1. WESTERN LRT CORRIDOR (BAYVIEW TO BASELINE) PLANNING AND ENVIRONMENTAL ASSESSMENT - INTERIM PROGRESS REPORT

COULOIR OUEST DU TLR (DE LA STATION BAYVIEW À LA STATION BASELINE) PLANIFICATION ET ÉVALUATION ENVIRONNEMENTALE – RAPPORT D'ÉTAPE

COMMITTEE RECOMMENDATIONS

That Council:

1. **Receive the interim report and renewed work plan for the Western LRT Corridor Environmental Assessment as described in this report, and use this information to inform the Transportation Master Plan; and**

2. **Direct staff to undertake additional work as described in this report.**

RECOMMANDATIONS DU COMITÉ

Que le Conseil :

1. **prenne connaissance du rapport d'étape et du plan de travail revu pour l'évaluation environnementale du couloir ouest du TLR comme il est décrit dans le présent rapport et utiliser cette information pour le plan directeur des transports;**

2. **demande au personnel d'entreprendre des travaux additionnels comme il est décrit dans le présent rapport.**

DOCUMENTATION / DOCUMENTATION

1. Deputy City Manager, Planning and Infrastructure report dated 30 May 2012 (ACS2012-PAI-PGM-0132)
   Rapport de directrice municipale adjointe, Urbanisme et Infrastructure, daté du 30 mai 2012 (ACS2012-PAI-PGM-0132)

2. Extract of Draft Committee Minutes 6 June 2012
   Extrait de l'ébauche du procès-verbal du 6 juin 2012

Report to/Rapport au :

Transportation Committee
Comité des transports

and Council / et au Conseil

May 30, 2012
le 30 mai 2012

Submitted by/Soumis par : Nancy Schepers, Deputy City Manager/Directrice municipale adjointe, Planning and Infrastructure/Urbanisme et Infrastructure

Contact Person / Personne ressource: *Vivi Chi, Manager/Gestionnaire, Transportation Planning/Planification des transports, Planning and Growth Management/Urbanisme et Gestion de la croissance*
(613) 580-2424 x 21877, Vivi.Chi@ottawa.ca

BAY (7), KITCHISSIPPI (15) Ref N°: ACS2012-PAI-PGM-0132

SUBJECT: WESTERN LRT CORRIDOR (BAYVIEW TO BASELINE) PLANNING AND ENVIRONMENTAL ASSESSMENT - INTERIM PROGRESS REPORT

OBJET : COULOIR OUEST DU TLR (DE LA STATION BAYVIEW À LA STATION BASELINE) PLANIFICATION ET ÉVALUATION ENVIRONNEMENTALE – RAPPORT D'ÉTAPE

REPORT RECOMMENDATIONS

That the Transportation Committee recommend that Council:

3. **Receive the interim report and renewed work plan for the Western LRT Corridor Environmental Assessment as described in this report, and use this information to inform the Transportation Master Plan; and**

4. **Direct staff to undertake additional work as described in this report.**

RECOMMANDATIONS DU RAPPORT

Que le Comité des Transports recommande que le Conseil :

3. **prenne connaissance du rapport d'étape et du plan de travail revu pour l'évaluation environnementale du couloir ouest du TLR comme il est décrit dans le présent rapport et utiliser cette information pour le plan directeur des transports;**

4. **demande au personnel d'entreprendre des travaux additionnels comme il est décrit dans le présent rapport.**

EXECUTIVE SUMMARY

Assumptions and Analysis

The objective of the Western Light Rail Transit corridor is to provide for a rapid transit connection between Bayview and Baseline Stations. One of the main objectives of this Planning and Environmental Assessment Study is to identify the best LRT corridor alignment to satisfy future travel demand. Two types of travel demand were identified, regional and local. The 2008 TMP identified a primary corridor in the north part of the study area to accommodate regional demand and a supplementary corridor along Carling Avenue to accommodate local demand and support urban development and revitalisation.

The study examined the possibility of developing one LRT corridor to serve both regional and local functions. Due to varying characteristics of the two types of transit demand, ridership levels and patterns, land development expectations, and the fairly wide study area, it was concluded that a combined corridor would not adequately address local and regional needs. Then, the study identified various combinations of the primary and supplementary lines. Finally, 15 primary corridor alignments were identified and evaluated.

All 15 corridors were designed to provide similar operating characteristics. These include same (or similar) number of stops, and an operating environment that is free of congestion or traffic signal control delay. This type of operating environment is essential for having a reliable, high frequency primary LRT line. As a result, all of the corridors were designed with grade separations at intersections. The LRT corridors along Carling have sections that are elevated, and the corridors along Richmond/Byron have underground sections. In each case, the designs were configured to achieve grade separation at the lowest possible capital cost.

The corridors, the evaluation factors, and weights were developed by the Study Team with input from Agency, Business and Public consultation groups. The evaluation was based on 43 indicators grouped into 9 evaluation categories and the Multi-Criteria Decision Analysis method (standardized method) was used.

Based on the evaluation results, the northern corridors (Richmond/Byron variations and Ottawa River Parkway) scored the highest, and the Carling corridors scored the lowest. A description of all 15 corridors and a more detailed analysis of the top four corridors are provided.

At this point, staff have not concluded which of the top four corridors would be the preferred transit solution for Ottawa's transit network as further analysis is required before any such clear determination can be reached.

Financial Implications
The final report with the study recommendations will include the full cost to implement the Western LRT project.

Public Consultation/Input

Agency, Business, and Public Consultation Groups have been formed early in the study. The consultation groups have been involved in the development of the Study Design, the development of the planning objectives and design criteria, the identification of the long list of alternative corridors as well as the identification of the shortlisted 15 alignments, and in the development of the evaluation criteria and weights.

The NCC's participation began with the development of the study's Statement of Work. Presentations have also been made to the Commission's Executive Management Committee (13 April 2011) and Advisory Committee on Planning, Design and Realty (5 May 2011).

The first Public Open House was on 29 November 2010 where the study was introduced to the general public. A summary of the main comments received to date include concerns for the Ottawa River Parkway corridor and its green space, effects on the Byron linear park, impacts on existing communities, and support for corridors that encourage transit-oriented development.

SOMMAIRE

Hypothèses et analyse

L'objectif du couloir ouest du train léger est de fournir une liaison rapide de transport en commun entre les stations Bayview et Baseline. L'un des principaux objectifs de cette étude de planification et d'évaluation environnementale est de repérer le meilleur tracé pour le couloir afin de répondre à la demande future en transport. Deux types de demandes ont été reconnues, soit régionale et locale. Le Plan directeur des transports (PDT) de 2008 a repéré un premier couloir dans la partie nord du secteur à l'étude qui pourrait servir à répondre à la demande régionale et un couloir supplémentaire le long de l'avenue Carling pour répondre à la demande locale, en appui au développement urbain et à la revitalisation.

L'étude a examiné la possibilité d'aménager un seul couloir de TLR qui répondrait aux besoins régionaux et locaux. En raison des diverses caractéristiques des deux types de demande de transport en commun, des niveaux et des schémas d'achalandage, des attentes quant à l'aménagement des terrains et de l'étendue relative de la zone à l'étude, il a été conclu que le couloir combiné n'est pas une solution appropriée qui satisferait aux besoins locaux et régionaux. Ensuite, l'étude a repéré un ensemble varié de lignes primaires et supplémentaires. Finalement, 15 tracés pour le couloir principal ont été localisés et évalués.

Les 15 couloirs comportent des caractéristiques d'exploitation similaires. On parle notamment du même nombre d'arrêts (ou équivalent) et d'un environnement d'exploitation sans délai lié à la congestion ou à des feux de signalisation. Ce type d'environnement d'exploitation est essentiel si l'on veut créer une ligne principale de TLR qui soit fiable et qui peut prendre en charge une forte circulation. En conséquence, tous les couloirs ont été conçus avec un changement de niveau aux intersections. Les couloirs du TLR le long de l'avenue Carling comportent des segments surélevés et les couloirs le long de Richmond/Byron des segments souterrains. Dans tous les cas, les projets ont été élaborés afin que le changement de niveau se fasse au plus bas coût possible.

Les couloirs, les facteurs d'évaluation et les pondérations ont été élaborés par l'équipe de l'étude, qui a utilisé l'information des groupes de consultation des organismes, des entreprises et du public. L'évaluation était fondée sur 43 indicateurs regroupés en neuf catégories d'évaluation; la méthode d'analyse décisionnelle multicritères (approche normalisée) a été utilisée.

Selon les résultats d'évaluation, les couloirs nord (les diverses variations Richmond/Byron et la promenade de l'Outaouais) ont obtenu les notes les plus élevées et les couloirs le long de Carling les notes les plus faibles. Une description des 15 tracés de couloirs et une analyse plus détaillée des quatre couloirs qui se sont le mieux classés sont fournies.

À l'heure actuelle, le personnel n'a pas décidé lequel des quatre couloirs ayant obtenu les notes les plus élevées serait la solution privilégiée pour le réseau de transport d'Ottawa, car il faut procéder à d'autres analyses avant d'être en mesure de prendre une décision éclairée.

Répercussions financières

Le rapport final accompagné des recommandations de l'étude comprendra le coût total de la mise en œuvre du TLR ouest.

Consultations/commentaires publics

Des groupes de consultation avec des organismes, des entreprises et le public ont été formés au début de l'étude. Les groupes de consultation ont participé à l'élaboration de la conception de l'étude, de l'élaboration des objectifs de planification et des critères de conception, à l'établissement de la liste longue de solutions de remplacement pour le tracé des couloirs et à l'établissement des 15 tracés de la liste courte, ainsi qu'à l'élaboration des critères d'évaluation et des pondérations.

La participation de la CCN a commencé à l'étape de l'élaboration de l'énoncé de travail de l'étude. Des présentations ont également été faites devant le Comité de la haute direction (13 avril 2011) et le Comité consultatif sur l'urbanisme, le design et l'immobilier (5 mai 2011) de la Commission.

La première séance portes ouvertes a eu lieu le 29 novembre 2010 pour la présentation de l'étude au grand public. Le résumé des commentaires principaux reçus jusqu'à maintenant inclut les préoccupations au sujet du couloir de la promenade de l'Outaouais et des espaces verts adjacents, les conséquences sur le parc linéaire Byron, sur les communautés existantes et le soutien aux couloirs qui favorisent un aménagement axé sur le transport en commun.

BACKGROUND

The 2008 Transportation Master Plan (TMP) identified a rapid transit network for the City. The first project to be implemented is the Ottawa Light Rail Transit (OLRT) line between Blair and Tunney's Pasture stations, including a downtown transit tunnel. Once operational in 2018, the OLRT line is expected to resolve the most pressing transit capacity issues across downtown.

To build upon the OLRT, one of the next projects includes the Western Light Rail Transit (WLRT) line, which will extend the light rail service to Baseline station. This extension would move the bus-light rail (LRT) transfer point from Tunney's Pasture to Lincoln Fields and Baseline stations, which are both better positioned to accommodate future transfer activities.

The TMP shows the location of the WLRT line within the existing Transitway right-of-way and along the Ottawa River Parkway (ORP). From Bayview to Dominion (3.6 km), the WLRT runs within the Scott Street Transitway. From Lincoln Fields to Baseline station (2.7 km), the WLRT runs along the Pinecrest Creek segregated BRT corridor. Within the middle 3.9 km section, the TMP shows the light rail facility in the vicinity of the Ottawa River Parkway (ORP).

Ontario's Environmental Assessment legislation, in particular the Transit Project Assessment Process, allows the City to use the approved TMP as the justification for the transit project and to serve as a starting point for the environmental assessment (EA) of the WLRT. However, public feedback and comments during Council's

deliberation of the TMP in 2008 indicated a need to revisit the proposed alignment along the Ottawa River Parkway when an EA is undertaken. Of interest is the review of the Carling Avenue corridor as a potential candidate for the rapid transit WLRT project.

It should be noted that the Carling corridor is already identified in the 2008 TMP as a rail corridor, with street-car like characteristics and opportunities for integration with adjacent land uses. This level of transit service is well-positioned to serve local demand and is envisioned as a key catalyst for redevelopment and revitalization along the entire corridor. That said, it is important to note that this line was not intended to be a grade-separated rapid transit commuter line. Instead, it is intended to augment the rapid transit facilities identified in the TMP – such as the corridor identified in the vicinity of the Ottawa River Parkway. As such, in the TMP, Carling is identified as a Supplementary Transit Corridor, and the northerly Ottawa River Parkway as the Primary Rapid Transit Corridor.

The Statement of Work for the Planning and EA study of the WLRT was presented to and approved by Transit Committee on 17 June 2009 (http://ottawa.ca/calendar/ottawa/citycouncil/tc/2009/06-17/ACS2009-ICS-PGM-0050.htm). The purpose of the study is to identify and develop the most appropriate Primary rapid transit corridor between Bayview and Baseline, by assessing various candidate corridors between the Ottawa River Parkway to the north and the Carling corridor to the south.

The results of the study to date are presented in this report.

DISCUSSION

Need and Justification

The first component of the study is to assess the need for a rapid transit light rail corridor between Bayview and Baseline stations, including determining whether one or two corridors are required to serve the transit demand (both regional and local) in the study area.

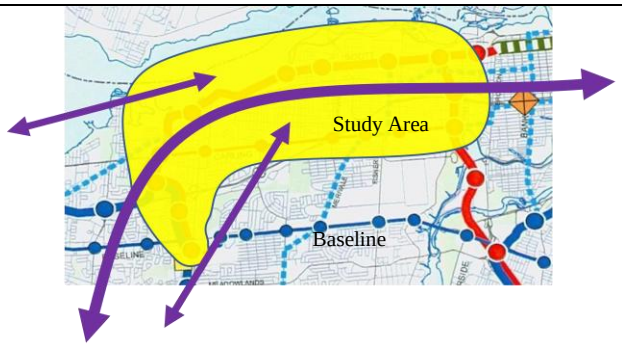

Figure 1: Illustration of regional needs

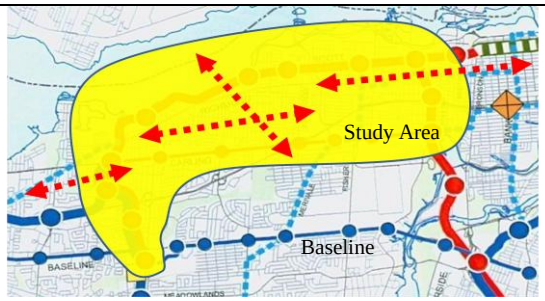

Figure 2: Illustration of local needs

Regional Transit Demand (Figure 1)

Regional demand include trips that travel across the study area and long distance trips between the study area and areas outside of it (mostly from Kanata/Stittsville and South Nepean to the downtown). Based on the City's TRANS model, regional travel from the west and south (across the Eagleson and Fallowfield screenlines) will more than double from 5,000 transit passengers per hour in 2005 to over 11,000 passengers per hour by 2031.

Regional transit demand is captured mostly by the primary transit line. The primary corridor is defined as a dedicated, high capacity route. The service provided in a primary corridor needs to be mostly separated from adjacent auto and pedestrian traffic to allow for greater speed and reliability. Providing sufficient capacity in the order of 12,000 to 14,000 passengers per peak hour and competitive transit travel times (compared to car travel times) are necessary to achieve the transit ridership and modal split targets of the City.

Typically primary corridors provide transit service with a limited number of stops, usually spaced between 800 and 2,000 metres apart, while supporting or encouraging nodal land use at each of these station locations.

Local Transit Demand (Figure 2)

Local demand includes trips originating and ending within the study area and between the study area and areas just outside, including the inner (downtown) area. The total number of trips within the study area is higher than the total number of regional trips; however, while regional trips are more concentrated in terms of the destination and are

easier to be served by rapid transit, local trips are more distributed within the study area, and thus cannot be served by one single corridor.

Although primary corridors are suited to longer regional trips, they do provide some local service and connectivity in the study area. Currently, local transit demand is accommodated mostly by local bus routes. Transit ridership analysis within the study area suggests that there is significant potential to capture more local trips by transit. Supplementary transit lines, which do not currently exist in the study area, could be implemented to better serve local needs and attract significant transit ridership away from auto travel.

Supplementary corridors complement the primary rapid transit network and provide a higher quality transit service than typical bus routes. In many cases supplementary lines are segregated from auto traffic at midblock sections to decrease travel time and its variability by eliminating congestion delay, but often intersect with major cross-streets at signalized intersections, where transit is typically given priority. The use of at-grade crossings minimizes infrastructure capital costs. However, to a certain degree, it also decreases speed and reliability compared to options that provide for full grade separation.

Typical supplementary corridors provide local service with more frequent stops, usually with stops spaced every 400 to 800 metres. The catchment area around a station is usually taken to be 600 metres. Supplementary lines encourage and support continuous development along the corridor, commonly described as main street type development and less concentrated land use at stations or stops.

Combining Regional and Local Transit Facilities into One LRT Line

The study examined if one higher-order corridor would be sufficient to address both the regional and local transit travel needs. Due to varying characteristics of the two types of transit demand, land development expectations, and the fairly wide study area, it is concluded that a combined corridor would not adequately address the local and regional/commuter transit trips.

There are a number of reasons why regional and local needs would be better accommodated by having a separate supplementary corridor in addition to the primary corridor. To retain existing transit users and to attract new transit riders, the primary corridor must provide a competitive travel time compared to the auto mode. To provide relatively shorter travel times, the primary transit service must have limited number of

stops, much less than what is optimal for a supplementary line. Furthermore, due to the existence of established and mature communities, the only feasible location for the primary corridor is either at the northern or the southern edge of the study area – leaving the large proportion of population and employment outside of the typical walking catchment area as a result.

In conclusion, to attract regional and local trips, both a primary and a supplementary corridor are required in the study area.

The purpose of this study is to develop the primary corridor. However, from the transit network perspective, the primary line cannot be assessed without a preliminary examination of the corresponding supplementary corridor as one affects the other. Once that assessment is complete, the study will then focus only on the functional design development of the primary corridor as per the approved Statement of Work.

Scenarios for Primary and Supplementary Lines

To identify the best placement for the primary and supplementary lines, three distinct scenarios were identified:

Option 1: Northern primary and Carling supplementary corridors;
Option 2: Carling primary and Northern supplementary corridors; and
Option 3: Hybrid primary corridor.

Option 1: Northern Primary and Carling Supplementary (Figure 3)

The primary corridor would be located in the northern part of the study area and could include a combination of the existing Transitway near Scott Street, the ORP corridor, and/or the Richmond/Byron corridor. The supplementary line would be along Carling Avenue connecting the O-Train with Lincoln Fields Stations. This scenario has a logical pattern of routes, which provide coverage and connectivity with relatively easy transfers and provide the primary east-west route with a direct connection to all existing Transitway stations, including Tunney's Pasture, and downtown.

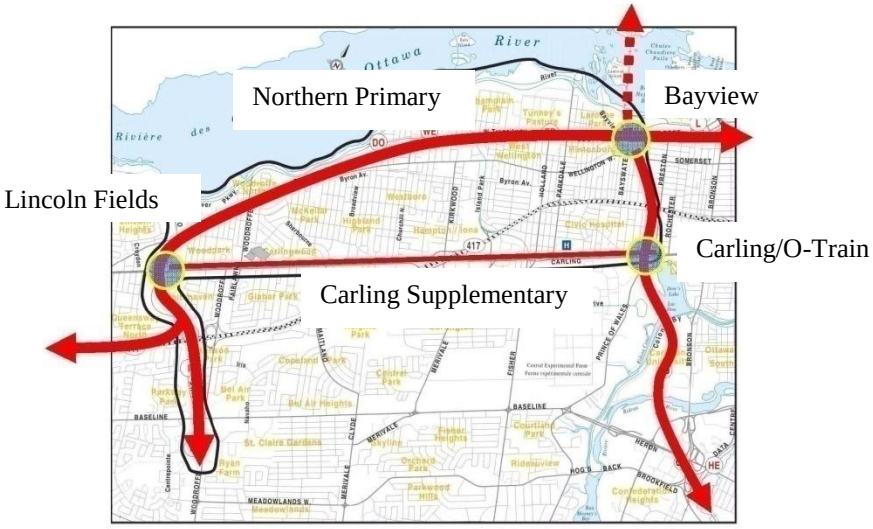

Figure 3: Northern primary and Carling supplementary corridors

Lincoln Fields Station is the planned western terminus of the Carling supplementary line, which could be extended further west in the future, and acts as a transfer station for local bus routes serving the local area.

Bayview Station provides a connection between the east-west primary line and the O-Train, which may provide a connection to Gatineau via the Prince of Wales Bridge in the future.

The Carling/O-Train station is the eastern terminus point of the supplementary line, which could be potentially extended east in the future, and acts as a transfer station between the Carling east-west and the north-south O-Train lines.

Option 2: Carling Primary and Northern Supplementary (Figure 4)

For this option, Carling would serve as the primary line, connecting Bayview and Lincoln Fields in the southern part of the study area, running along Carling and the O-Train corridors. The supplementary line would be in the northern part of the study area.

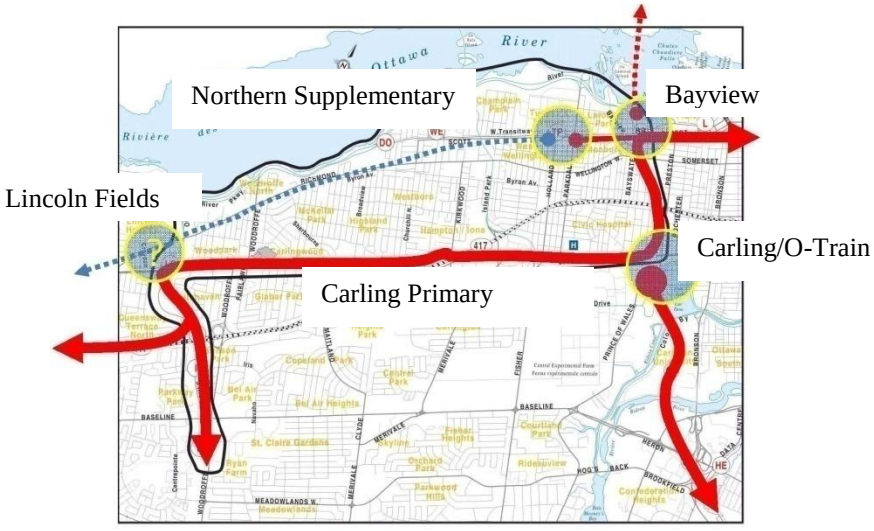

Figure 4: Carling primary and northern supplementary corridors

This combination of the primary and supplementary lines requires a modification to the 2008 TMP network configuration. Most likely, the operation of the O-Train would have to be terminated at the Carling/O-Train station, due to the frequency of trains along the east-west primary line. The termination of the O-Train at Carling also means that the long-term potential for a continuous extension to Gatineau is lost.

Existing Transitway stations, including Dominion, Westboro, and Tunney's Pasture would not be serviced by the primary line. A new supplementary corridor in the northern part of the study area would have to be developed. At the western end, the supplementary line would operate most likely along the Richmond/Byron corridor and the connection to Lincoln Fields station would have to be resolved as Richmond Road is approximately 500 metres north of Lincoln Fields.

Tunney's Pasture, the terminus of the OLRT and the likely eastern end of the supplementary line, would create an additional transfer station and if the selected technology is bus, then the bus loop would have to be retained indefinitely, rather than as an interim solution.

Option 3: Hybrid Primary and Split Supplementary (Figure 5)

The primary corridor runs along Carling in the west part and in the Transitway trench in the east part. The north-south transition can conceptually occur at a number of locations between Woodroffe and Holland Avenues. Supplemental service is split into two disjointed sections, and combined with additional transfer points will make it difficult to provide an effective supplementary transit service.

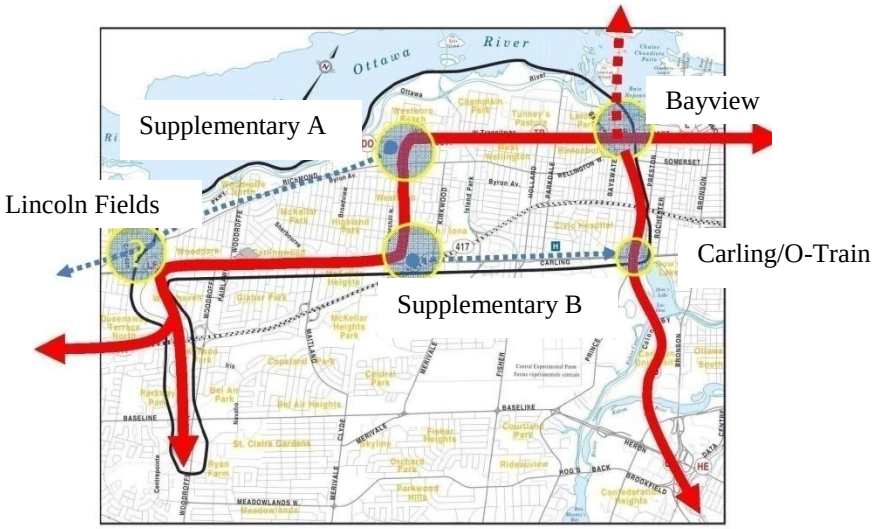

Figure 5: Hybrid primary corridor

This network scenario resolves some of the weaknesses of Option 2. The north-south operation in the O-Train corridor is not affected. Tunney's Pasture, and potentially some other existing Transitway stations (depending on the location of the north-south transition), remain on the primary line.

Development of Primary Corridors

In order to satisfy future transit needs the rapid transit corridor must satisfy capacity and operational performance requirements. In terms of capacity, 12,000 to 14,000 passengers per peak hour capacity is required, which translates to a four-car train service every 2-3 minutes. In terms of operational performance requirements the LRT line should not be impacted by vehicular congestion, traffic signals, or blockages due to collisions. This type of operating environment is essential for having a reliable, high frequency primary LRT line. As a result, all of the corridors were designed with grade separations at intersections.

From the three scenarios described above, and with public input a long list of candidate corridors were developed (Figure 6).

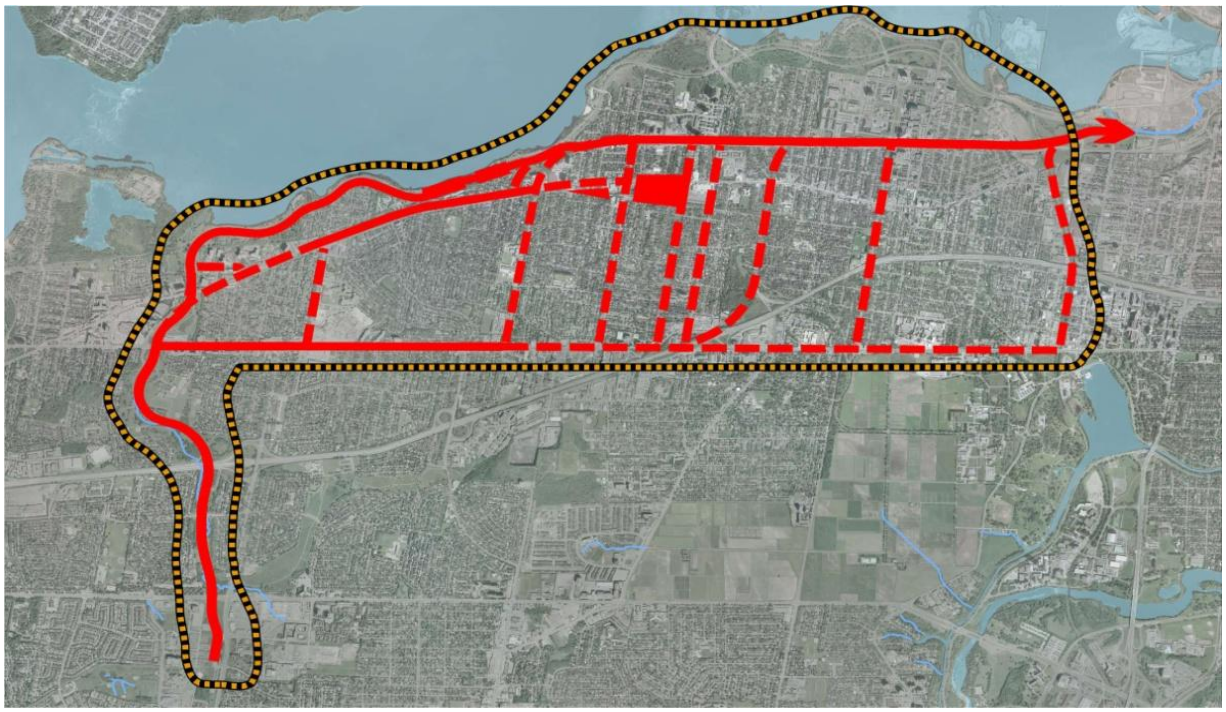

Figure 6: Identified potential WLRT corridors

In addition to the two basic northern corridors (Ottawa River Parkway (ORP) and Richmond/Byron) and the Carling/O-Train corridor, a number of hybrid corridors were identified. Hybrid corridors utilise both the existing Transitway near Scott Street and a section of the Carling corridor. The preliminary screening reduced the initial set of corridors by removing hybrid corridors with significant technical challenges or resulted in major reduction in services (such as those utilizing Holland Avenue, Island Park Drive, McRae Avenue hydro corridor, and Broadview Avenue).

After the preliminary screening, a set of 15 distinct alternatives were developed and assessed for the section from Bayview to Lincoln Fields. The section between Lincoln Fields Station and Baseline Station has been assumed to be identical for all 15 alternatives – located in the existing Southwest Transitway along the Pinecrest Creek corridor.

The 15 corridors are listed below and a description summary is attached in Document 1.

1 Carling via O-Train
2 Carling via Kirkwood
3 Carling via Churchill
4 Richmond/Byron via Churchill/Richmond (with limited grade separation)

5 Richmond/Byron via Churchill/Richmond (with full grade separation)
6 Richmond/Byron via Churchill/Woodroffe (with limited grade separation)
7 Richmond/Byron via Churchill/Woodroffe (with full grade separation)
8 Richmond/Byron via Rochester Field/Richmond (with limited grade separation)
9 Richmond/Byron via Rochester Field/Richmond (with full grade separation)
10 Richmond/Byron via Rochester Field/Woodroffe (with limited grade separation)
11 Richmond/Byron via Rochester Field/Woodroffe (with full grade separation)
12 Richmond/Byron via ORP/Cleary/Richmond (with limited grade separation)
13 Richmond/Byron via ORP/Cleary/Richmond (with full grade separation)
14 Richmond/Byron via ORP/Cleary/Woodroffe
15 ORP

Evaluation Methodology

The evaluation of corridors was based on the Multi-Criteria Decision Analysis method. Nine design principles were identified through a workshop with Agency, Business and Public Consultation groups. These design principles were used to formulate the evaluation Criteria Categories, which are listed and described briefly.

Promote Smart Growth: The project will stimulate opportunities for land use intensification and transit oriented development (TOD) on adjacent lands and will provide transit service to existing uses.

Compatibility with Adjacent Communities: The project will be planned and designed to be an integral and compatible component of existing and planned communities that it traverses.

Protect Historical, Cultural and Archaeological Resources: The project will be planned to be unobtrusive and respectful vis-a-vis the heritage, archaeological, cultural and visual elements of the study area. It will be compatible with and uphold the area's historical, cultural, archaeological and artistic characteristics.

Create Successful Rapid Transit Stations: The project's rapid transit stations will be located within relatively short walking distances of medium and high density land uses, will be accessible, functional and integrated with other transportation networks.

Provide a Safe Facility: The projects infrastructure will provide for safe, efficient and reliable movement of passengers and transit vehicles as well as the routing of services and utilities.

Increase Ridership, Mobility and Capacity: The project will provide a fast, convenient, comfortable, reliable, and efficient rapid transit service that will be part of the rapid transit network, while being fully integrated with other transportation networks.

Maximize Sensitivity to Natural Environment: The focus of this category is to assess the potential effect of the alternative corridors on elements of the natural environment**.**

Apply Sustainable Design Best Practices: The project will exemplify best practices in energy and environmental design, including green infrastructure choices.

Wise Public Investment: The identification of the economic factors to determine whether or not it is an acceptable solution to those who will ultimately pay for implementation and to identify public sector capital funding needs.

Following the selection of Criteria Categories members of the three Consultation Groups and members of the Study Team assigned weights to each category, to reflect the relative importance of each Criteria Category (Table 1).

Table 1: Criteria Category and the associated weights

Criteria Category	Study Team	ACG	PCG	BCG	Blended (Average)
Promote Smart Growth	11.21	13.62	12.23	11.25	**12.08**
Compatibility with Adjacent Communities	13.04	10.75	14.09	10.00	**11.97**
Protect Historical, Cultural and Archaeological Resources	10.39	9.58	12.36	6.75	**9.77**
Create Successful Rapid Transit Stations	12.07	10.32	13.05	20.75	**14.05**
Provide a Safe Facility	6.50	9.71	7.27	9.50	**8.25**
Increase Ridership, Mobility and Capacity	13.79	11.94	12.32	16.75	**13.70**
Maximize Sensitivity to Natural Environment	8.32	13.17	11.05	5.75	**9.57**
Apply Sustainable Design Best Practices	6.93	10.50	9.14	4.75	**7.83**
Wise Public Investment	17.75	10.42	8.50	14.50	**12.79**

After the criteria has been developed and the criteria weighting exercise was complete each of the alternative corridor was scored by consultant specialists for each criteria. Scores and weights were multiplied and summed up for each of the 15 alternatives.

Results of Evaluation of Alternatives

The resulting scores for each alternative are shown in Figure 7. Higher total score means a better corridor. These scores were calculated by using the “blended” or average weights which included weights specified by the Study Team and the three Consultation Groups.

The top four corridors are the following:

- Richmond/Byron via Churchill/Richmond (with limited grade separation)
- ORP
- Richmond/Byron via ORP/Cleary/Richmond (with limited grade separation)
- Richmond/Byron via Rochester Field/Richmond (with limited grade separation)

Overall, the northern corridors with no or limited grade separation (Richmond/Byron and ORP) scored the highest. The alignments in the Carling corridor scored the lowest. The main reason for the low score is due to the significant negative impact on the overall transit network and capital cost captured by the Apply Sustainable Design Best Practices, Increase Ridership, Mobility and Capacity and Wise Public Investment criteria categories.

A sensitivity analysis was also performed to identify the impact of weights on the evaluation results. The following four scenarios were tested:

- Without considering costs;
- Without using any weights (or having the same weight for each category);
- Without the weights of the Study Team;
- By including only the four "key" Criteria Groups (*Promote Smart Growth, Compatibility with Adjacent Communities, Increase Ridership, Mobility and Capacity, and Wise Public Investment*).

The analysis concluded that although the ranking of the top four corridors may have changed as various evaluation factors were removed, they typically remained among the best five corridors.

Project Cost Comparisons

The evaluation criteria include the cost of implementation under the "Wise Public Investment" category. There is a large difference in the Capital Cost estimates between various corridors, but this difference is not obvious by looking at the Total Score alone. Therefore, the estimated Capital Cost is also presented parallel to the Total Score (Figure 8). The estimated Capital Cost for the alternatives varies significantly between approximately $562 million and $2.5 billion.

The capital costs were developed based on unit costs for major project elements. Land costs were estimated by applying an average cost for each land use category (e.g. commercial, residential, open space). For the Ottawa River Parkway, average land costs for properties adjacent to the corridor were applied to develop an estimated "market value" for the required right-of-way.

The cost estimates are intended for comparisons of corridor options only. To develop a full project cost estimate for the purposes of budgeting or financing, more detailed effort

is required for the selected corridor(s), and will be undertaken before the completion of the Study.

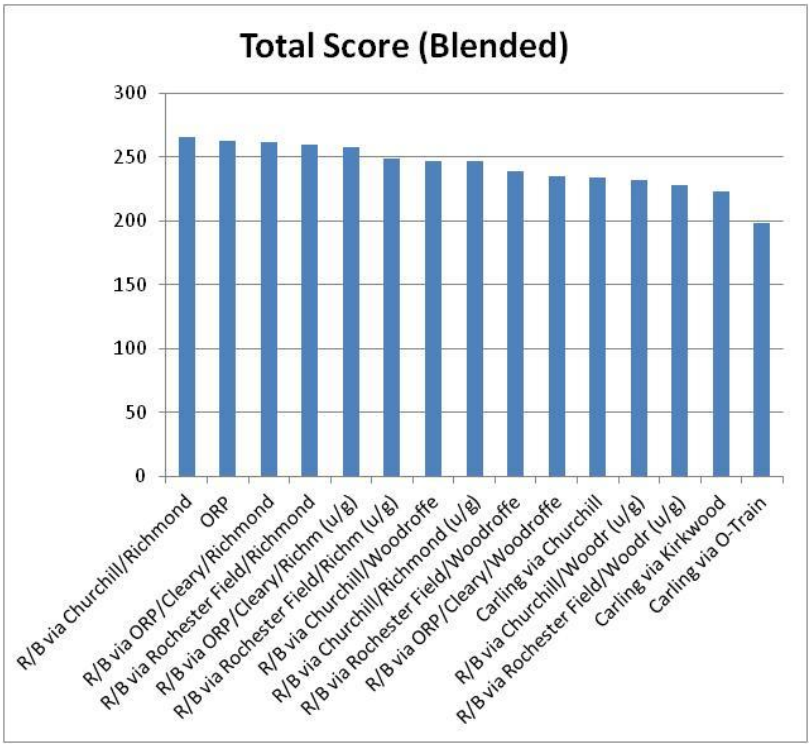

Figure 7: Scoring of alternative corridors

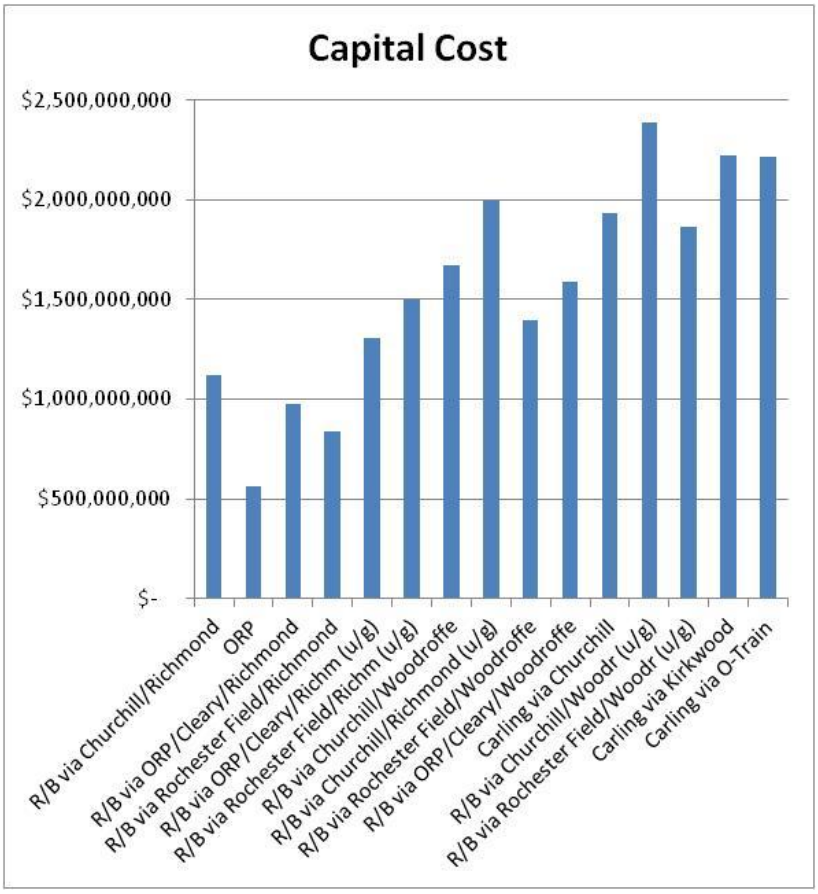

Figure 8: Capital cost estimates (2011 dollars)

The Top Four Corridors

The common characteristics of the top four corridors are:

- Achieve high overall scores and lowest capital investment required;
- Utilizes all or part of the existing Transitway asset (west of Tunney's Pasture);
- Requires limited grade separation; and
- Provides logical connectivity with other rapid transit lines including the O-Train/North-South LRT corridor and Carling.

Based on the results of the technical evaluation, and in no particular order, the top four corridors along with a brief summary of their major characteristics are as follows:

Richmond/Byron via Churchill (with limited grade separation) (Figure 9)
Advantages:

- Supports nodal transit-oriented development at Westboro, Churchill-Byron, and Cleary; and
- Least NCC land is required.

Disadvantages:

- Cost: the length of grade separated sections is the longest of the four; and
- Some impact on the Richmond/Byron linear green space.

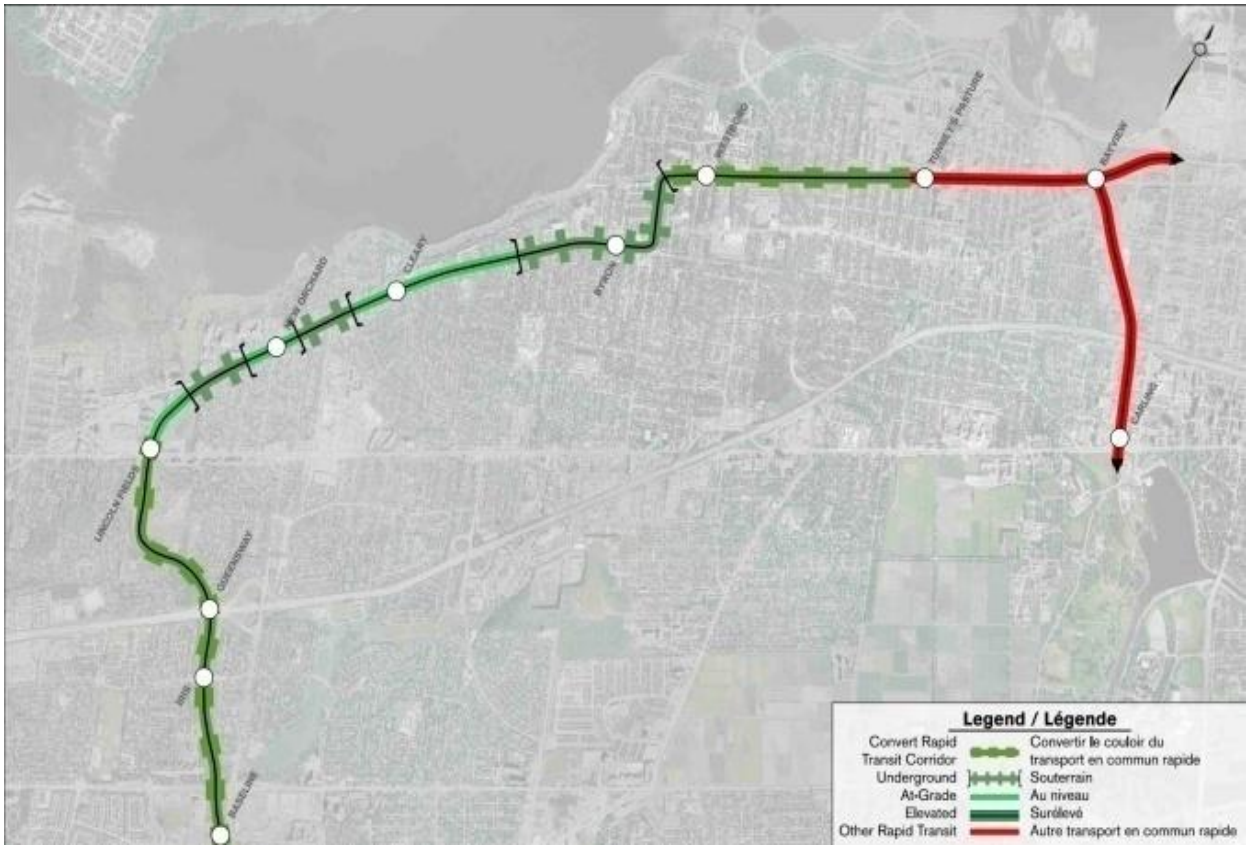

Figure 9: Richmond/Byron corridor via Churchill/Richmond

Ottawa River Parkway (ORP) (Figure 10)
Advantages:

- No negative impact on green space; and
- Transit access to the ORP's cultural landscape and recreation (at Dominion, Cleary, and New Orchard stations).

Disadvantages:

- Limited catchment area and transit-oriented land use potential around two of the stations (Cleary and New Orchard);
- Most NCC land required; and
- Changes the visual characteristics of the corridor (could also be an opportunity to enhance the corridor).

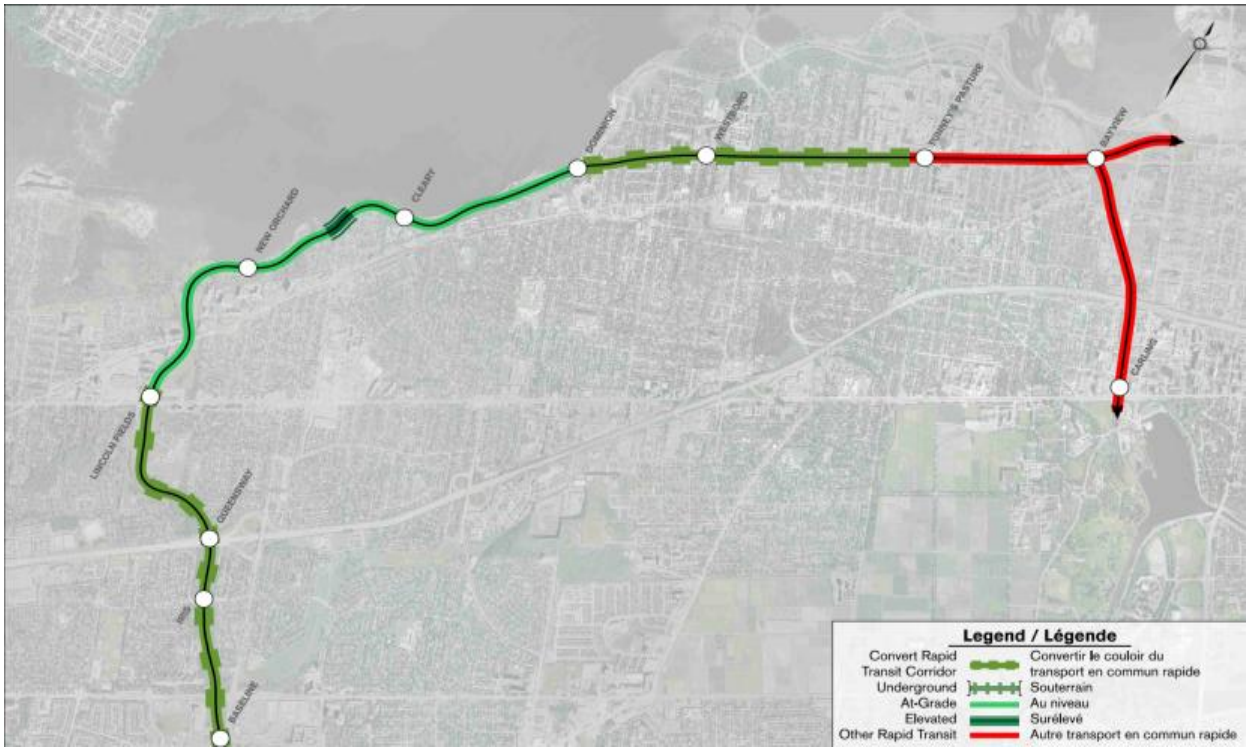

Figure 10: Ottawa River Parkway Corridor

Richmond/Byron via ORP, Cleary, and Richmond Road (with limited grade separation) (Figure 11)

Advantages:

- Most direct connection;
- Transit access to ORP's cultural landscape and recreation (at Dominion, Cleary);
- Utilizes the existing Transitway and existing stations (with some modifications).

Disadvantages:

- Limited catchment area and transit-oriented land use potential around the Cleary station site;
- Partly within the ORP corridor;
- Changes the visual character of the corridor;
- Some impact on ORP and Richmond/Byron green space.

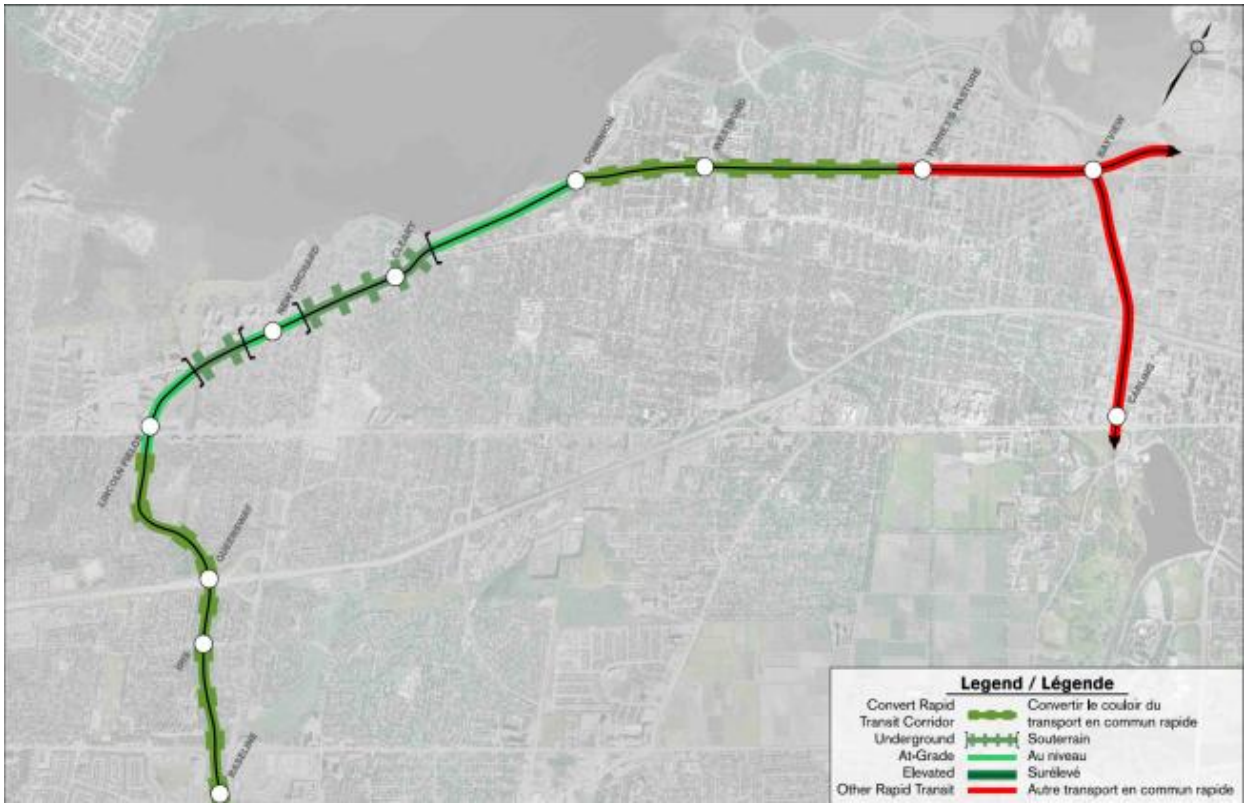

Figure 11: Richmond/Byron corridor via ORP, Cleary, and Richmond

Richmond/Byron via Rochester Field (with limited grade separation) (Figure 12)

Advantages:

- Transit access to ORP's cultural landscape and recreation (at Dominion);
- Supports nodal transit-oriented development at Westboro, Dominion, Cleary, and New Orchard.

Disadvantages:

- Some NCC land required (Rochester Field);
- Some impact on Richmond/Byron linear green space.

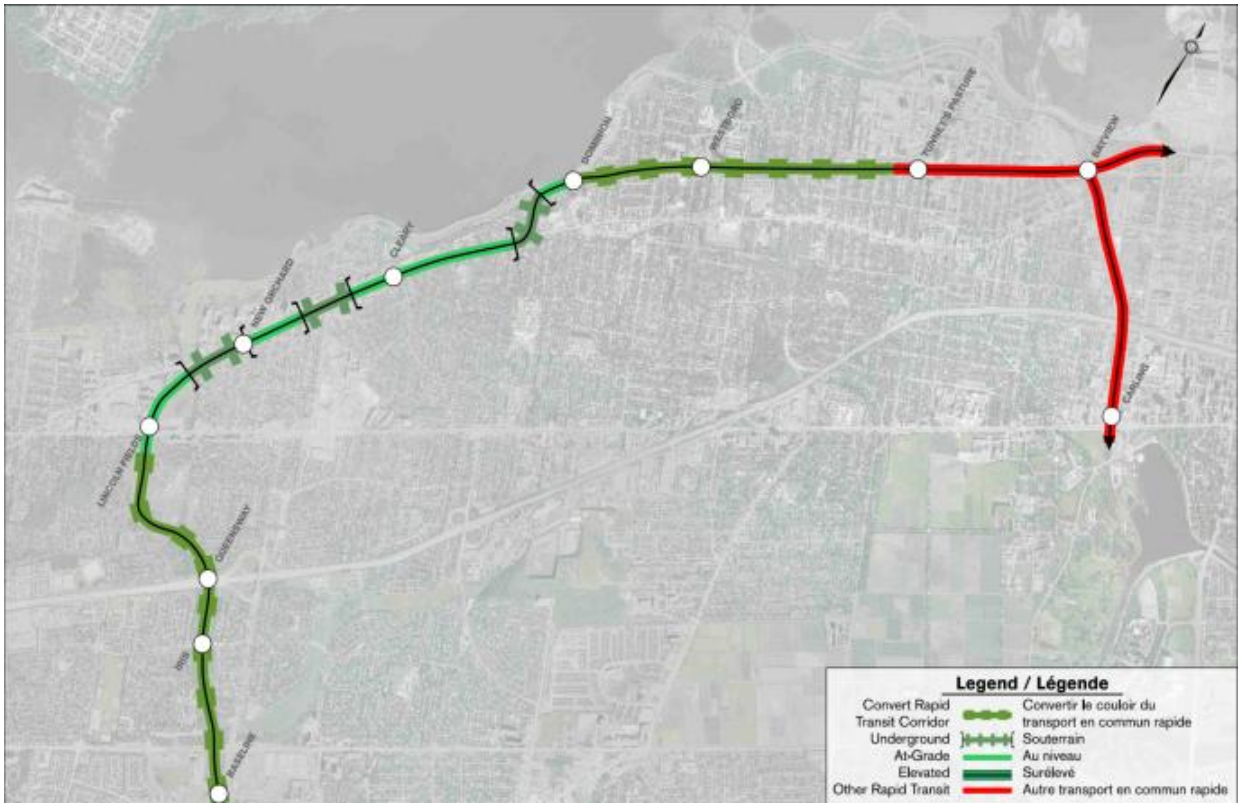

Figure 12: Richmond/Byron corridor via Rochester Field and Richmond

Carling Corridor (via O-Train): Supplementary vs. Primary Corridor

The Carling corridor did not score well as a Primary rapid transit corridor; however, its many attributes make it an excellent Supplementary corridor.

The spacing of stations for a supplementary line (400 m to 800 m) supports main street type development continuously along the entire corridor. The partially-exclusive ROW (segregated LRT lane and at grade intersection) provides competitive and reliable transit travel times while providing sufficient capacity for local needs. The at-grade transit stations allow easy transit access to developments along the corridor.

The Carling supplementary line, together with the northern primary line would provide a higher order transit service to most land uses within the Study Area.

Figure 13: Conceptual illustration of the Carling primary line

Carling as a primary rapid transit corridor has a number of significant challenges:

- Land uses along the existing Transitway stations (Dominion, Westboro, Tunney's Pasture) would lose the current frequent and rapid transit service;
- Travel demand of the high density land uses in Westboro would not be accommodated by rapid transit as was assumed when these developments were approved;
- Tunney's Pasture, which is currently the biggest employment node outside of downtown would cease to be on the primary rapid transit line;
- A new supplementary transit line would still be required to serve the northern part of the study area (and opportunity to implement such a line is limited);
- A new connection along the Ottawa River Parkway/Pinecrest Creek corridor (500 metres between Richmond Road and Lincoln Fields) would still be required – to connect the supplementary line to Lincoln Fields Station;
- A linear transfer point between the supplementary and primary lines would continue to be required at Tunney's Pasture;
- High frequency operation along the O-Train corridor between Carling and Bayview (approximately every two-three minutes by 2031) would create significant operating challenges along the O-Train corridor/north-south LRT line, probably requiring the termination of the O-Train or north-south LRT at Carling;
- Widening of the O-Train corridor to accommodate both lines would have significant impacts on the land uses along the corridor;
- To be a rapid transit corridor, Carling would have to be grade-separated for most of its length;
- At-grade intersections, even with a high level of signal priority to reduce transit delay and gates to minimize the potential for collisions would compromise the reliability of transit service;

- Significant capital cost (based on preliminary comparative costing), the Carling primary line would cost more than a northern primary line and a Carling supplementary LRT line combined.

Next steps

The preliminary evaluation results of the 15 alternative corridors will be discussed with the study's consultation groups, and the National Capital Commission.

As there is still a lot of work remaining to be done, the formal consultation with the general public will occur after the study team undertakes further development of the top four corridor options. Specifically, this work will address major components/issues of the project such as:

- The section from Lincoln Fields to Baseline Station
- The interrelationship between this project and that of the western section from Lincoln Fields to Pinecrest/Bayshore for Kanata transit users
- Station designs to minimize impact on the surrounding lands, particularly green space and the linear park along Byron
- Public access (pathways) to the river front
- Effects on vehicular traffic if travel lanes are converted to transit
- Detailed analysis of benefits, impacts, mitigation measures, and project estimates.

No decision is being made on an LRT line on Carling in this report; however, four options for a primary LRT line are rising to the top of the list through this assessment. Given that Carling is an important transit corridor, the next phase of this assessment will review its integration within the overall transit network to maximize ridership and TOD opportunities, and will explore project impacts and costing. As such, this analysis will complement the work done in the EA for a primary LRT line to assist Council in making a fully informed decision on its primary rapid transit network.

RURAL IMPLICATIONS

There are no rural implications associated with this report.

CONSULTATION

Agency, Business, and Public Consultation Groups have been formed early in the study. The consultation groups have been involved in the development of the Study Design, the development of the planning objectives and design criteria, the identification of the long list of alternative corridors as well as the identification of the shortlisted 15 alignments, and in the development of the evaluation criteria and weights.

The NCC's participation began with the development of the study's Statement of Work. Presentations have also been made to the Commission's Executive Management Committee (13 April 2011) and Advisory Committee on Planning, Design and Realty (5 May 2011).

The first Public Open House was on 29 November 2010 where the study was introduced to the general public. A summary of the main comments received to date include concerns for the Ottawa River Parkway corridor and its green space, effects on the Byron linear park, impacts on existing communities, and support for corridors that encourage transit-oriented development.

COMMENTS BY THE WARD COUNCILLOR(S)

Ward 7
Councillor Taylor stated:

"I support the extension of the LRT and transit facilities to and through my community and look forward to the outcomes of this project. At this point in time I do not feel that there is sufficient complete detail to make a determination as to the best route for a primary corridor from a value perspective (i.e., not just cost); however, I do support wholeheartedly an intensive look at Carling Avenue. I support the recommendations to continue this project and that it continue to inform refining the choices for western LRT."

Ward 15
Councillor Hobbs stated:

"I am supportive of the direction this report gives staff to further expand their examination of impacts of the four primary route options.

LRT on Carling Avenue is critical to the rejuvenation of the southern portion of Kitchissippi Ward, including sensitive development along the Carling corridor, and improved connections to hospitals, shopping centres, and our growing neighbourhoods. This is why I am supportive of the direction given to staff in this report to further review how this can operate as a supplementary line.

It is further clear to me that a northern primary route is critical for regional needs, as well as to serve northern neighbourhoods and the thriving Richmond Road and Wellington Street West corridor. By maintaining the rapid transit using the Ottawa River Parkway we can reduce the focus on cars in the greenspace, and improve connections to the riverfront and pathways for area residents while still providing the same number of stations at very similar locations for area residents. An important factor for Kitchissippi residents is improving access to the pathways from our neighbourhoods. It is critical that any route on the ORP have a plan for improving this access.

I look forward to this process moving forward and to seeing further results.”

LEGAL IMPLICATIONS

There no legal impediments to implementing the recommendations in this report.

RISK MANAGEMENT IMPLICATIONS

There are no risk management implications associated with this report.

FINANCIAL IMPLICATIONS

The final report with the study recommendations will include the full cost to implement the Western LRT project.

ACCESSIBILITY IMPACTS

There are no accessibility impacts associated with this report.

ENVIRONMENTAL IMPLICATIONS

This is an Environmental Assessment Study and implications on the environment are being addressed.

TECHNOLOGY IMPLICATIONS

There are no technological implications associated with this report.

TERM OF COUNCIL PRIORITIES

Transportation and Mobility

- TM1 – Ensure sustainable transit service
- TM3 – Provide Infrastructure to support mobility choices
- TM4 – Promote alternative mobility choices

Environmental Stewardship

- ES2 – Enhance and protect natural systems
- ES3 – Reduce environmental impact

SUPPORTING DOCUMENTATION

Document 1 Description of Shortlisted Corridors *(Immediately follows the report)*

DISPOSITION

Planning and Growth Management Department will continue with further work on this study.

DESCRIPTION OF SHORTLISTED CORRIDORS

DOCUMENT 1

This section includes a brief description of the 15 shortlisted corridors.

Carling via O-Train corridor

Figure 14: Carling corridor via O-Train

The primary line runs in the Carling corridor between Lincoln Fields and the O-Train, and the north-south connection to Bayview station is in the O-Train trench. At Bayview, the WLRT line turns east and goes to Blair through the downtown. Along the Carling corridor, the line is mostly elevated to avoid delays and potential for collisions at intersections. There are seven transit stations along Carling: Lincoln Fields, Woodroffe, Maitland, Kirkwood, Merivale, Parkdale, and O-Train), six of them are elevated.

Carling via Kirkwood

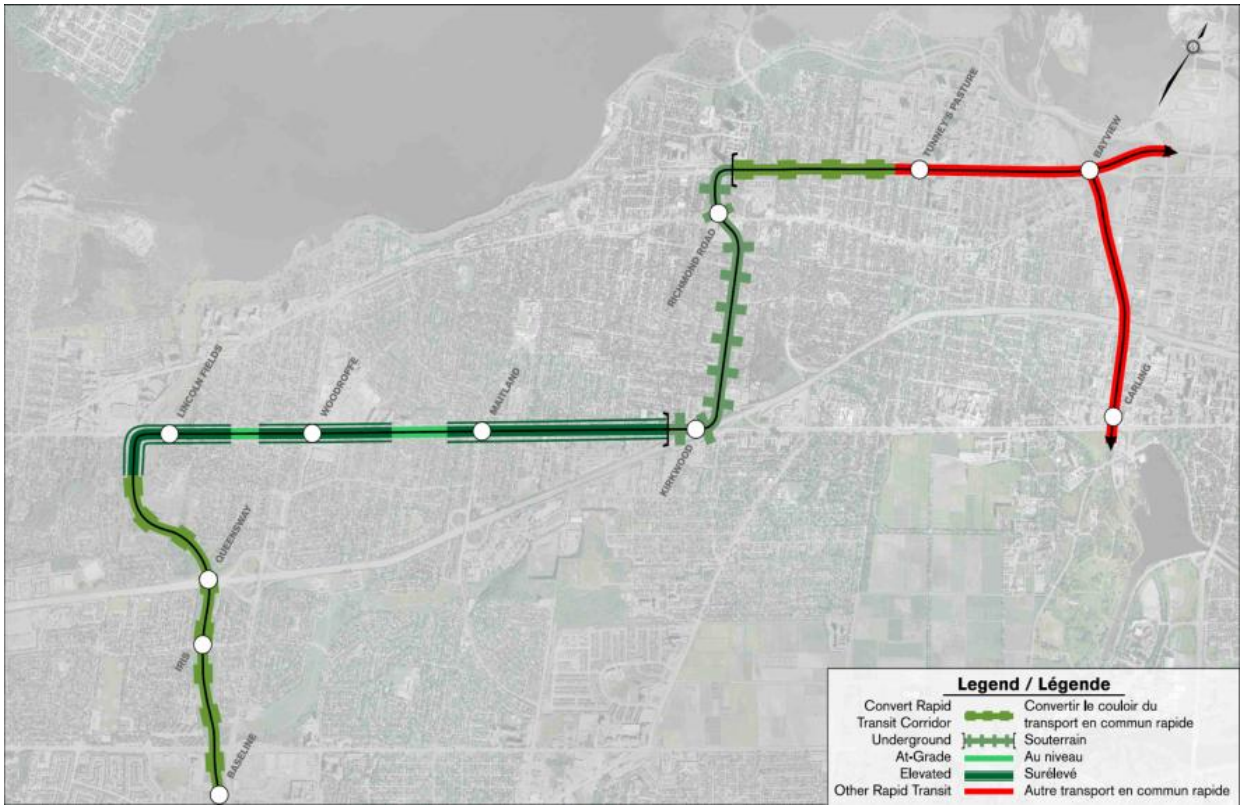

Figure 15: Carling corridor via Kirkwood

The primary line runs in the Carling corridor between Lincoln Fields station and Kirkwood. The north-south connection to the Scott Street trench is under Kirkwood Avenue. There is new station at Richmond Road because the line misses the existing Westboro station. Along the Carling Avenue corridor, west from Kirkwood Avenue, the line is identical to the Carling via O-Train alternative.

Carling via Churchill

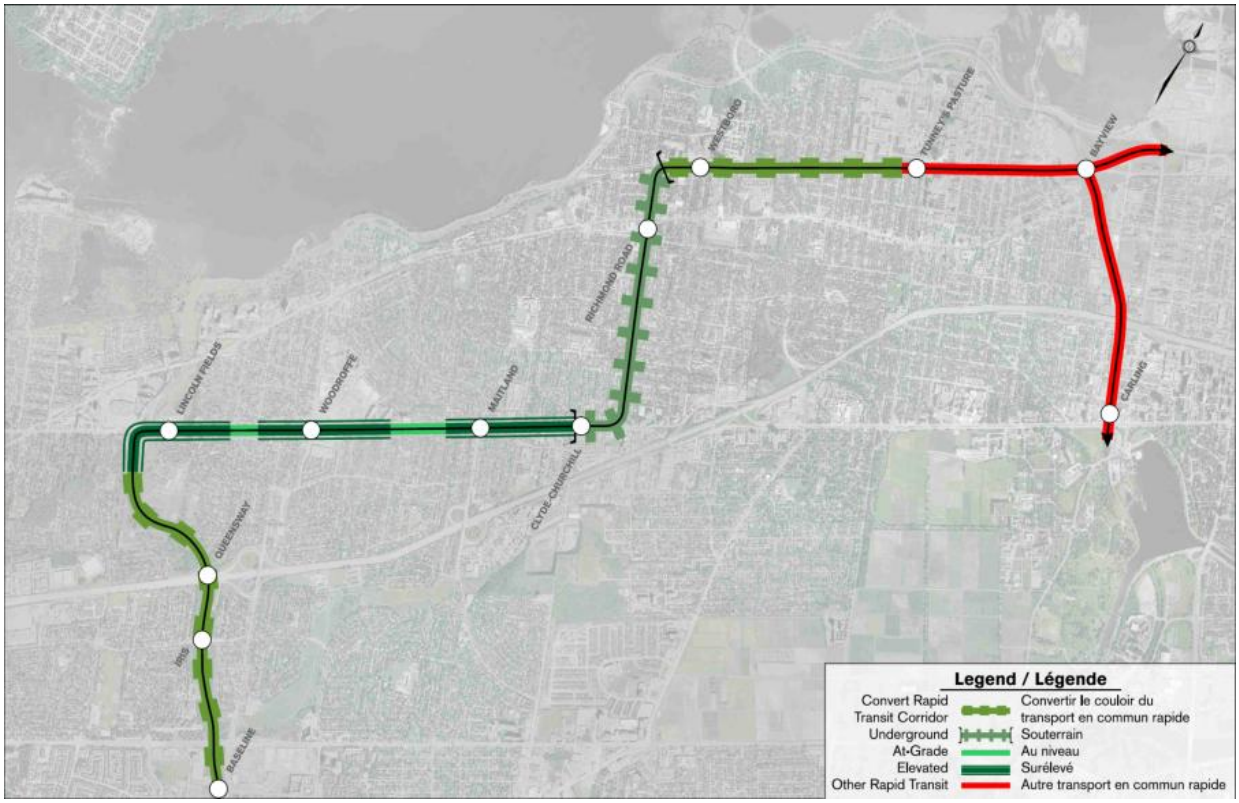

Figure 16: Carling corridor via Churchill

The primary line runs in the Carling corridor between Lincoln Fields station and Churchill. The north-south connection to the Scott Street trench is under Churchill Avenue. There is a new station at Byron Avenue. Along the Carling corridor, west from Churchill Avenue, the line is identical to the Carling via O-Train alternative.

R/B via Churchill/Richmond

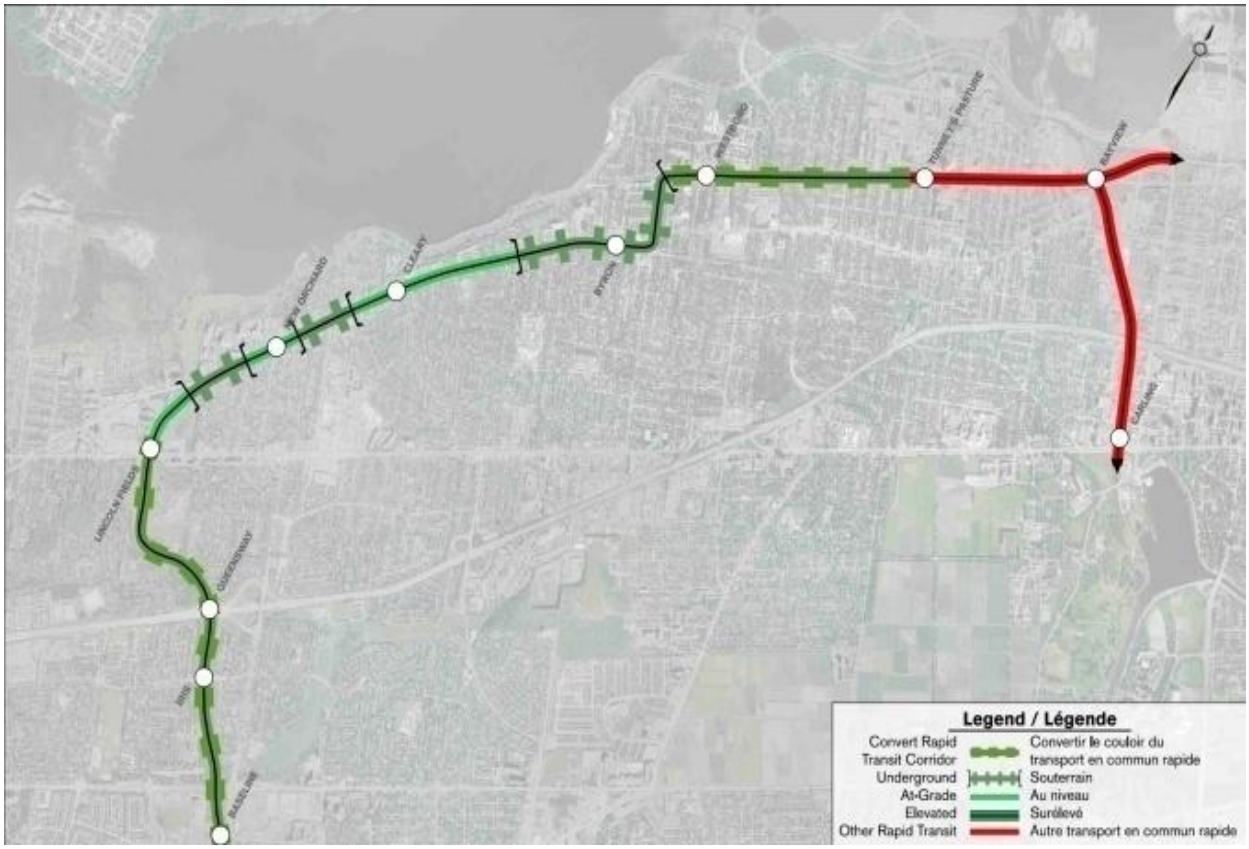

Figure 17: Richmond/Byron corridor via Churchill/Richmond

This alignment has two alternatives, one with limited grade separation and the other with full grade separation west of Dominion.

<u>With limited grade separation</u>

The primary line runs in the Richmond/Byron corridor between Lincoln Fields station and Churchill Avenue. A short north-south connection to the Scott Street trench is under Churchill Avenue. The existing Dominion station is not served; however, there are three new stations between Westboro and Lincoln Fields: Byron/Golden, Cleary and New Orchard. There are three underground sections: at the north-south transition from the Scott Street trench to the Byron Avenue, at Woodroffe Avenue, and at the connection between Richmond Road and the ORP.

<u>With full grade separation</u>

Same as above, but the entire section along the Richmond/Byron corridor is underground.

R/B via Churchill/ Woodroffe

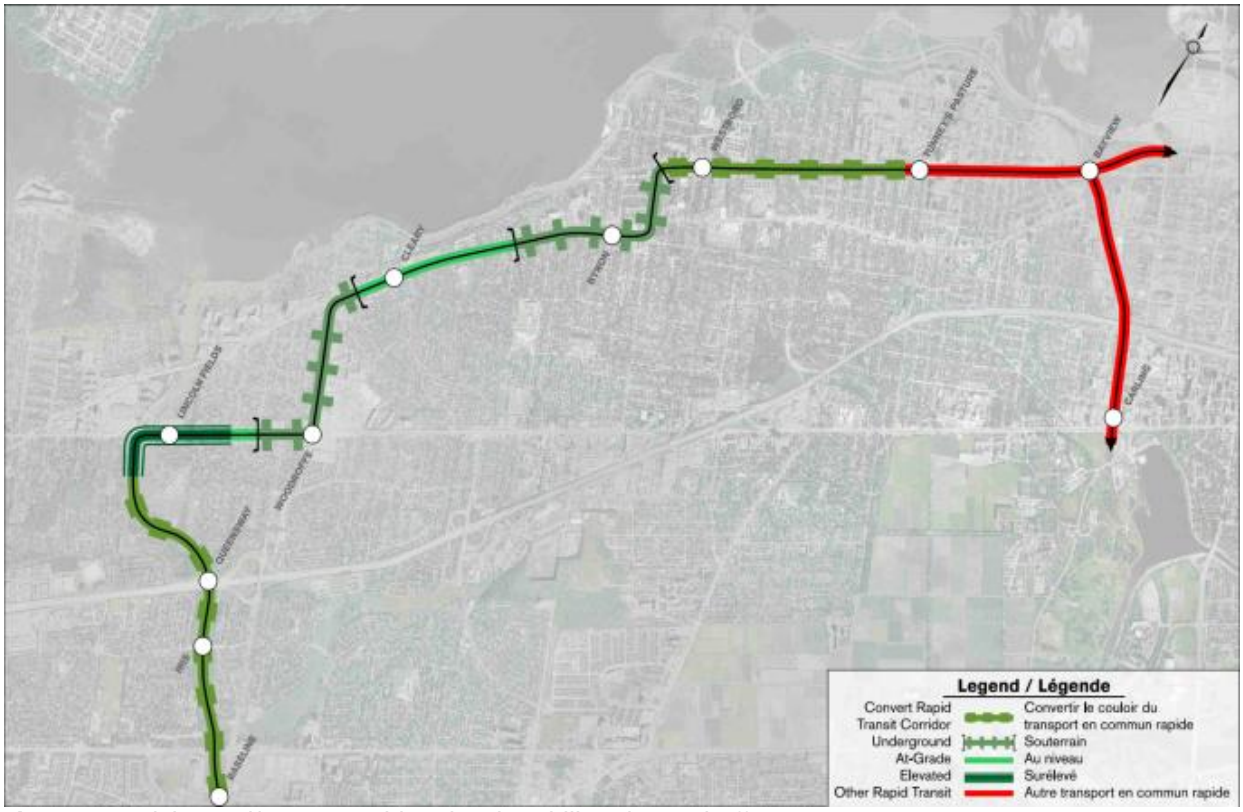

Figure 18: Richmond/Byron corridor via Churchill and Woodroffe

This alignment has two alternatives, one with limited grade separation and the other with full grade separation west of Dominion.

<u>With limited grade separation</u>

The primary line runs in the Carling corridor between Lincoln Fields and Woodroffe Avenue North (Carlingwood) and then transitions underground to the Richmond/Byron corridor. Further east it is the same as the previous alternative. The two transitioning sections (at Woodroffe and at Churchill) are underground.

<u>With full grade separation</u>

Same as the above, but the entire section along the Richmond/Byron corridor is underground.

R/B via Rochester Field/Richmond

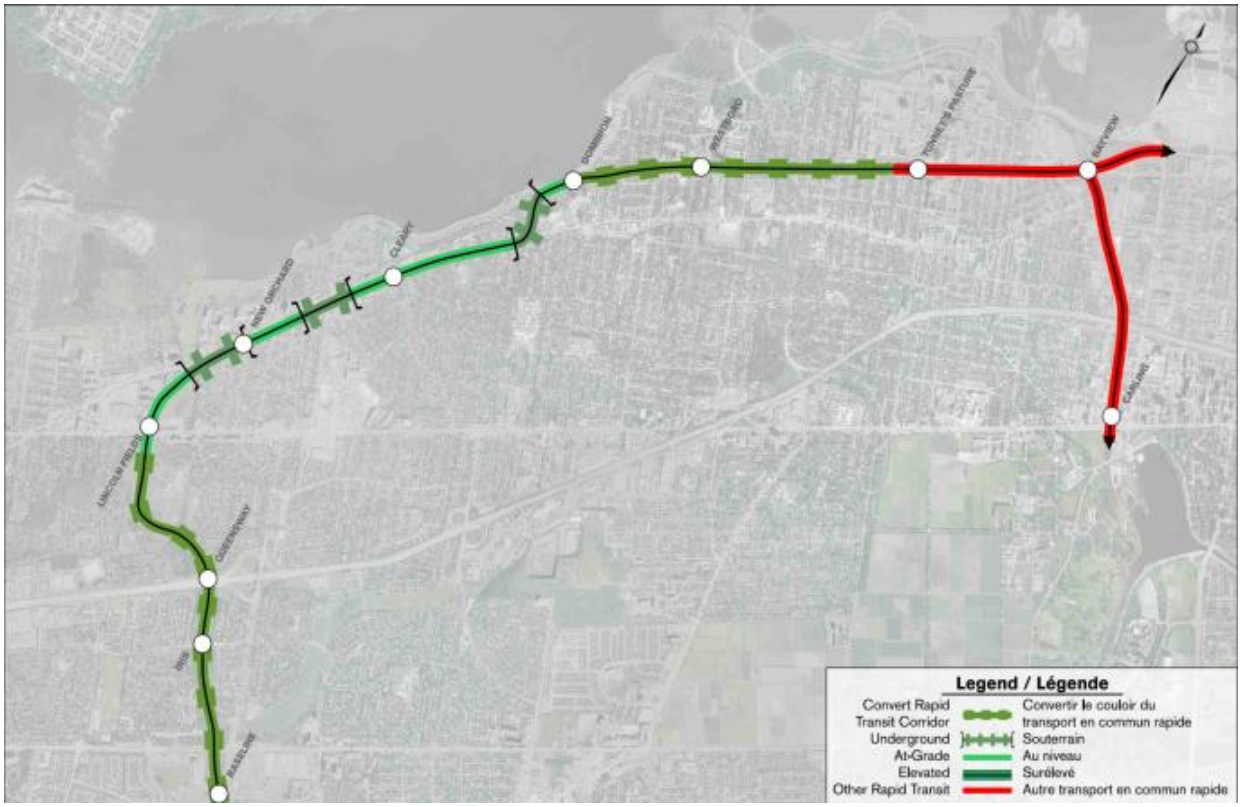

Figure 19: Richmond/Byron corridor via Rochester Field and Richmond

This alignment has two alternatives, one with limited grade separation and the other with full grade separation west of Dominion.

Limited grade separation

The primary line runs in the Richmond/Byron corridor between Lincoln Fields station and Rochester Field where it connects to the existing Dominion station. All existing Transitway stations are served and there are two new stations: New Orchard and Cleary. There are three short underground sections: at Rochester Field, Woodroffe Avenue, and Richmond/ORP. All stations are at grade.

With full grade separation

Same as above, but the entire section along the Richmond/Byron corridor is underground.

R/B via Rochester Field/Woodroffe

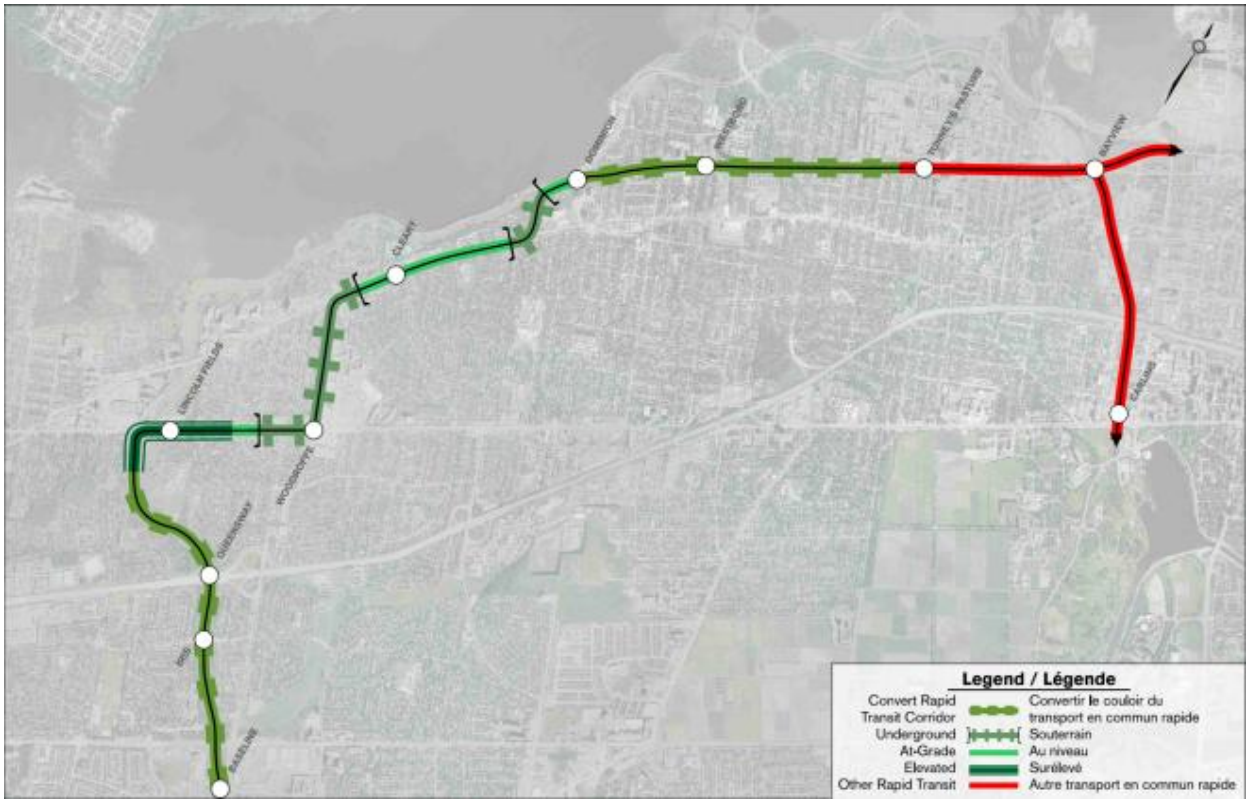

Figure 20: Richmond/Byron corridor via Rochester Field and Woodroffe

This alignment has two alternatives, one with limited grade separation and the other with full grade separation west of Dominion.

<u>With limited grade separation</u>

The primary line runs in the Carling corridor between Lincoln Fields and Woodroffe Avenue North (Carlingwood) and then transitions underground to the Richmond/Byron corridor. Further east it is the same as the previous alternative.

<u>With full grade separation</u>

Same as above, but the entire section along the Richmond/Byron corridor is underground.

R/B via ORP/Cleary/Richmond

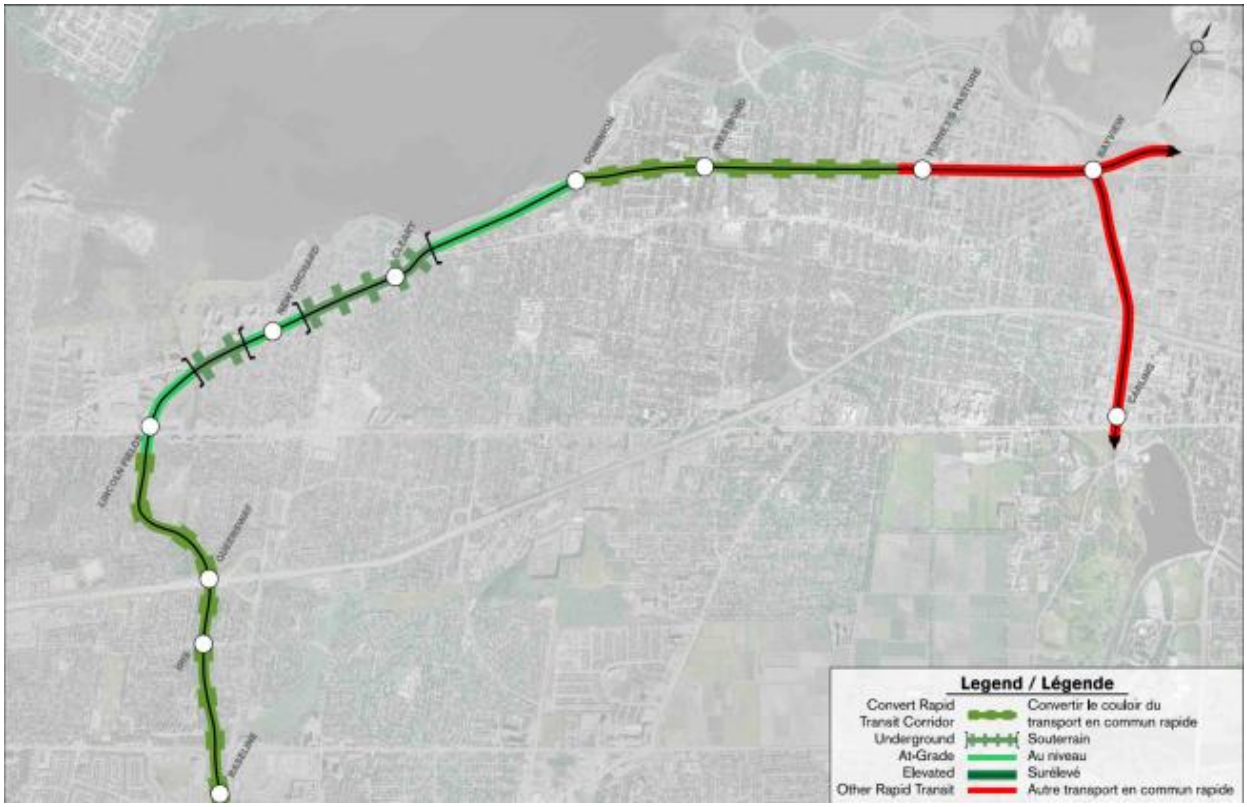

Figure 21: Richmond/Byron corridor via ORP, Cleary, and Richmond

This alignment has two alternatives, one with limited grade separation and the other with full grade separation west of Dominion.

Limited grade separation

The primary line runs in the Richmond/Byron corridor on the surface between Lincoln Fields station and Cleary Avenue where it has an underground connection to the ORP and runs on the south side of the eastbound vehicular lanes on the surface. All existing Transitway stations are served and there are two new stations: New Orchard and Cleary. Except the Cleary station, all stations are at grade.

With full grade separation

Same as above, but the entire section along the Richmond/Byron corridor is underground.

R/B via ORP/Cleary/Woodroffe

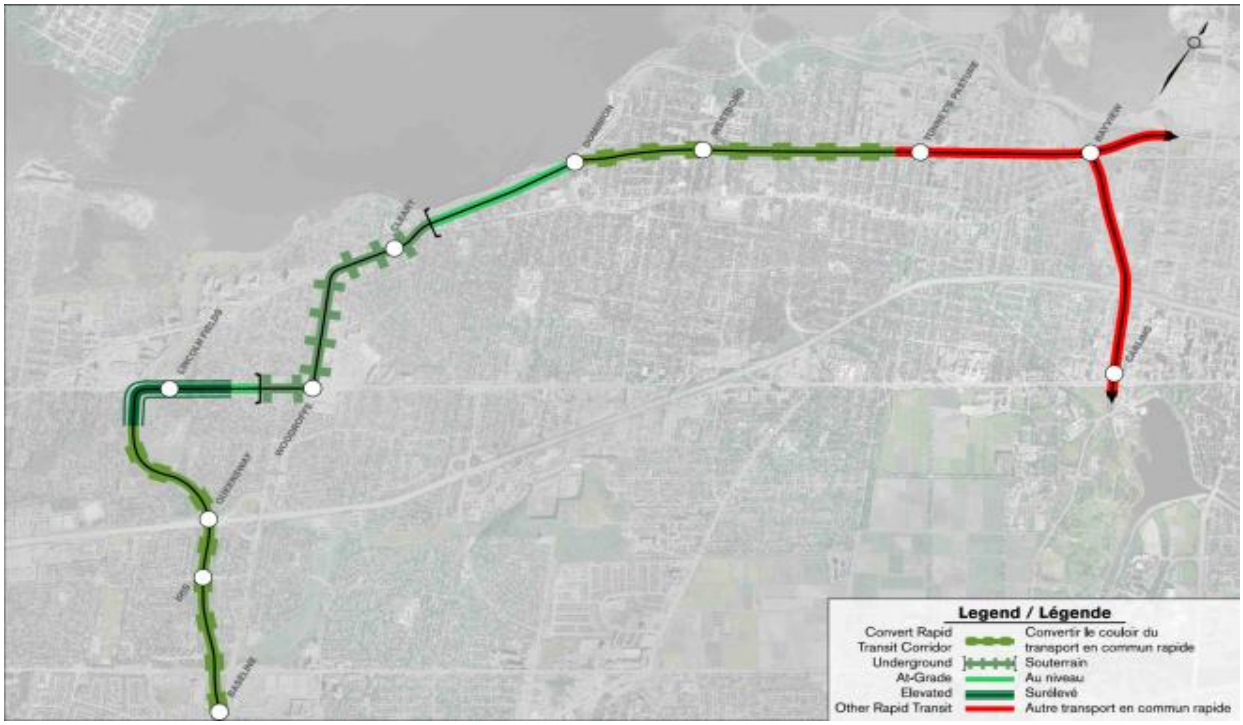

Figure 22: Richmond/Byron via ORP, Cleary, and Woodroffe

This alignment has two alternatives, one with limited grade separation and the other with full grade separation west of Dominion.

<u>With limited grade separation</u>
The primary line runs in the Carling corridor between Lincoln Fields and Woodroffe Avenue North (Carlingwood) and then transitions underground to the Richmond/Byron corridor. Further east it is the same as the previous alternative.

<u>With full grade separation</u>
Same as above, but the entire section along the Richmond/Byron corridor is underground.

ORP

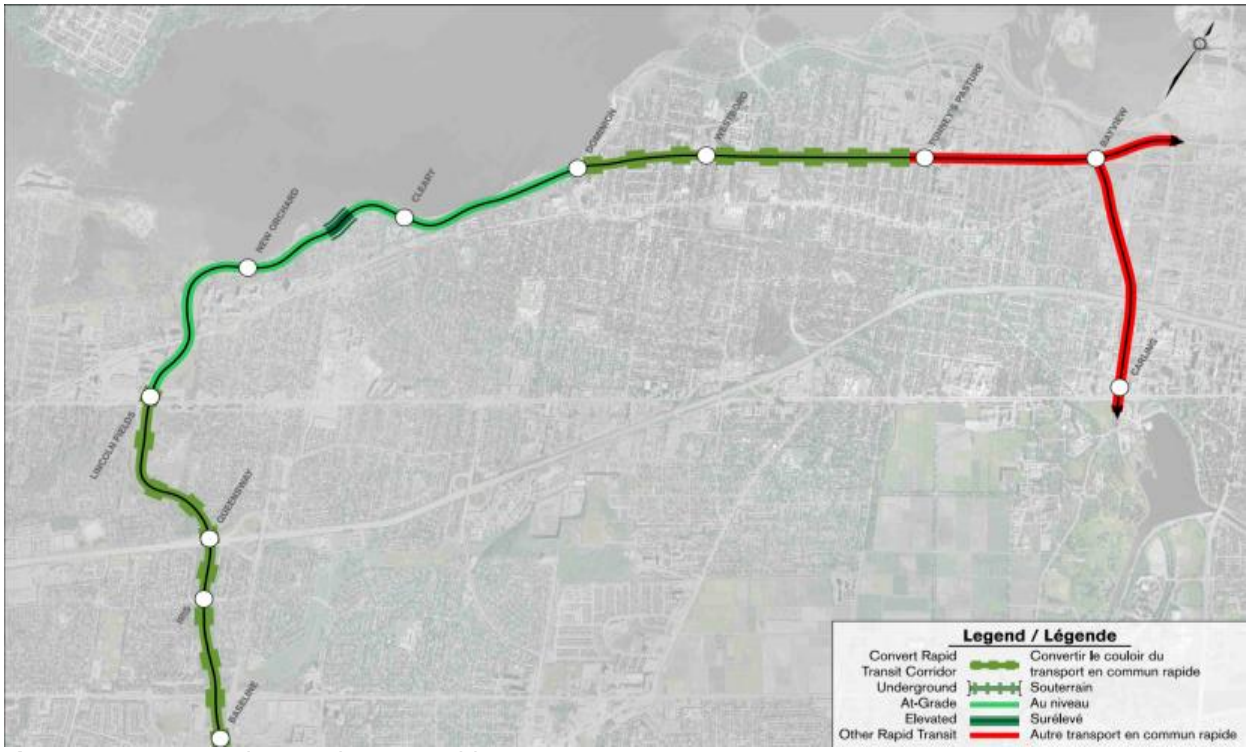

Figure 23: Ottawa River Parkway Corridor

The primary line runs along the Ottawa River Parkway. The westbound vehicular lanes are converted to two way traffic and the eastbound lanes are converted to accommodate LRT operation. All existing Transitway stations are served and there are two new stations: New Orchard and Cleary. There is a short grade separation at the connection to Woodroffe Avenue. The LRT operation is on the surface and all stations are at grade.

WESTERN LRT CORRIDOR EA INTERIM REPORT (CORRIDOR SELECTION)
ACS2012-PAI-PGM-0132 BAY (7), KITCHISSIPPI (15)

REPORT RECOMMENDATIONS

That the Transportation Committee recommend that Council:

1. **Receive the interim report and renewed work plan for the Western LRT Corridor Environmental Assessment as described in this report, and use this information to inform the Transportation Master Plan; and**

2. **Direct staff to undertake additional work as described in this report.**

Vivi Chi, Manager, Transportation Planning introduced Kornel Mucsi, Program Manager, Transportation Strategic Planning who provided a PowerPoint presentation overview of the staff report. A copy of the presentation is held on file with the City Clerk.

The Committee received the following written submission, a copy of which is held on file with the City Clerk:

- Email dated 4 June 2012 from Derek Jackson

The Committee heard from the following public delegations who spoke in opposition to some or all of the four options for light rail transit in the western corridor:

Ian Joiner, McKellar Park Community Association
Bert Titcomb, Byron Avenue Group * (Mr. Titcomb also left a video for circulation to Committee members entitled "Light Rail Panorama – Calgary, Portland and Sacramento")
Sybil Powell *
Helen Waisman
Trevor Jones, Neighbours for Smart Western Rail *
Duncan Retson
Pierre Blais *

David Jeanes, Transport Action spoke specifically to a number of items as they related to the report. *

* Also submitted written comments, which are held on file with the City Clerk

Prior to the item rising to Council, staff were asked to provide the following details:

- The difference in cost as was originally estimated in 2008 vs. what the cost is today
- An estimate of the cost of pursuing the environmental study for the Ottawa River Parkway corridor

The report recommendations were then put to Committee and CARRIED.