Elevators, escalators and stairs will be provided at each access point;
  - A potential access point along the east side of the Government Conference Centre (former Union Station) building could be constructed by others in the future.

Figure 9 – Rideau Station.



- **Campus Station** is proposed to be located approximately where the existing Campus Station sits today, and will provide connections to the University of Ottawa, Sandy Hill and Golden Triangle (via the Corktown Footbridge). The station alignment has changed since the May 2009 report. The station has been moved to the west side of Nicholas to improve constructability and reduce the impact that construction will have on local traffic and Transitway bus service (refer to Document 1). The NCC is currently reviewing this new alignment and further consultation with the Commission is required during the implementation/approval process.
- The recommended design generally follows the approved "South Portal, Underground Station" design alternative, and incorporates:
  - 180-metre long centre platform, to accommodate four-car trains initially and six-car trains in the future;
  - Two access points from ground level:
    - North end of the station, adjacent to Vanier Hall;
    - At the existing pedestrian underpass of Nicholas Street;
  - Elevators, escalators and stairs will be provided at each access point;
  - A potential underground connection into the new Vanier Hall building could be constructed in the future, by others.

Figure 10 – Campus Station



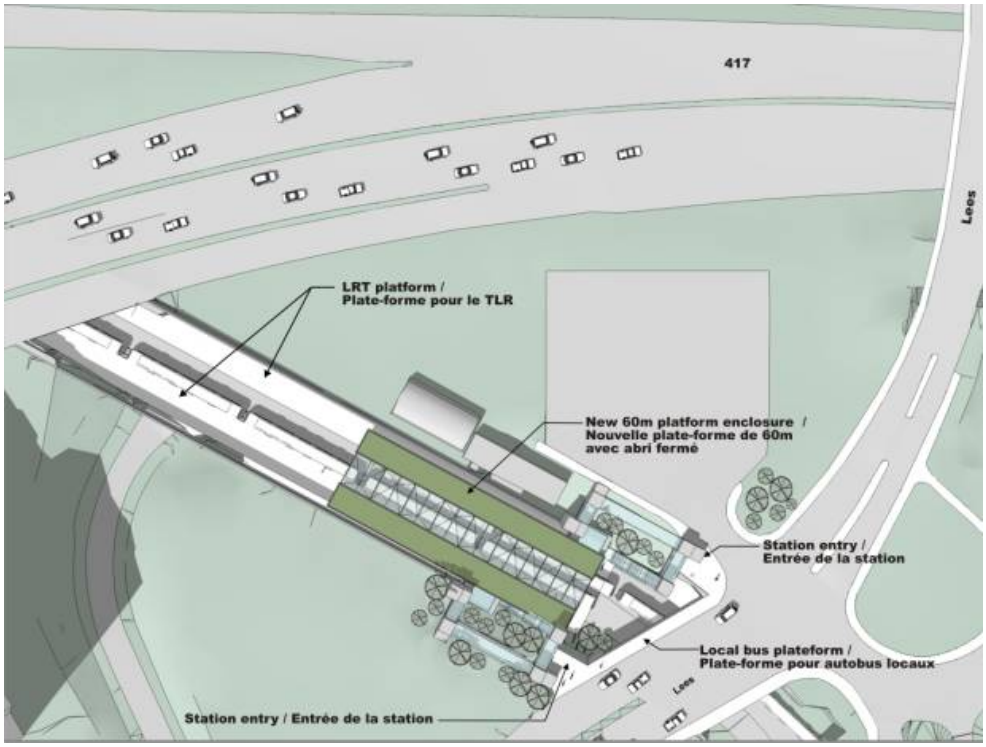
This report recommends that staff be directed to undertake an urban design study and a transportation study for the downtown for post DOTT implementation. Due to the re-purposing of Albert and Slater Streets and the impact of reduced bus traffic through the core area, it is appropriate that these studies be undertaken to determine the aesthetics and operational aspects of downtown streets, the ability to accommodate cycling lanes and improve pedestrian circulation and safety. Similarly, the streetscape component of the core area should be examined in the context of new opportunities due to the changes that will occur in traffic patterns and the geometric alignment of streets, particularly Albert and Slater Streets.

Lees Station

Lees Station serves adjacent residential development to the south and east of the station area, as well as the southern part of the Sandy Hill community. The station has the potential to be integrated into redevelopment of adjacent lands as envisaged in the Nicholas-Mann Gateway Precinct Design Plan, and also future redevelopment of University of Ottawa lands to the south. An important existing pedestrian link between Lees Avenue and the main University of Ottawa campus will also be maintained.

Following the approved design option for this segment of the alignment, Lees Station will remain in its current location and generation configuration, with upgrades to existing station facilities incorporated as part of conversion to LRT. This includes provision of 120-metre long LRT platforms, with protection allowed for future extension to provide 180-metre long platforms. The existing platform canopies will be removed and replaced with a new fully enclosed platform canopy spanning over the LRT tracks. Due to the lower use nature of this station, the platform canopy may not extend for the full length of the LRT platforms. Existing station access points from Lees Avenue will be maintained.

Figure 11 – Lees Station



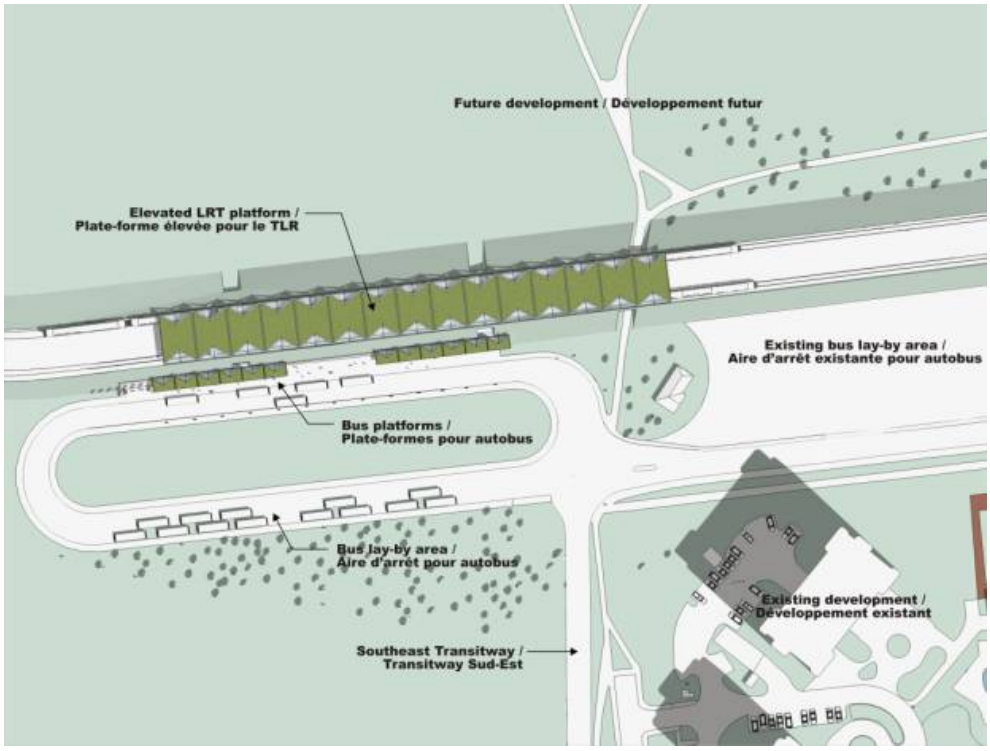
Hurdman Station

Hurdman Station will be a major transfer point between the DOTT and the existing Southeast Transitway as well as local bus services. There is a significant opportunity to integrate the station with future development lands to the north owned by the NCC, with access provided to these lands via an extension of Industrial Drive, passing under the DOTT corridor to the east of the station. Important pedestrian and cycling linkages around the station area will be maintained to provide connections to/from and through the station area.

The recommended design for Hurdman Station follows the approved "Horizontal Transfer – Further North" design option. This will allow continued bus operation to continue to serve the existing station platforms through most of the construction period. This option places the LRT platforms on a raised embankment north of the existing station, and reconfigures the bus loop as a one-sided platform parallel to the LRT, in an arrangement similar to Billings Bridge Station. Underpass structures will provide access from the BRT platforms to the raised LRT platforms, and also provide through connections to the development lands and pathways north of the station. 120-metre LRT platforms in a centre-platform configuration, expandable to 180-metre long LRT platforms to accommodate six-car trains in the future will be provided. A pocket track will be provided to the east of the station to provide operational flexibility for LRT service. After construction, the existing centre-island bus platform will be demolished, with the space converted to provide bus lay-up and turn-around facilities. The existing bus lay-up space to the east of the station could be re-purposed for other uses, such as an enhanced drop-off facility.

The NCC intends to develop lands to the north of Hurdman Station and therefore an appropriate access to the site is required. This will be achieved by extending the elevated LRT alignment further east, to pass over an extended Industrial Avenue, which will serve the development parcel in the future. This elevated alignment will meet the existing Transitway alignment and grade east of Hurdman Station and pass over Riverside Drive via the existing Transitway overpass.

Figure 12 – Hurdman Station

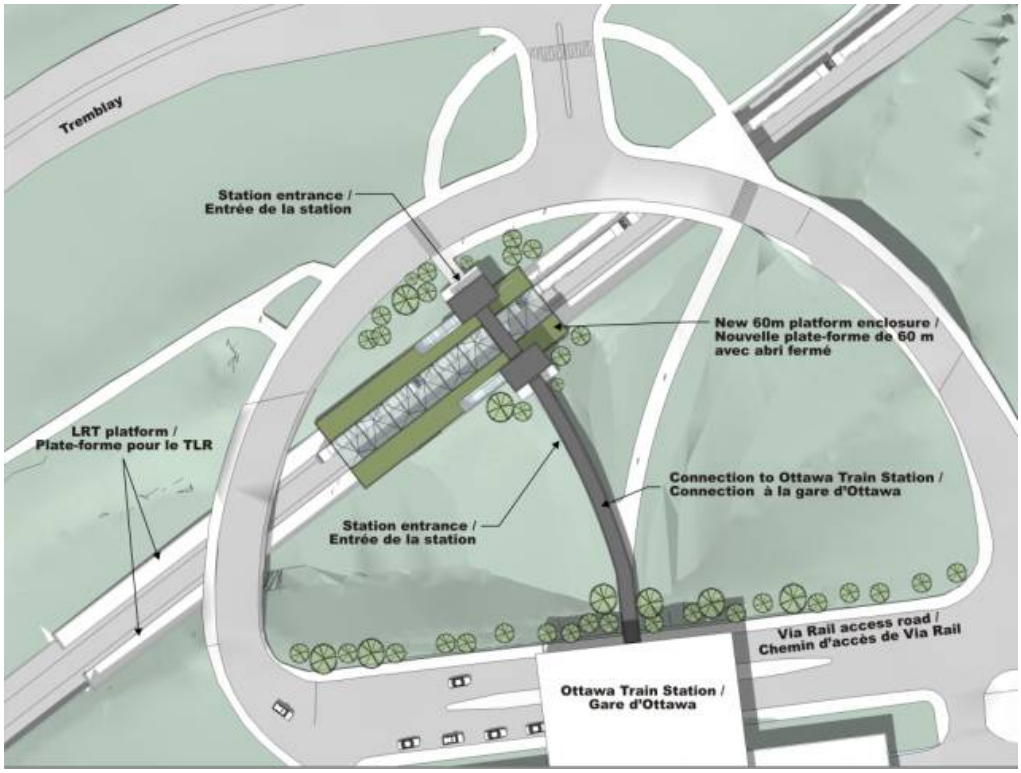


Train Station

Train Station provides important connections to intercity (VIA) passenger rail service and to potential commuter rail service. Access to adjacent employment lands to the east is also provided, and potential integration with a planned Queensway pedestrian overpass can be provided, allowing for access to development on the north side of the Queensway (Baseball Stadium, Overbrook community). Existing pedestrian and cycling connections to the east and west would be maintained.

The recommended design for Train Station follows the approved "Diagonal" design option. This option eliminates the existing sharp curves east of the station, which are not suitable for LRT operation and straightens the alignment in front of the station. The existing BRT platforms, Tremblay Road and east station driveway overpass structures would be demolished, with new LRT platforms and overpass structures built along the new alignment. The existing west station driveway can be maintained, which will allow access into the VIA rail station to be maintained during construction. 120-metre LRT platforms in a side-platform configuration, expandable to 180-metre long LRT platforms to accommodate six-car trains in the future would be provided. One access point located approximately at the mid-point of the LRT platforms would be provided, linking the LRT station with the VIA rail station and Tremblay Road via a covered walkway. It is proposed that the existing pedestrian bridge spanning the Transitway be relocated and re-used to span the LRT tracks at the access point. Others could construct a future connection from the east end of the LRT platforms. Elevators, escalators and stairs would provide access between ground level and the LRT platforms, located within the existing "bowl" in front of the VIA rail station.

Figure 13 - Train

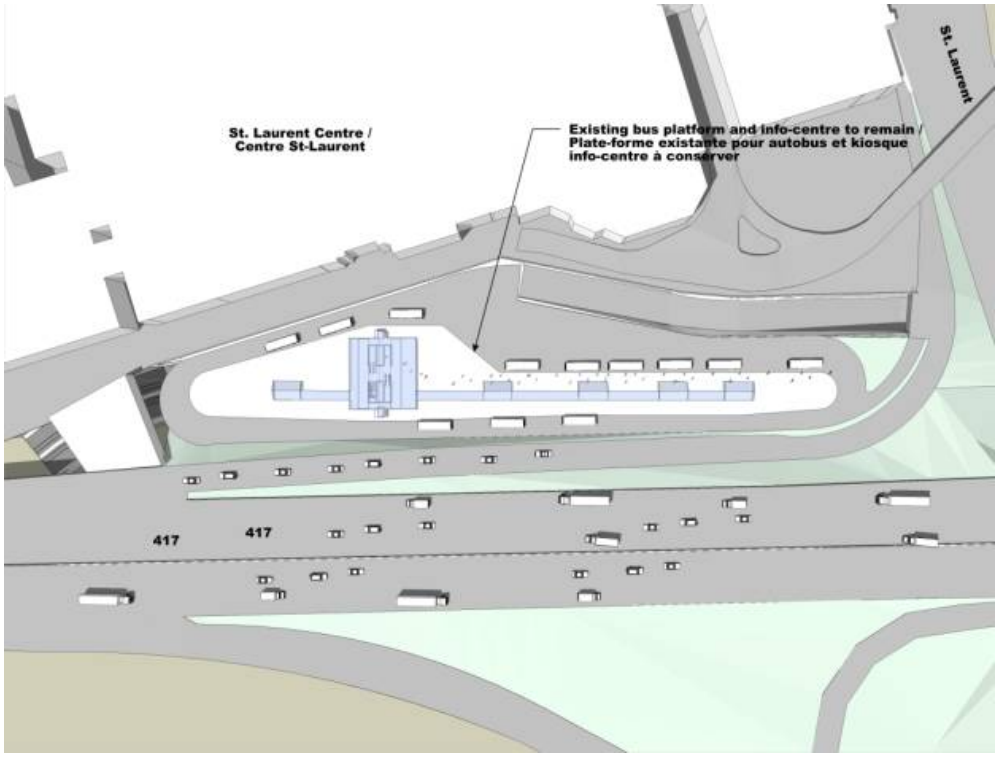


St. Laurent Station

St. Laurent Station serves an established major retail development (St. Laurent Shopping Centre) and provides for transfers to local bus services via an upper level bus terminal. The adjacent shopping centre has submitted plans for a major expansion, which will further support transit ridership. Additionally, PWGSC is preparing development plans for a major employment node located on lands adjacent to the station site, south of The Queensway. There is the potential for a direct pedestrian connection from these lands into St. Laurent Station.

Following the approved design option for this segment of the alignment, St. Laurent Station will remain in its current location and general configuration, with upgrades to existing station facilities incorporated as part of conversion to LRT. This includes provision of 120-metre long LRT platforms on the existing lower level of the station, with protection allowed for future extension to provide 180-metre long platforms. The upper level bus platforms would remain largely unchanged and continue to serve local bus services providing connections to the LRT line. Existing station access points will be maintained, with the potential for a connection to future development lands south of the Queensway (to be built by others).

Figure 14 – St. Laurent Station

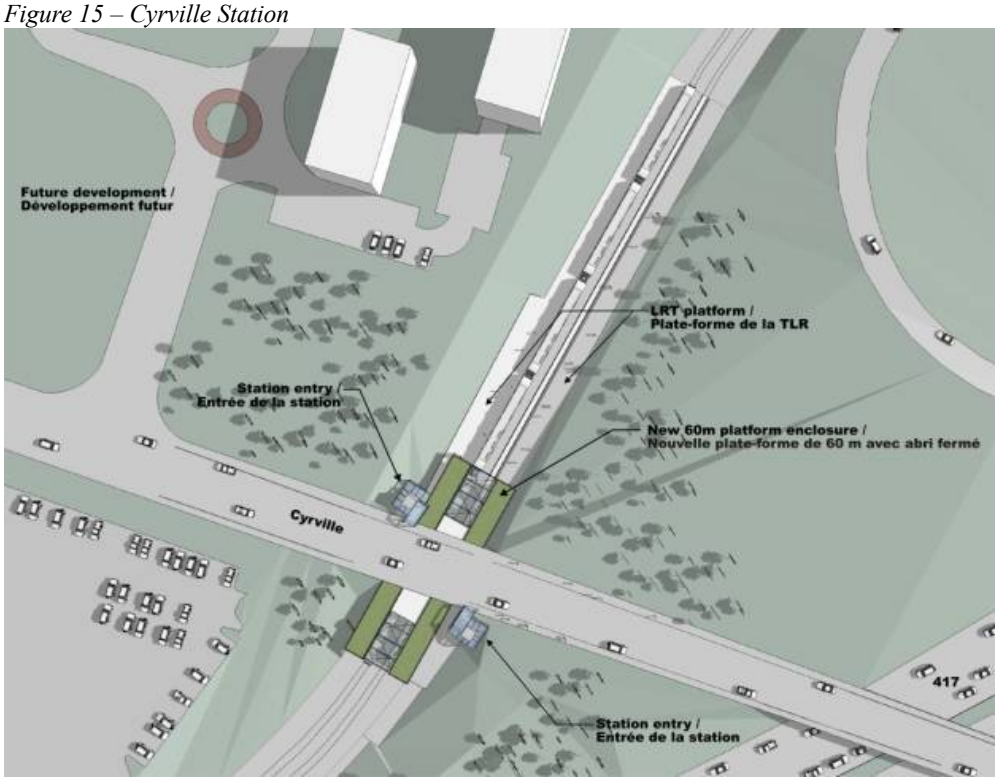


Cyrville Station

Cyrville Station serves adjacent residential development to the north of the station area, as well as employment uses to the west and south. Build-out of planned residential development to the north (Place des Goveneurs) will support transit ridership at this location. The station design and alignment is also compatible with proposed plans to upgrade the highway interchange as a result of the Interprovincial Bridge Crossing Study (as presented to date).

Following the approved design option for this segment of the alignment, Cyrville Station will remain in its current location and generation configuration, with upgrades to existing station facilities incorporated as part of conversion to LRT. This includes provision of 120-metre long LRT platforms, with protection allowed for future extension to provide 180-metre long platforms. The existing platform canopies will be removed and replaced with a new fully enclosed platform canopy spanning over the LRT tracks. Due to the lower use nature of this station, the platform canopy may not extend for the full length of the LRT platforms. Existing station access points from Cyrville Road and an office development to the west will be maintained.

Figure 15 – Cyrville Station

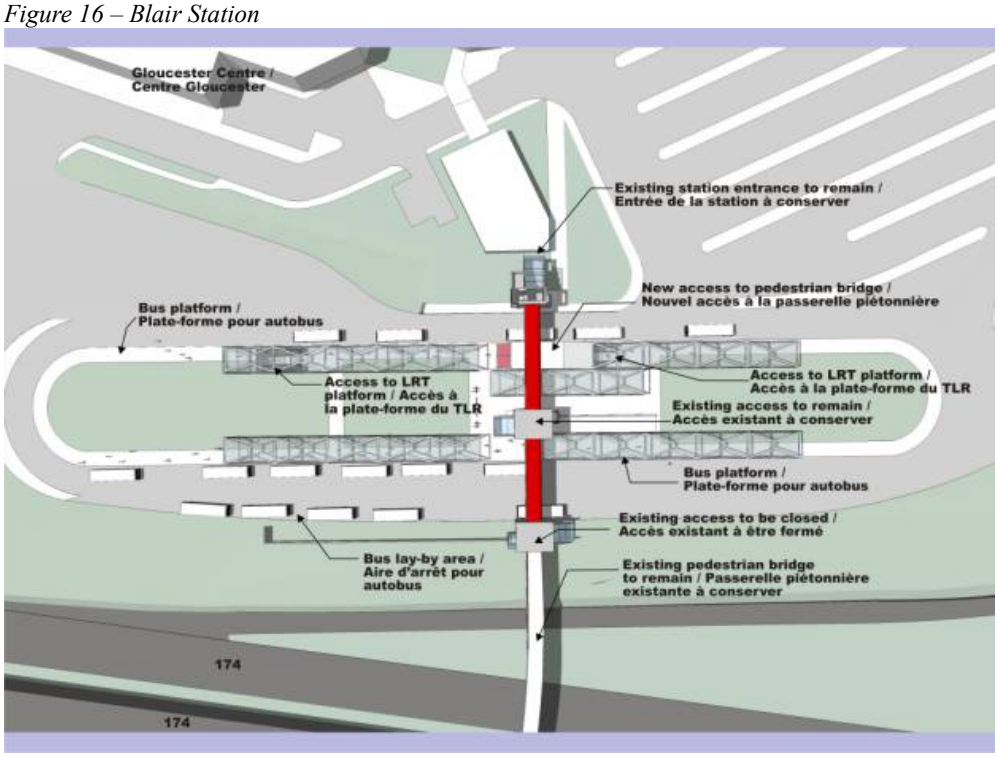


Blair Station

Blair Station will serve as the eastern terminus of the DOTT and accommodate transfers from BRT service from the east (existing East Transitway and future Cumberland Transitway) and local bus services. The station also serves a major retail development (Gloucester Centre) located immediately adjacent to the station site, as well as office developments to the east and south (linked via a pedestrian bridge over OR 174).

The recommended design for Blair Station follows the approved "LRT on Lower Level" design option. This option converts the existing local bus platforms on the lower level of the station to 180-metre long LRT platforms, in a centre platform configuration, to accommodate four-car trains initially and six-car trains in the future. An expanded upper level bus platform in a centre-island configuration would accommodate BRT and local bus service, with vertical transfers achieved directly from the upper (bus) to lower (LRT) levels. The existing pedestrian overpass, which spans over the station and connects the Gloucester Centre to development lands on the south side of OR 174, would be rehabilitated and re-used. Existing station access points into the station would be maintained. A cross-over track would be provided to the west of the LRT platforms to allow trains to reverse direction. A pocket track, also to the west of the station would be provided to store out of service trains and provide operational flexibility.

Figure 16 – Blair Station



Maintenance and Storage Facility

The LRT Maintenance and Storage Facility is included within the scope of DOTT Planning and Environmental Assessment Study and is an integral part of the project, as it will:

- House and service all of the trains needed to operate the line;
- Service vehicles to be used on future LRT lines;
- House the operations control centre (signalling, communications) for the line; and,
- Be the primary heavy maintenance facility for the LRT network.

Ten potential sites were examined based on the four evaluation factors developed for the facility, namely:

- Site Characteristics (topography, grade, land use compatibility, expansion capability and environmental considerations);
- Facility Operations (turnaround loops, track redundancy, layout efficiency and municipal services);
- System Operations (connectivity to the line, efficiency and access to freight rail); and,
- Relative Costs (capital, operating, maintenance and property ownership and acquisition).

Evaluation of the 10 candidate sites was presented at DOTT Public Open House #2 on 24 June 2009. Based on the evaluation, three sites were short-listed for additional evaluation:

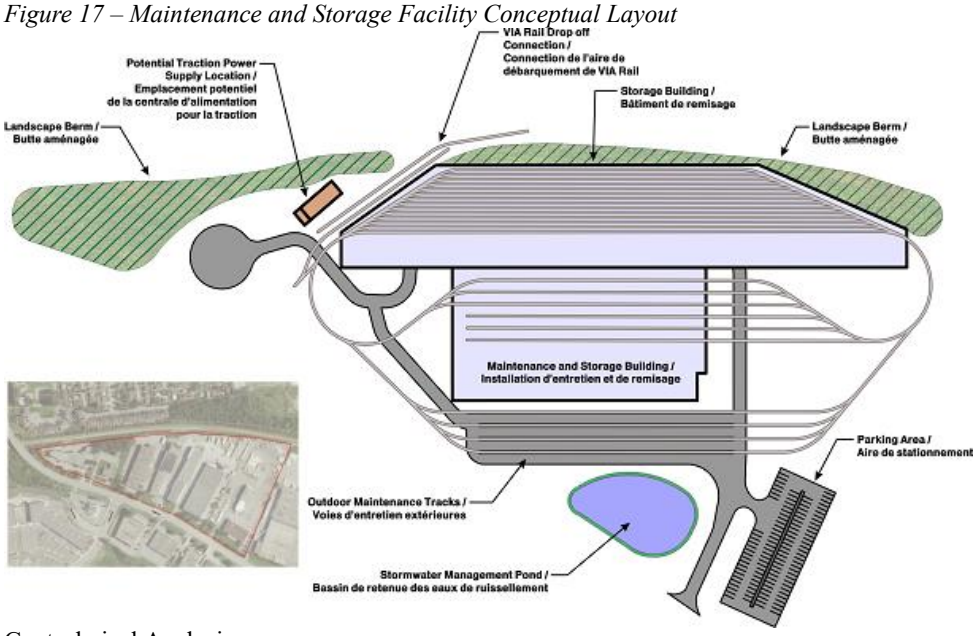
- Bayview;
- Hurdman North;
- St. Laurent.

Based on feedback from the Consultation Groups and the public, additional evaluation was undertaken, focussing on the land use and development impacts of the three sites. While these factors had been considered in the initial evaluation, the number of technical considerations overshadowed these impacts. As the three short-listed sites were all capable of supporting the facility from a technical perspective, the focus on land use and development was deemed the primary differentiator. As a result of this additional analysis the St. Laurent site is recommended as the preferred site based primarily on:

- Land use;
- Ownership;
- Expansion capability;
- Access and connectivity to Transitway.

Document 1 describes the location and the recommended plan for the Maintenance and Storage Facility. This facility needs to be constructed and ready to accept vehicles, in advance of the revenue service, for the commissioning of the line.

Figure 17 – Maintenance and Storage Facility Conceptual Layout



Geotechnical Analysis

A geotechnical study was carried out in support of the planning and functional design phase of this project. Published information and maps from the Geological Service of Canada and the Ontario Geological Service, as well as subsurface information from the geotechnical consultant's (Golder Associates) files, were used as the basis for that geotechnical study.

The results of the study indicate that most of the route downtown is underlain by shallow bedrock, likely at depths ranging from about two metres to five metres below existing ground surface between the west portal and Rideau Centre area. In the vicinity of the Rideau Centre, a valley in the rock is known to exist, where the surface of the bedrock is indicated to be locally much deeper. South of Laurier Avenue, the bedrock becomes progressively deeper, extending to depths ranging from about five metres to possibly 25 metres below existing ground surface, and changes from limestone to shale of the Carlsbad formation. The subsurface conditions from about Waller Street to Mann Avenue likely consist of sensitive silty clay overlying deposits of glacial till and sand, and south of Mann Avenue the subsurface conditions are indicated to consist of significant deposits of sands underlain by glacial till. Both of these areas will have substantial groundwater issues. In addition, the published information indicates that at least three faults cross the tunnel alignment in the downtown core. Additional faults and associated tributary faults likely also lie within the study area. These faults are now considered inactive but create important features likely to impact the overall bedrock quality and hydrogeological regime.

A sample of rock from a local quarry was sent to a laboratory for testing to confirm some of the parameters used for design. While generally useful, this sample only provided guidance in setting parameters.

The results of the geotechnical study have been used to inform the functional design of the tunnel and downtown stations. Based on the results of preliminary rock modelling using the data available, the vertical alignment of the tunnel has been lowered to provide additional clearance from structures above. The position of Rideau Station has also been shifted further to the west in order to be located outside of the rock valley area.

In order to advance the design of the tunnel and underground stations, additional analysis of rock conditions is required to support the next phase of project design. This work would include drilling boreholes and undertaking more detailed testing and analysis of geotechnical and hydro-geological conditions.

Construction Staging

While the final construction staging plan for the DOTT project will be the responsibility of the implementation team and the contractor selected to construct the system, the DOTT functional design process did look at the general objectives of the staging and opportunities to provide logical break points between sections and phases of work. Estimated durations were also compiled to allow for schematic planning of the implementation process. At the most general level, the project will be staged to:

- Minimize construction cost;
- Minimize traffic and bus service disruption;
- Optimize cash flow; and,
- Maximize contractor efficiency.

The staging will also follow these general principles:

- The tunnel and underground stations will likely start first, as these elements will take the longest to construct;
- The Maintenance and Storage Facility must be completed midway through the construction of the project to allow for delivery of vehicles and vehicle testing;
- Major work at Bayview, Hurdman and Blair is off the existing Transitway and can be done with minimal disruption to bus service;
- Conversion of the Transitway will be done in logical segments to maintain bus service on the Transitway for as long as possible;
- Once construction starts in an area, bus service will be rerouted, and will not return; and,
- After construction is complete there will be a period for station fit-out, testing and commissioning before revenue service starts.

In addition to the general principles, the following assumptions were made to determine construction staging opportunities, estimate duration and estimate capital cost for the tunnelled portion of the project:

- The twin tunnels will be constructed using a Tunnel Boring Machine (TBM), likely an Earth Pressure Balance machine, which will allow the tunnel work to proceed from end to end through the varying ground conditions that are known to exist;
- The tunnels will be staged from LeBreton Flats to take advantage of vacant land;
- The depth of the tunnel (approximately 30 to 35 metres below grade) has been planned to avoid impacts to building foundations, utilities and the Rideau Canal;
- Cut and cover construction will generally be limited to the areas around the west and east tunnel portals;
- There will be some visible cut and cover construction work at each station to construct the entrances and vent shafts (some locations which are not under the travel lanes, or which can be closed off may be constructed using open excavations, where local conditions permit);
- Downtown stations will be mined out from within the tunnels, and all of the excavated material will be hauled out to the LeBreton work site; and,
- Campus Station will be constructed using the traditional open excavation method.

The bulk of the visible activity will be at the TBM launch site, which will be at the east end of the LeBreton Flats, although there will be substantial activity at Campus Station and the East Portal (south of Mann Avenue). Appropriate mitigation measures to reduce noise level impacts during construction will be considered during the EA phase of the study, with detailed plans developed by the contractor responsible for actually constructing the tunnel. The City will have input into specific measures adopted (e.g. working hours, truck routes, dust control).

The following assumptions were made to determine construction staging opportunities, estimate duration and estimate capital cost for the conversion of Transitway Stations:

- Platforms will be widened with the tracks being placed in centre by-pass lanes;
- Existing canopies and shelters will be removed;
- Elevators will be upgraded; and,
- New canopies will be installed over the platforms and track for the full length of the station (except at a few low-use stations).

The stations at Bayview, LeBreton, Hurdman, Train and Blair require extensive modifications to accommodate conversion and must be largely rebuilt to accommodate the new LRT system and the transfer of passengers to bus and Transitway services.

The following assumptions were made to determine construction staging opportunities, estimate duration and estimate capital cost for the conversion of the Transitway running segments (between the stations):

- In open areas, ballast and track will be installed on top of the existing roadway;
- Track through the stations will be directly fixed to a concrete slab for ease of maintenance;
- Minor changes to drainage will be required; and,
- Some structures will require modifications to increase vertical clearances.

An operating plan for the line was required to develop the functional plan. The following assumptions were used to develop the physical requirements for rail operations:

- Track, power and systems installation at the Maintenance and Storage Facility will be completed before the vehicles arrive;
- Testing in the yard and sections of the line close to the Maintenance and Storage;

- Facility construction will begin as soon as possible;
- Each section of track that is completed will require a testing and commissioning period;
- Crossovers will be provided at the terminus stations and at key points along the line to allow trains to reverse direction;
- Pocket tracks will be provided at Hurdman and Blair Stations;
- Two storage tracks will be provided at Tunney's Pasture to accommodate out of service or disabled trains; and
- The connection to the Maintenance and Storage facility will allow trains to enter/leave the line from both directions.

High-level project scheduling indicates that it could take up to seven years for construction and commissioning of the LRT line. This duration estimate is subject to refinement through design and the procurement process. A report will be forwarded to Council to outline the implementation/construction of the project when a procurement method is established.

Bus Operations During and After Construction were also a major consideration in the development of the functional plan, although the actual bus operating plans will need further review during the detailed planning of the station and the bus network that is put in place after construction will need to reflect the ridership patterns in place at that time. However, there are several assumptions that were made to determine the impact of construction on bus services and to size the bus transfer facilities included in the functional plan. The DOTT project assumed that various segments of the Transitway will be out of service as construction proceeds, during which alternative arrangements will be needed, including:

- Use of the shoulder or outside lane of the Queensway;
- Dedication of traffic lanes to transit usage along some streets;
- Implementation of traffic signal priority along key routes;
- Minor reconfiguration of intersections and interchanges, to give buses priority;
- Potential major reconfiguration of the Nicholas interchange and access to Lees Avenue to reduce impacts on vehicular circulation and to prioritize bus movements to and from the core area via Nicholas;
- Several alternate routes will be required, likely including:
  - Innes, Industrial, Ogilvie, Coventry, Tremblay, Riverside and the Queensway in the east;
  - The Queensway, Carling, Scott/Albert and the Ottawa River Parkway in the west;
- Bus routes may be segregated into local and express services and assigned to different routes to minimize local impacts.

Transit Services also undertook a strategic plan (conceptual plan) for bus connections with the rail line for the areas around the Rideau Centre, at downtown rail stations, Tunney's Pasture, Hurdman, St. Laurent, and Blair. This is detailed in a separate report (IPD – Strategic Plan for Bus Route Connections with Rail Line. Ref: ACS2009-ICS-TRA-0013).

During the detailed design phase, the final detour plans will be closely co-ordinated with construction staging. These plans may include temporary station facilities to provide good connectivity to local routes and major trip origins and destinations, for instance if buses serving St. Laurent Station are by-passing the existing station, expanded bus bays may be required on St. Laurent to facilitate transfers.

At the end of the construction period, there will be substantial changes to the existing BRT and local bus routes to provide connections with the new LRT line, reflect the new operating philosophy, respond to ridership growth and changes in ridership patterns and meet the operating budget requirements in place at the time.

Figure 18(a) – Bus Diversion Routes

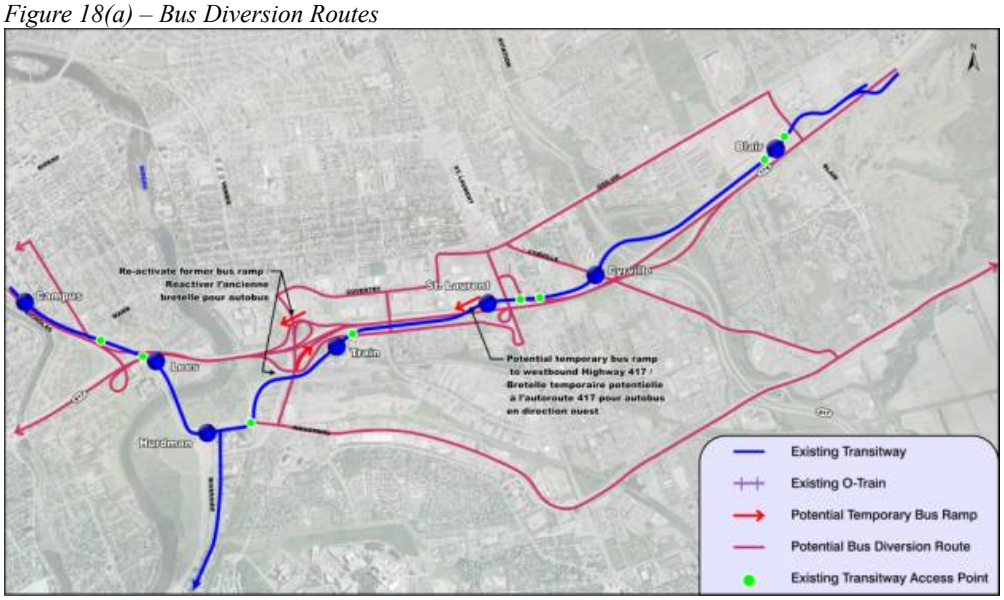
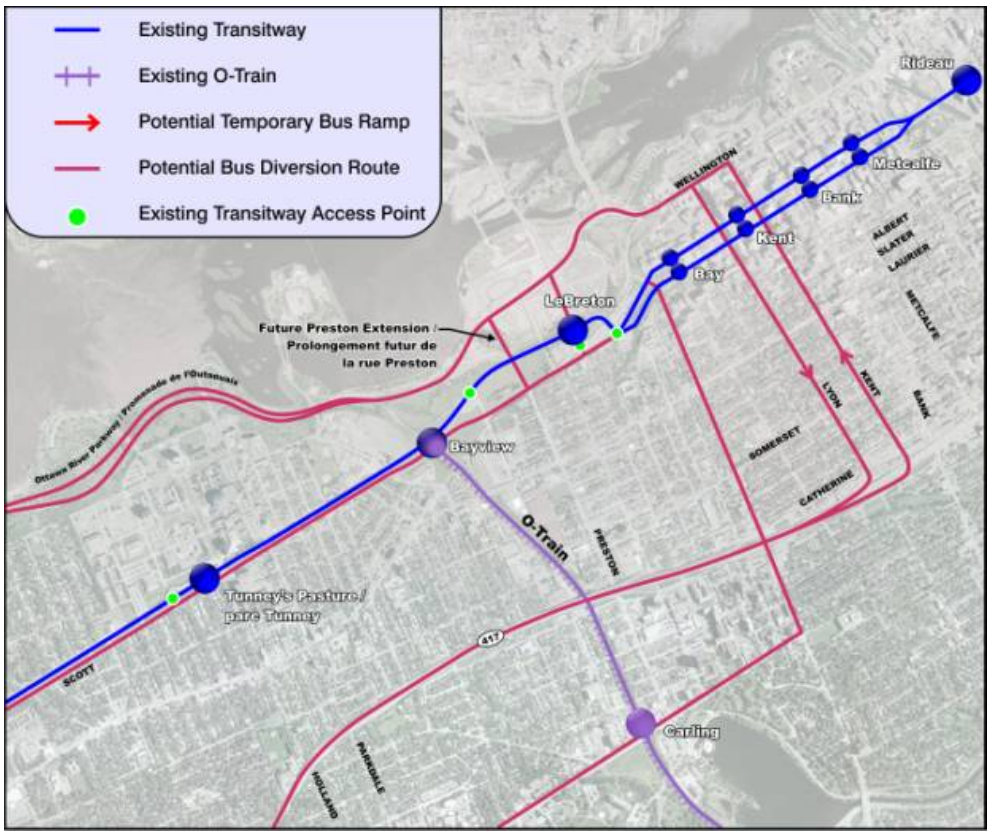


Figure 18(b) – Bus Diversion Routes



Property Requirements

The functional design exercise has determined the land requirements based on the alignment for the Recommended Plan. Lands in both the private and public domain are required. Real Estate Services has established that 130 properties are needed for this project, as follows.

- 50 owned by the City of Ottawa;
- 50 owned by the federal government and agencies, and the National Capital Commission (NCC.), including approximately;
    - 30 owned by the NCC
    - 15 owned by Public Works
    - 5 owned by federal agencies
- 10 owned by the provincial government and agencies;
- 20 owned by private owners, including approximately;
    - 15 with subterranean rights
    - 5 with surface rights

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. This is particularly important for the alignment west and east of the tunnel. The tunnel requirements for lands will focus on the downtown core requirements for property, easements, subterranean rights and staging areas.

Business Case

The Business Case document is not part of the functional planning or environmental assessment requirements, but is intended to fulfill the information requirements of senior levels of government associated with funding major transit projects. The content consists of a detailed project description, a statement of the project's benefits including an analysis of the project's measurable results, and a series of specific information items relative to government priorities.

With a Recommended Plan defined, the business case for the Ottawa DOTT is now actively underway. The analysis of the project's results is being conducted using a Multiple Account Evaluation framework, which has allowed other project benefits to be calculated. The ridership is being refined and transportation impact information is being developed at time of writing and will be added to the business case. This analysis is expected to be completed by end of January 2010 and will be forwarded to Council for information.

Public Art

Public art is an important component of the project and will be accommodated within station and runningway elements of the system. The City of Ottawa has a policy requiring that an amount equal to one per cent of an infrastructure project’s hard costs be dedicated to the provision of public art. An allowance of $10 million has therefore been included in project costing for public art. In addition to the provision

of stand-alone pieces of artwork throughout the system, public art could also be integrated into the architectural elements of stations and runningways. Existing public art along the Transitway will be maintained wherever possible.

A public art program geared specifically for this project will be developed by the City and include input from a number of groups including the NCC, Algonquins of Ontario, local arts interest groups and the community at large.

Next Steps – Overview

The approval of the Recommended Plan outlined in Document 1 and the recommendations presented for approval in this report will lead to a number of activities over the next several months. A critical path has been provided to Council and will be updated from time-to-time, as milestones are set. While the DOTT EA (Provincial process) is expected to be approved by the Minister in May 2010, the Federal EA process, which requires more design details, will continue and is expected to be complete in early 2011.

An overview of the next steps in the roll-out of this project, leading to contract award is as follows:

Planning and EA:
13 January 2010 - Recommended Plan (functional design) to Council for approval
January/February 2010 - Notice of EA Commencement, including final consultation
Early March 2010 - Notice of EA Completion, EPR available for public review
Early April 2010 - Deadline for public comments on the EPR
Early May 2010 - Ministry of Environment Decision on the DOTT EA

It is importation to note that the City has undertaken an update of the risk assessment of the TMP as it relates to the DOTT project and also worked with Infrastructure Ontario to assess the merits of an alternate financing procurement (AFP) method. Analysis of the assessment is underway and will be the subject of a report on procurement of DOTT to Transit Committee and Council in the new year.

RURAL IMPLICATIONS

N/A

CONSULTATION

This study involved over 150 stakeholder groups, including community organizations, property owners and businesses within the study area, institutions, approval agencies and groups with a special interest in the study. In addition to the Agency, Business and Public Consultation Group meetings, three Public Open Houses and presentations were conducted in February, June and October 2009. More than 300 people attended in total. The City has received over 150 comments from the open houses which supplements approximately 100 comments on the project that have been received to-date in the form of written submissions or email from the project web-site.

Individual meetings were also arranged with groups such as the Downtown Coalition, Viking Rideau Corporation, the University of Ottawa, and the NCC. A project website (www.ottawa.ca/tunnel) was established along with a dedicated e-mail address (dott@ottawa.ca) to allow the public to contact the study team directly. Consultation efforts will continue as the study progresses through the EA stage.

A summary of consultation efforts undertaken to date is provided in Document 2.

Issues Arising From Consultations

National Capital Commission

The National Capital Commission (NCC) has a mandate and mission to build the Capital region into a source of pride and unity for Canadians. They play a key role in the project as they have land holdings at a number of stations, along the alignment and a special interest in the planning of the core area of the City. The NCC also grants applications for federal land use approvals.

A number of meetings have been held with the NCC to deal with real estate issues, land use and design, and other matters that fall within their mandate and require permits and approvals. These matters have been assessed in the context of this planning exercise and have been incorporated in the Recommended Plan. Further collaboration with the NCC is required to initiate the formal approval process and this will be achieved as the project moves forward with design.

Some key issues being dealt with include:

- Interim and ultimate bus operations and proposed BRT to LRT transfers areas;
- Proposed future modifications to interprovincial STO bus service routes on Ottawa side;
- Design principles and guidelines which have considered the capital perspective and National Symbols (Parliament, confederation boulevard, UNESCO site, etc);
- Transit-oriented land use design principles for stations located on future development lands;
- Ridership projections and future interprovincial transit considerations;
- Details on the federal land requirements (for both the NCC and other federal agencies and departments);

- Assessment of the effects of construction and implementation of LRT service on the environment, heritage/UNESCO Rideau Canal and proposed mitigation at federal sites in proximity to the national symbols, large commemorative sites and Parliament;
- Detailed information on the station design (dimensions, geometry, land requirements, etc) for stations where there is a capital interest; and,
- Business case (justification) for federal land use.

In addition, presentations to NCC's Advisory Committee of Planning Design and Property (ACPDR) requires regular presentations and updates related to:

- Design Principles;
- Integration of Transportation and Land Use;
- Details of Station layout and Storage and maintenance Facility;
- Urban Design and Landscape; and,
- A transit System for the people; and,
- Federal EA process.

Downtown Coalition

The Downtown Coalition sought a cross-country alternative that would move the alignment southerly under Albert Street before veering at Metcalfe Street towards Rideau Station. This matter has been discussed with the Coalition in detail and the recommended plan is now supported by the Coalition. It is now agreed that the recommended plan achieves the following:

- Less tunnelling due to a more direct route to the next station;
- Less costly due to a shorter route and less technically challenging boring strategy;
- Optimal walking distance to the station;
- Does not require an "S" curve to reach Rideau Station;
- Provides the potential for more access points to the surface;
- Avoids technically difficulties under and around buildings;
- Provides a smoother more comfortable ride through the core; and,
- Will require less maintenance on vehicles (wheels).

Rideau Station and Rideau Viking Corporation

The Viking Rideau Corporation indicated that the recommended plan would not be suitable for the operation and future growth of the shopping complex and its remaining development parcels since primary transit movements would be focused at the Rideau Street end only, rather than distributed between Rideau Street and Mackenzie King Bridge as currently exists. Transit Services has undertaken a review of bus and passenger routings in the area and summarized findings in a separate report (IPD – Strategic Plan for Bus Route Connections with Rail Line. Ref: ACS2009-ICS-TRA-0013). The report concludes that:

- Routings in the vicinity of the Rideau Centre can be modified to balance the interests of transit customers, operations staff and the Rideau Centre;
- Changes to the routings will help reallocate buses to the streets in downtown in a manner consistent with balancing service on available streets; and,
- Performance of the routes, both in terms of costs and passengers carries, will remain very similar to the current operations.

The recommended tunnel alignment at Rideau Station serves multiple purposes, including facilitating local transit connections with direct and indirect access to the By-Ward Market, Rideau Centre and retail on Rideau Street, the Ottawa Conference Centre and the National Arts Centre and Confederation Square.

This station location best suits the LRT alignment from a functional and operational perspective. Local and regional transit will be well served by the station as it will act as a hub for riders destined to this area of the downtown. The number of above-grade transfers and reduced travel time because of a more direct transition between local and regional traffic as well as the opportunity to transfer to local routes at other stations along the LRT network will make this a very active station.

Discussions with Rideau Viking have kept them apprised of the recommended plan and surface transit operations following the completion of the LRT project. The City will continue to work with Rideau Viking and review their proposal, when submitted for comment, to construct alternate access points at Rideau Centre.

Public Consultations

Extensive consultation has been undertaken throughout the study. The consultation effort is summarized in Document 2 – Summary of Public Consultations.

There is strong public support for this project. Major issues received from the public and special interest groups arising from the recent Public Open House #3 (26 October 2009) include:

Transit Link to Gatineau

The issue of a transit link to Gatineau from Ottawa, and specifically from Bayview, was raised. This DOTT project does not preclude the development of an interprovincial transit link or transfer at Bayview, nor any other option. The infrastructure required to integrate interprovincial transit services is the subject of the Interprovincial Core Area Rapid Transit Integration Strategic Planning Study (a joint study with the STO/Gatineau, the NCC (project lead) and the City of Ottawa). The interprovincial transit study addresses both short-term and long-term solutions (operational improvements/coordination, and possibly new infrastructure). Options from that study will be presented for public review in early 2010, with an anticipated report to Transit Committee by mid 2010.

Tunnel Depth and Access To Grade

There were concerns that the tunnel is too deep and comments concerning the accesses to/from the underground stations. This issue has been discussed at consultation meetings and again at the most recent open house. As stated earlier in this report the Recommended Plan includes two entrance points at each station (there are options for additional connections that can be provided by others). Stairs and escalators will be provided at each entrance. There will be back-up emergency power. The tunnels have to be at a depth that clears underground utilities and parking garages but more importantly it should be in solid bedrock to ease the construction effort, duration, and risks. The depth of the tunnel will be re-examined at the next phase of design, which will be supported by additional geotechnical investigations such as borehole testing. With the current plan, the estimated time to access the platform from street level varies depending on the station and the access point chosen. However, the few minutes that it takes to access the underground platform can be quickly offset by the reliability and frequency of a grade-separated LRT service with headways of approximately two minutes or less. A discussion of utility relocation to accommodate construction of the tunnel and above grade trackwork and stations is provided in Document 1.

Number of Downtown Stations

This issue was raised previously in May 2009 when Council deliberated and approved the DOTT alignment and station locations. There are four underground stations planned to serve downtown Ottawa: Downtown West, Downtown East, Rideau and Campus. LeBreton Station, to the west of the core area will also serve development on the west side of downtown, including the proposed Escarpment Area development. Comments received during the consultation process have indicated a desire for either more, or fewer stations in the downtown Ottawa. Those advocating more stations have typically expressed concern over the spacing between downtown stations compared to other cities, the catchment area of each station, and the distance required to access each station given the potentially deep level of the tunnel. Others advocating fewer stations for the downtown identify vehicle travel time and cost savings as concerns.

Using a benchmark of 300-metre and 500-metre walking distances, it was demonstrated that the majority of the downtown area was within the catchment area of a station, as measured from the mid-point of the platform area. Separate access points from the platform level helps lessen the walking distance and travel time to the station. Walking distances are consistent with the City's guidelines for walking distances to transit stations.

Overall, the proposed number of stations serving the downtown area has struck a balance between optimal station spacing for transit vehicle performance and in-vehicle travel time and the need to provide access and coverage to the downtown area. This practice is consistent with other successful transit systems in other cities. Given the significant cost of constructing underground stations, provision of additional stations in the downtown is not recommended.

COMMENTS BY THE WARD COUNCILLOR(S)

N/A

LEGAL/RISK MANAGEMENT IMPLICATIONS

There are no legal/risk management impediments to implementing this report's recommendations.

CITY STRATEGIC PLAN

The recommendations contained herein directly and indirectly support the following objectives of the Strategic Plan.

A1. Improve the City's transportation network to afford ease of mobility, keep pace with growth, reduce congestion and work towards modal split targets.

B1. Attain transit goals (30% modal split) by 2021.

E6. Require walking, transit and cycling oriented communities and employment centres.

F2. Respect the existing urban fabric, neighbourhood form and the limits of existing hard services, so that new growth is integrated seamlessly with established communities.

F4. Ensure that City infrastructure required for new growth is built or improved as needed to serve the growth.

TECHNICAL IMPLICATIONS

N/A

FINANCIAL IMPLICATIONS

Detailed costing of the recommended plan includes an estimate for property acquisition, design, project management, construction, vehicles, and contingency. The capital cost estimate for this project is $2.1B, in 2009 dollars. The following is a summary of the major cost elements of the project:

- Transit Tunnel and Underground Stations $735 million
- Transitway to LRT Conversion $540 million
- Maintenance and Storage Facility and Vehicles $515 million
- Property, Public Art, Insurance $160 million
- Project Director's Contingency $100 million
- Project Office $ 50 million

This project estimate does not include escalation, and is subject to refinement as the project progresses through subsequent design phases, such as preliminary engineering and approval of a procurement model.

In a memo dated 23 October 2009 to the Mayor and members of Council from the Deputy City Manager and City Treasurer, the affordability of the DOTT project (as well as other rapid transit projects identified in Phase 1 of the TMP) was outlined. It was concluded that the City has the financial capacity to afford its share of all Phase 1 projects in accordance with the City's Fiscal Framework. The affordability model assumes that the two upper-tier levels of government will each contribute one-third of the total project costs. Once a preliminary agreement has been reached with our funding partners a subsequent report will be provided to Committee and Council for approval.

The draft 2010 budget includes a funding request of $74.3M in account 905176 LRT (Tunney's to Blair) to initiate property acquisition, preliminary engineering and procurement management. This allows the DOTT project to move forward from the planning/EA phase to implementation as quickly as possible.

Funding for the urban design study and downtown transportation study (post DOTT implementation) are available in existing transportation study accounts - 902973 Smart Growth Transit EAs, and 905184 Rapid Transit EAs.

SUPPORTING DOCUMENTATION

Document 1 Functional Design of Recommended Plan (pdf only)
Document 2 Summary of Consultations
Document 3 Transit Plan Critical Path

DISPOSITION

Following Committee and Council approval of the recommendations contained herein, Infrastructure Services and Community Sustainability will undertake the following:

- The formal Environmental Assessment (EA) process using the functional design to define the undertaking and file the Environmental Project Report with the Ministry of the Environment in accordance with Ontario EA Regulation 231/08 for transit projects.
- Initiate the property acquisition process, subject to the 2010 capital funding request.
- Initiate the preliminary engineering process, procurement management process, and property acquisition process.
- Undertake an urban design study and a transportation study for the downtown core area for post DOTT implementation.

SUMMARY OF PUBLIC CONSULTATIONS DOCUMENT 2

Downtown Ottawa Transit Tunnel: Tunney's Pasture to Blair via a Downtown LRT Tunnel		
Chronology of Consultation Meetings		
Date	**Consultation Type**	**Purpose**
13-Aug-08	CEAA, MOE Co-ordination Meeting	Project introduction and EA co-ordination
21-Aug-08	ACPDR #1	Project introduction and overview
09-Sep-08	ACG #1	Project introduction and overview
09-Sep-08	BCG #1	Project introduction and overview

Downtown Ottawa Transit Tunnel: Tunney's Pasture to Blair via a Downtown LRT Tunnel

Chronology of Consultation Meetings

Date	Consultation Type	Purpose
09-Sep-08	PCG #1	Project introduction and overview
29-Oct-08	ACG #2	Planning objectives, alternative alignments and evaluation methodology
29-Oct-08	BCG #2	Planning objectives, alternative alignments and evaluation methodology
29-Oct-08	PCG #2	Planning objectives, alternative alignments and evaluation methodology
02-Dec-08	ACG #3	Introduce expanded study area, draft evaluation results
02-Dec-08	BCG #3	Introduce expanded study area, draft evaluation results
02-Dec-08	PCG #3	Introduce expanded study area, draft evaluation results
16-Dec-08	PWGSC	Tunney's Pasture Design Alternatives
18-Dec-08	Joint ACG/BCG/PCG Meeting #1	Project introduction and overview for CG members in expanded study area
19-Dec-08	NCC	NCC input on alternative designs
06-Jan-09	NAC	NAC input on downtown alignments
21-Jan-09	ACG #4	Downtown stations, alternative designs for expanded study area, maintenance and storage facility overview
21-Jan-09	BCG #4	Downtown stations, alternative designs for expanded study area, maintenance and storage facility overview
21-Jan-09	PCG #4	Downtown stations, alternative designs for expanded study area, maintenance and storage facility overview
04-Feb-09	NCC	NCC Input on alternative designs
18-Feb-09	Downtown Stakeholders (BCG #5)	Alternative downtown alignments, surface transit operations and additional station opportunities
26-Feb-09	ACPDR #2	Alternative alignments and design options
26-Feb-09	Public Open House and Presentation #1	Project introduction and overview, alternative alignments and design options, draft evaluation results
10-Mar-09	Centretown Community Groups	Overview of Alternative Alignment and Station Layout
26-Mar-09	Rideau Viking Corporation, Rideau BIA	Alternative downtown alignments and surface transit operations
27-Mar-09	Downtown Coalition	Alternative downtown alignments and surface transit operations
27-Mar-09	University of Ottawa	Campus Station design options
16-Apr-09	Pedestrian and Transit Advisory Committee	DOTT project update
04-May-09	ACPDR #3	Preferred DOTT alignment and station locations
06-May-09	City of Ottawa Transit Committee	Committee approval of recommended DOTT Alignment and Station Locations
27-May-09	City of Ottawa Council	Council approval of recommended DOTT Alignment and Station Locations
11-Jun-09	MTO Co-ordination	Co-ordination of MTO projects with DOTT construction and DOTT impacts on Highway 417 corridor
22-Jun-09	Rideau Viking Corporation	Rideau Station impacts and connection opportunities
22-Jun-09	Joint ACG/BCG/PCG Meeting #2	Maintenance and Storage Facility site selection overview
24-Jun-09	Public Open House #2 (M&S Facility)	Maintenance and Storage Facility Introduction, Site Selection Evaluation and draft evaluation results
11-Aug-09	NCC	NCC Input on project
11-Aug-09	Rideau Viking Corporation	Rideau Station connection opportunities
17-Sept-09	CITE - Presentation	Overview of Recommended Plan
17-Sept-09	PTAC	Information related to Recommended Plan and Project Status
14-Oct-09	NCHCA – Trade Show	Overview of Recommended Plan
21-Oct-09	ACG #5	Overview of Recommended Plan
21-Oct-09	BCG #6	Overview of Recommended Plan
21-Oct-09	PCG #5	Overview of Recommended Plan

Downtown Ottawa Transit Tunnel: Tunney's Pasture to Blair via a Downtown LRT Tunnel		
Chronology of Consultation Meetings		
Date	**Consultation Type**	**Purpose**
26-Oct-09	Public Open House and Presentation #3	Overview of Recommended Plan
04-11-09	DOTT presentation to Bay Ward Community Council	Overview of Recommended Plan
08-Oct-09	City/NCC Scheduling/Information Sharing Working Group	Scheduling/Information Sharing with NCC
22-Oct-09	City/NCC	DOTT Scheduling and Timing Meeting
05-Nov-09	City/NCC Scheduling/Information Sharing Working Group	DOTT EA coordination meeting
05-Nov-09	DOTT presentation to West Wellington Community Association	Overview of Recommended Plan
06-Nov-09	MTO Co-ordination	Use of Queensway during DOTT construction and alternative bus routings/requirements

TRANSIT PLAN CRITICAL PATH DOCUMENT 3

Transit Plan Critical Path – Updated December 7, 2009				
Memo & Reports				
Tabled/Memo Date	**Transit Committee Date**	**Council Date**	**Title**	**Description**
23-Oct-09	Listed as an IPD on 16-Dec-09		Cost and Affordability Memo	Update to City Treasurer's September 2008 memo advising council of the affordability of the city's Transit Plan. This memo included updated DOTT project costing.
21-Oct-09	18-Nov-09	25-Nov-09	Rail System Selection Report	Council was presented with technology options for the Rapid Transit Plan
21-Oct-09	18-Nov-09	25-Nov-09	Transit Tactical Plan Report	Council was presented with Transit Services 10 year Tactical Plan
	21-Oct-09		RFI (Stakeholder Development Input) Report	Committee was presented with a report for information about the results of the Request for Information for potential development opportunities/synergies with businesses located along the transit plan corridor
	Listed as an IPD on 16-Dec-09		Strategic Plan for Bus Route Connections	Committee will be presented with information about the integration of the LRT service with bus service.
	Will be placed on the agenda in Q1 2010 when we have more clarity around funding and functional design		Transit Procurement Analysis & Options Report	Committee will be presented with a report that summarizes the analysis that has been undertaken of the various procurement and delivery methods for the DOTT project inclusive of the Infrastructure Ontario model.
	Will be placed on the agenda once a funding agreement has been secured		Transit Investment Strategy Framework Report	Committee will be presented with a report that summarizes the analysis that has been undertaken of various financial tools that can be used to fund the TMP, encourage Transit Oriented Development and transit use.
	16-Dec-09	13-Jan-10	DOTT Planning & Environmental Assessment Report	Council will be presented with a Functional Design recommendation. This will initiate the formal EA process (final consultation and documentation)
	Will be placed on the agenda in once a funding		Business Development Strategy	Report on the development of opportunities/synergies with businesses located along the transit plan corridor

	agreement has been secured			
Processes				
	Start	**Finish**	**Title**	**Description**
	Q3 2009	Q3 2010	Infra Ontario (IO) Assessment	Infrastructure Ontario preliminary Value for Money Assessment, analysis of DOTT project and Alternative Finance Procurement (AFP) options, and Memorandum of Understanding (MOU) if selected as the City's procurement agent
	Q3 2009	Project completion	Start Up & Staff Project Office	Facilitate project progression including property acquisition, preliminary engineering, and procurement management. The project office will staff and operate to align with budget approvals and procurement decisions
	26-Oct-09	Q3 2011	Public Consultation / Industry Outreach	Open House on Functional Design occurred on October 26th. Consultation with stakeholders and the public will occur throughout the length of the project
	Q4 2009	Q1 2010	Provincial/Federal MOU	Senior government, memorandum of understanding (MOU), and funding agreement
	Q1 2010	Q1 2013	Acquire ROW Properties	Secure project properties and access rights along project corridor

	Q1 2010	Q2 2010	DOTT EA Process	Final consultation, documentation, and filing of Environmental Project Report to the Ministry of the Environment - for approval
	Q1 2010	Q2 2010	Engineering & Contract Management Support Consultant	Advance EA engineering to level suitable for procurement. This level will be defined when a procurement model is selected
	06-Apr-10	10-May-10	MOE Decision	Environmental Assessment approved by Provincial Ministry of Environment
	Q2 2010	Q3 2011	Preliminary Engineering	Advance EA engineering to level suitable for procurement. The level of engineering/design will be defined when a procurement model is selected
	Q3 2010	Q3 2011	Output Specifications	Advance output specifications to level suitable for procurement. This level will be defined when a procurement model is selected
	Q4 2010	Q3 2011	RFQ Process	Request for Qualification for project construction and vehicles
	Q3 2011	Q1 2013	RFP Process	Request for Proposal for project construction and vehicles