Report to
Rapport au:

Transportation Committee
Comité des transports
2 November 2020 / 2 novembre 2020

and Council
et au Conseil
12 November 2020 / 12 novembre 2020

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Ward: Barrhaven (3); College (8); Knoxdale-Merivale (9); and Gloucester-South Nepean (22)

File Number: ACS2020-TSD-PLN-0006

SUBJECT: Barrhaven Light Rail Transit (Baseline Station to Barrhaven Town Centre) and Rail Grade-Separations, Planning and Environmental Assessment Study – Recommendations

OBJET: Étude de planification et d'évaluation environnementale pour le train léger sur rail à Barrhaven (de la station Baseline au centre-ville de Barrhaven) et les sauts-de-mouton - recommandations

REPORT RECOMMENDATIONS

That the Transportation Committee recommend that Council:

1. **Approve the functional design for the Barrhaven Light Rail Transit (Baseline Station to Barrhaven Town Centre) and Rail Grade-Separations Planning and Environmental Assessment (EA) study and interim transit priority measures as described in this report and supporting documents;**

2. **Direct staff to complete the *Transit Project Assessment Process (TPAP) in accordance with the Regulation 231/08* of the *Ontario Environmental Assessment Act*, including the preparation and filing of the Environmental Project Report for final public review and comment; and,**

3. **Direct staff to remove the 1005--1045 Greenbank Road site earmarked for affordable housing by Council on April 10, 2019 (Report ACS2019-PIE-GEN-001) from the list of affordable housing development sites; and,**

4. **Direct the Interdepartmental Task Force on Affordable Housing to undertake a comprehensive review of the planned Stage 3 LRT corridors to identify short-term alternative locations for future affordable housing development to replace the 1005-1045 Greenbank Road site that is now recommended for the Barrhaven LRT's Train Storage and Servicing Facility.**

RECOMMANDATIONS DU RAPPORT

Que le Comité des transports recommande au Conseil de :

1. **Approuver la conception fonctionnelle pour le train léger sur rail à Barrhaven (de la station Baseline jusqu'au centre-ville de Barrhaven), l'étude de planification et d'évaluation environnementale du TLR de Barrhaven et des sauts-de-mouton et les mesures provisoires de priorité au transport en commun, comme décrit dans le présent rapport et les documents à l'appui;**

2. **Charger le personnel de parachever le processus d'évaluation du projet de transport en commun (PEPTC) conformément à la *Loi sur les évaluations environnementales de l'Ontario* et au *Règlement 231/08*, y compris la préparation et le dépôt du rapport environnemental sur le projet aux fins de consultation et d'examen final par le public;**

3. **Charger le personnel de retirer le site situé au 1005 – 1045, chemin Greenbank réservé aux logements abordables par le Conseil le 10 avril 2019 (Rapport ACS2019-PIE-GEN-001) de la liste des emplacements retenus pour l'aménagement de logements abordables;**

4. **Charger le Groupe de travail mixte sur le logement abordable d'entreprendre une analyse exhaustive des couloirs planifiés de l'Étape 3 du TLR afin de répertorier les emplacements possibles de catégorie à court terme pour la construction future de logements abordables afin de remplacer le site situé au 1005 – 1045, chemin Greenbank recommandé présentement pour y aménager l'installation d'entreposage et d'entretien des trains pour le TLR à Barrhaven.**

EXECUTIVE SUMMARY

Assumptions and Analysis

The extension of Light Rail Transit (LRT) to Barrhaven is contemplated in the current Transportation Master Plan (TMP), as part of the Ultimate Rapid Transit and Transit Priority Network, with intended implementation beyond the 2031 horizon year. In 2018, Council directed staff to initiate an Environmental Assessment (EA) study. Completion of the study will bring the Barrhaven area to the same level as other suburban communities in Ottawa with regards to LRT planning, as part of the Stage 3 LRT program.

The study focused on the rapid transit corridor that was protected through the 1997 Southwest Transitway EA study (Baseline Station to Strandherd Drive) and the 2006 Southwest Transitway Extension EA study (Strandherd Drive to Cambrian Road). The study also examined options for implementation staging, a Train Storage and Servicing Facility (TSSF), a new Park and Ride lot, and pedestrian and cycling facilities to support rapid transit service.

The study is being conducted under the *Transit Project Assessment Process (TPAP), Ontario Regulation 231/08* in accordance with the *Ontario Environmental Assessment Act.*

<u>Project Description</u>

- 10 kilometres of twin-track, fully segregated electric LRT;
    - 2.4 kilometres on an elevated structure west of Woodroffe Avenue between

Baseline Station and the Nepean Sportsplex.

- 7.6 kilometres conversion of the existing Southwest Transitway between Nepean Sportsplex and Barrhaven Town Centre, including 1.7 kilometres of an open-cut trench at the southern end of LRT line.

- 7 LRT stations;
  - Three new LRT stations: Tallwood, Knoxdale and Nepean Sportsplex.
  - Conversion of four existing Bus Rapid Transit (BRT) stations to LRT stations: Fallowfield, Longfields, Strandherd and Barrhaven Centre.
- Improved and new facilities for pedestrian and cyclists along the corridor, including a pedestrian bridge connecting to the Nepean Sportsplex;
- Three new bridges over the VIA Rail line at Woodroffe Avenue, the Southwest Transitway and Fallowfield Road;
- Three new below-grade structures at Berrigan Drive, Marketplace Avenue and Chapman Mills Drive;
- A light rail Train Storage and Servicing Facility (TSSF) near the Via Rail overpass at Greenbank Road (1005 and 1045 Greenbank Road);
- A bus-to-rail transfer terminal and 250 spaces park-and-ride facility at the Barrhaven Town Centre; and
- Signalization at Woodroffe Avenue and the entrance to Baseline Station, and the relocation of a northbound bus stop to far-side at Norice Street as interim transit priority measures.

An elevated guideway west of Woodroffe Avenue is recommended as it is less technically complicated and will not create a barrier between communities. The elevated segment is located 40 metres to 60 metres from the homes on Beechcliffe Street.

South of Knoxdale Road, the elevated guideway requires a 20-metre wide strip of land which would affect 120 residential rental units owned by two private companies. The City will continue to inform residents of the project status, including updates to timelines, so that they may be aware of any impacts and can plan accordingly. The City will also work with its affordable housing partners and with private sector developers to encourage them to offer similar housing options on adjacent lands or in nearby

communities.

South of Nepean Sportsplex to Barrhaven Town Centre, the LRT would follow the existing Southwest Transitway corridor, with grade separations over the VIA Rail line. A new signalized intersection at Woodroffe Avenue will provide access to the integrated Fallowfield Station. The Park and Ride at the Barrhaven Centre Station could be integrated with the future development plans for the Barrhaven Town Centre area.

The train storage and servicing facility will be located on City-owned land in the north-east corner of Greenbank-Highbury Park intersection. The location is near the end of the LRT line, which will reduce deadhead train mileage, operating cost and non-revenue service time. The recommended site is currently identified and was approved by Council on April 10, 2019 (ACS2019-PIE-GEN-001) as a short-term site to be retained and developed for the purpose of affordable housing within the next five to seven years. Portions of these lands were also earmarked as having potential for development/disposal by the Ottawa Community Lands Corporation. Staff recommend repurposing the site for the Barrhaven LRT's Train Storage and Servicing Facility and recommend that the Interdepartmental Task Force on Affordable Housing perform a separate comprehensive review of potential short-term sites along Stage 3 LRT corridors to replace the loss of this affordable housing site to LRT use. The review would replicate the process that recommended the original twenty sites along Stage 2 LRT and existing Transitway corridors and staff will report back once a suitable replacement short-term site has been identified. The Interdepartmental Task Force on Affordable Housing is a collaborative effort with staff from: Transportation Services; Planning, Infrastructure and Economic Development; and Community and Social Services.

The functional design drawings for the recommended Barrhaven LRT corridor are shown in Document 1.

Financial Implications

The Class C estimate (2020 dollars) to design and implement the Barrhaven LRT and three rail grade-separations is $3 billion.

The project can be constructed in phases:

- Phase 1: Baseline Station to Fallowfield Station ($2 billion). It includes rail grade-separations (at Woodroffe Avenue, Southwest Transitway and Fallowfield Drive) and the expansion of the maintenance facility at Moodie Drive to initially support

Phase 1 extension.

- Phase 2: Fallowfield Station to Barrhaven Town Centre ($1 billion). It includes the new Train Storage and Servicing Facility.

Rail grade-separations of Woodroffe Avenue, Southwest Transitway and Fallowfield Drive may be undertaken in advance of the LRT extension at an estimated cost of $400 million. This cost is included in the estimate for Phase 1.

The Class C estimate (2020 dollars) to design and implement a new signalized protected intersection at the entrance to the Baseline Station, and the relocation of bus stop at Norice Street, is $2 million. This near-term improvement measure can be funded through the City's transit priority program.

Public Consultation / Input

Consultation with stakeholders occurred through the Agency Consultation Group (ACG), Business Consultation Group (BCG), and Public Consultation Group (PCG). Stakeholders include Indigenous groups, government agencies, Ottawa Housing, National Capital Commission (NCC), VIA Rail, CN Rail, Rideau Valley Conservation Authority (RVCA), City's Accessibility Advisory Committee (AAC), Barrhaven Business Improvement Area (BIA), developers, landowners, business groups, school boards, community associations and special interest groups. Consultation with the general public occurred primarily through two open houses and through the project webpage, e-mail, and additional meetings as required, such as with affected property owners. A project website (www.ottawa.ca/barrhavenlrt) was established to share information on the study's progress.

Major feedback includes: support for advancing the project; impact on rental housing units; noise and visual impacts from the elevated facility; avoiding traffic impacts to Woodroffe Avenue during and post construction; support for pedestrian and cycling facilities; making use of the space under the guideway; providing more parking; support for grade separations at the VIA rail crossings; limiting impacts on the NCC Greenbelt and green spaces; and, impact on water quality.

These issues were assessed during the development of recommended plan and are described in this report.

BACKGROUND

In 1997, the former Region of Ottawa-Carleton completed an environmental

assessment (EA) for extension of Southwest Transitway from Baseline Station to Strandherd Drive. The EA study recommended a bus rapid transit (BRT) corridor that included a cut-and-cover section under Woodroffe Avenue southbound lanes between Knoxdale Road and Hunt Club Road.

In 2006, the City completed the Southwest Transitway Extension EA study from Strandherd Drive to Cambrian Road.

Reserved bus lanes along Woodroffe Avenue between Baseline Station (College Avenue) and the Nepean Sportsplex were implemented between 1997 and 2001. The segregated Southwest Transitway between the Nepean Sportsplex and Barrhaven Town Centre was constructed between 2005 and 2009.

This EA study examined how LRT can be extended to Barrhaven, including the VIA Rail grade separations near the Fallowfield Station and park-and-ride lot.

DISCUSSION

Study Area

Figure 1 shows the study area that extends from Baseline Station in the north to Barrhaven Town Centre in the south.

The areas around Baseline Station and Barrhaven Town Centre are designated in the Official Plan as Mixed Use Centre/Town Centre. The study area north of Hunt Club Road and south of Fallowfield Road is designated as General Urban Area.

The corridor crosses the NCC Greenbelt between Hunt Club Road and Fallowfield Road. Land uses inside the Greenbelt include Major Open Space, Agriculture Resource Area, Natural Environment Area, Greenbelt Rural, Greenbelt Employment and Institutional Area.

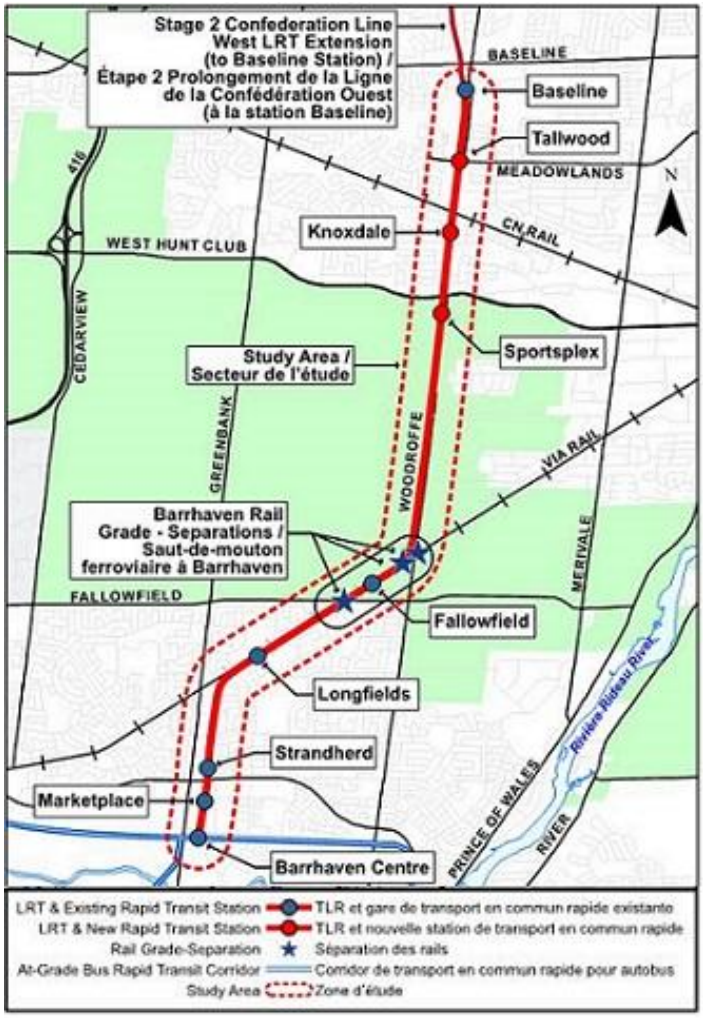


Figure 1: Study Area

Project Need

<u>LRT Extension:</u>

As part of the 2013 TMP, future (2031) transit ridership projections were developed based on the proposed affordable rapid transit network. This model was further refined as part of the Stage 2 LRT project. The model indicates an existing (2011) transit demand of 5,900 two-way trips along the Southwest Transitway crossing the Greenbelt screenline during the weekday morning peak period. This demand is estimated to increase to 9,750 by 2031. Extension of LRT to Barrhaven would generate approximately 1,400 additional trips during the same period.

The Barrhaven LRT corridor will connect two major areas of the planned growth - the Barrhaven Town Centre and Centrepointe Town Centre. Both are designated for future

intensification and development as mixed-use centres. It will also connect Barrhaven directly with downtown and allow connections to many other destinations and transit corridors across the city.

Train Storage and Servicing Facility (TSSF):

The EA study examined the requirement of a TSSF to support the proposed extension of Barrhaven LRT. The analysis undertaken reviewed the future fleet requirements for the Stage 1 and Stage 2 LRT projects and the work done as part of the Kanata LRT EA Study.

Consultation with O-Train Planning and OC Transpo staff concluded that the Belfast and Moodie facilities together will have sufficient capacity to provide for heavy maintenance (e.g. overhaul, major repair) of Light Rail Vehicles (LRV's) for an expanded LRT network to Kanata and Barrhaven. However, the Barrhaven LRT extension will require a TSSF for overnight storage of trains, daily cleaning, inspection and minor repairs.

It was determined that a TSSF would need to accommodate 16 LRV's (eight double trains). A location near the end of the line would reduce deadhead train mileage, operating cost and the track access window required to perform inspection and servicing activities overnight, when revenue service is not operating.

Planning and Design Considerations

The EA process involved developing and evaluating alternatives that considered all aspects of the surrounding environment, including social, natural, physical and economic conditions.

The study has two distinct sections:

- Section 1: Baseline Station to Nepean Sportsplex. This 2.4 kilometres section requires the development of an alignment for the LRT.
- Section 2: Nepean Sportsplex to Barrhaven Town Centre. This 7.6 kilometres section is the conversion of the existing Transitway to LRT.

Several planning and design considerations were taken into account when developing and evaluating design alternatives. These included reviewing the approved 1997 EA plan in light of the change to LRT technology and new information on background geotechnical conditions; addressing all modes of transportation operations during and after construction; community and underground infrastructure impacts; and, capital and

operating costs. The following three key design considerations emerged during the analysis that influenced the project outcome:

1) Design Compatibility with the Confederation Line:

As an extension of the Confederation Line, this project must employ the same design standards for a fully segregated corridor with the same operational and safety requirements as the rest of the network. This requires the Barrhaven LRT to be grade-separated at intersections.

The close spacing between the streets and the CN Rail line that cross the corridor, along with the allowable design grade for the LRT, do not provide the opportunity to combine underpasses and overpasses solutions along the line. Therefore, the configuration (either below-grade or elevated) must be continuous for the entire 2.4 kilometres length from Baseline Station to the Nepean Sportsplex.

2) Geotechnical Conditions:

The geotechnical investigations indicate that north of Barrhaven, beneath a thin layer of topsoil and fill, are layers of sensitive marine clay and permeable materials including sand, silts and glacial till of varying thicknesses that extend down to the underlying bedrock up to 25 metres below the ground surface. The existing water table is very high, in some places extending up into the clay layer. The construction of any below-grade facility in this area would need to be designed to prevent any lowering of the surrounding groundwater level. Otherwise, it could result in the settlement of homes or buildings up to 250 metres on either side of the LRT alignment.

3) Limited Right-of-Way between Knoxdale and West Hunt Club Roads:

As part of the 1997 Southwest Transitway EA, a corridor on the west side of Woodroffe Avenue between Baseline Station and Knoxdale Road was protected to allow for the eventual construction of segregated Southwest Transitway through this area. Between Knoxdale Road and the Nepean Sportsplex, the 1997 Southwest Transitway EA located the future BRT transitway extension in a cut-and-cover tunnel under the southbound lanes of Woodroffe Avenue. Figure 2 shows the constrained right-of-way between Knoxdale Road and West Hunt Club Road.

Figure 2: Constrained Right-of-way between Knoxdale and West Hunt Club Roads

Corridor Alignment and Design Alternatives

Section 1: Baseline Station to Nepean Sportsplex

Given the results of the preliminary geotechnical investigations and the other two key design considerations, a total of eight alternatives for the Baseline Station to Nepean Sportsplex section were developed for evaluation. These included below-grade and elevated options, within and west of the Woodroffe Avenue right-of-way, as well as the cut-and-cover solution as proposed in 1997.

Two alternatives were screened out early in the study process. One alternative was to locate the LRT on the east side of Woodroffe Avenue. This was screened out as it was not compatible with the corridor to the north and south; would limit space for active transportation facilities; would conflict with existing Hydro infrastructure; and significantly disrupt transit and traffic operations during construction. The second alternative was to locate the LRT in a bored tunnel. Both shallow and deep tunnels were investigated. Although a bored tunnel solution would in theory address the issue of water table draw down, the geotechnical investigations indicated that a shallow bored tunnel (above the bedrock level) would conflict with major underground utilities, require specialized tunneling techniques and carry significant risk of ground collapse (i.e. sinkholes)

occurring during construction. A deep bored tunnel within the bedrock layer would be extremely deep (comparable to Rideau Station on the Stage 1 Confederation Line), increasing costs substantially particularly for the stations. In either case, the economics of using a tunnel boring machine suggested that the entire 2.4 kilometres segment would need to be tunneled, which is considered unnecessary given that for most of the route lands are already protected for the rapid transit corridor as part of the 1997 Southwest Transitway EA. Therefore, the bored tunnel option was also screened out.

The remaining six alternatives (Figure 3) were carried forward for further evaluation. These included both below grade and elevated alternatives within or west of the Woodroffe Avenue right-of-way. Four alternatives were identified within the Woodroffe Avenue right-of-way; and two to the west of existing right-of-way. Although there are serious geotechnical concerns, the below grade options were carried forward for completeness of the evaluation process.

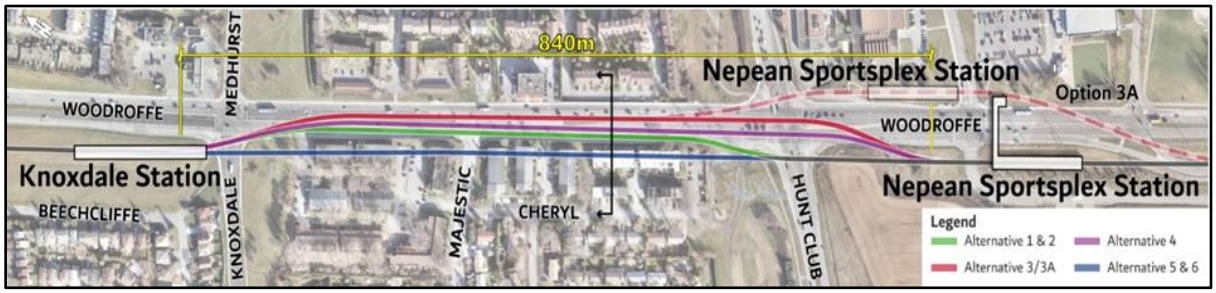


Figure 3: Corridor/Alignment Options

These alternatives are described as follows:

- Alternatives 1 and 2 are below-grade located within the Woodroffe Avenue right-of-way. Alternative 1 locates the LRT in a cut-and-cover tunnel running under the southbound lanes. This provides the opportunity to renew Woodroffe Avenue as a ‘Complete Street’. Alternative 2 locates the LRT in an open trench on the west side of Woodroffe Avenue. The trench requires a permanent reduction in roadway capacity with insufficient space available to renew Woodroffe Avenue as a ‘Complete Street’.

- Alternatives 3 & 4 are elevated, located within the Woodroffe Avenue right-of-way. Both alternatives provide the opportunity to shift the alignment to the east side of Woodroffe Avenue south of West Hunt Club Road to permit locating a station on the same side as the Nepean Sportsplex. Alternative 3 is elevated within the median while Alternative 4 is on the west side of the Woodroffe Avenue right-of-way.

- Alternatives 5 & 6 maintain a continuous, straight track geometry throughout the corridor and are consistent with the approved plan to the north and south. As such, the alternatives are located beyond the Woodroffe Avenue right-of-way, on the west side, directly affecting a number of residential rental properties. Alternative 5 is a below-grade trench while Alternative 6 is an elevated guideway.

Evaluation of Alternatives:

The evaluation of alternatives was subject to a process that considered a broad list of criteria responding to all aspects of the environmental sustainability, including: Transportation System, NCC Greenbelt, Ecological and Physical, Land Use and Community and Economic.

Given the challenging geotechnical conditions in the study area, it was confirmed that construction of any below-grade LRT facility would extend into the permeable sands lying beneath the sensitive marine clay layer. Furthermore, the bottom of the below-grade facility would be several metres below the existing groundwater (Figure 4). Therefore, the facility needs to be designed to prevent any lowering of the surrounding groundwater level. Otherwise, it would impact the clay layer above, and potentially result in settlement of surrounding infrastructure.

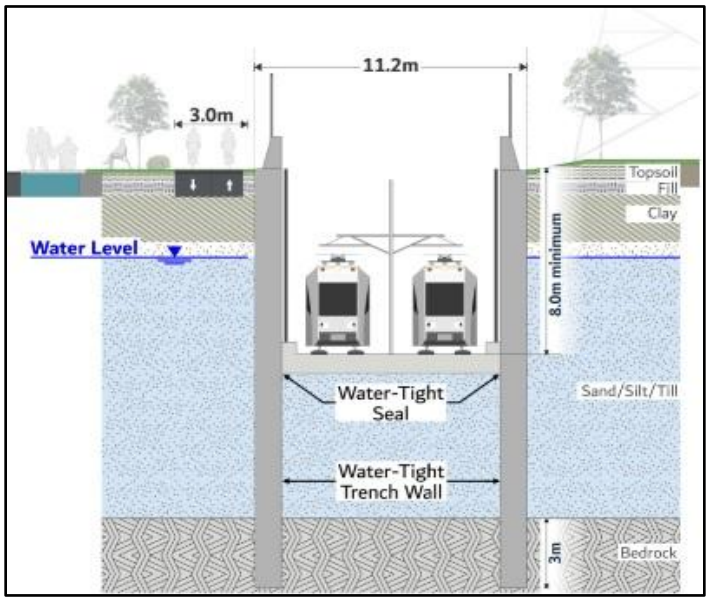


Figure 4: Geotechnical conditions in the study area

A GIS-based analysis demonstrates that lowering of groundwater level could potentially impact over 640 homes; over 40 commercial, institutional or business buildings; roads and underground utility lines.

To prevent permanent lowering of the groundwater, water-tight construction methods are required, as shown in Figure 4, which are both complex and expensive to build. Maintaining the integrity of a continuous 2.4-kilometre long water-tight structure over the life of the facility would be a significant challenge. Any leaks would be very difficult and costly to repair. Even small leaks can result in groundwater lowering that may take place over many years, resulting in building damage years after the LRT construction.

Additionally, several major underground utilities cross the Barrhaven LRT corridor, including large storm and sanitary sewers and many smaller sewers and watermains. Enbridge Gas have plans to extend a major east-west gas distribution main north of West Hunt Club Road.

The continuous water-tight walls of a below-grade trench would effectively cut-off these utility lines, as shown in Figure 5. Each utility line will require a unique solution depending on a variety of factors. Some of the smaller ones may be able to be punched through the trench walls (below the LRT) passing through a water-tight sleeve. However, some would require significant and costly relocations to connect elsewhere. As the storm and sanitary sewers in the study area are all gravity-based, some form of pumped solution would be required for any sewer that crosses under the LRT base slab.

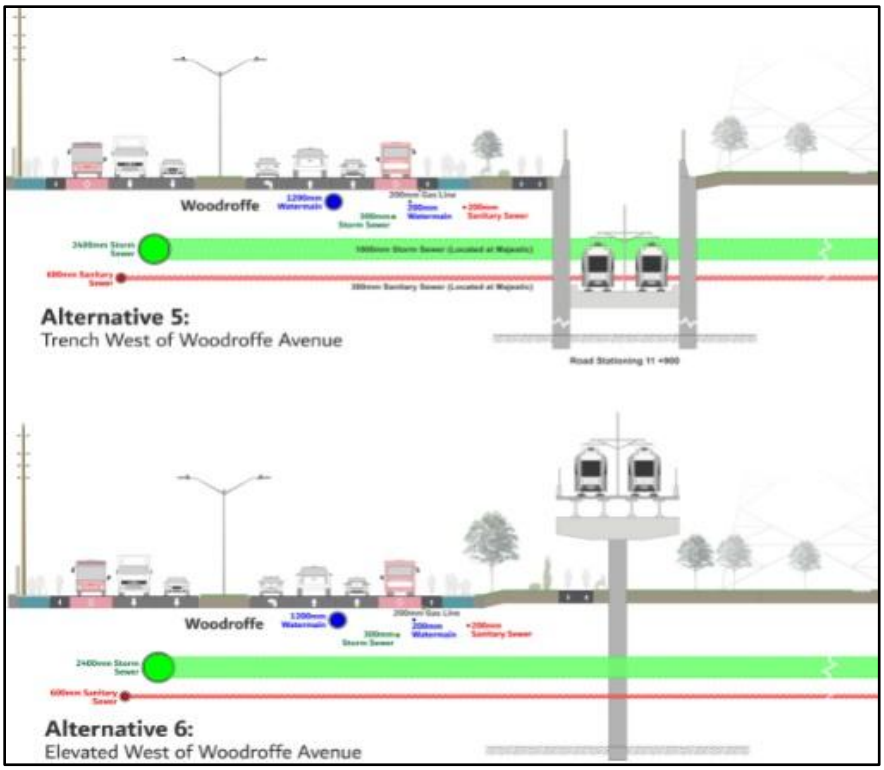
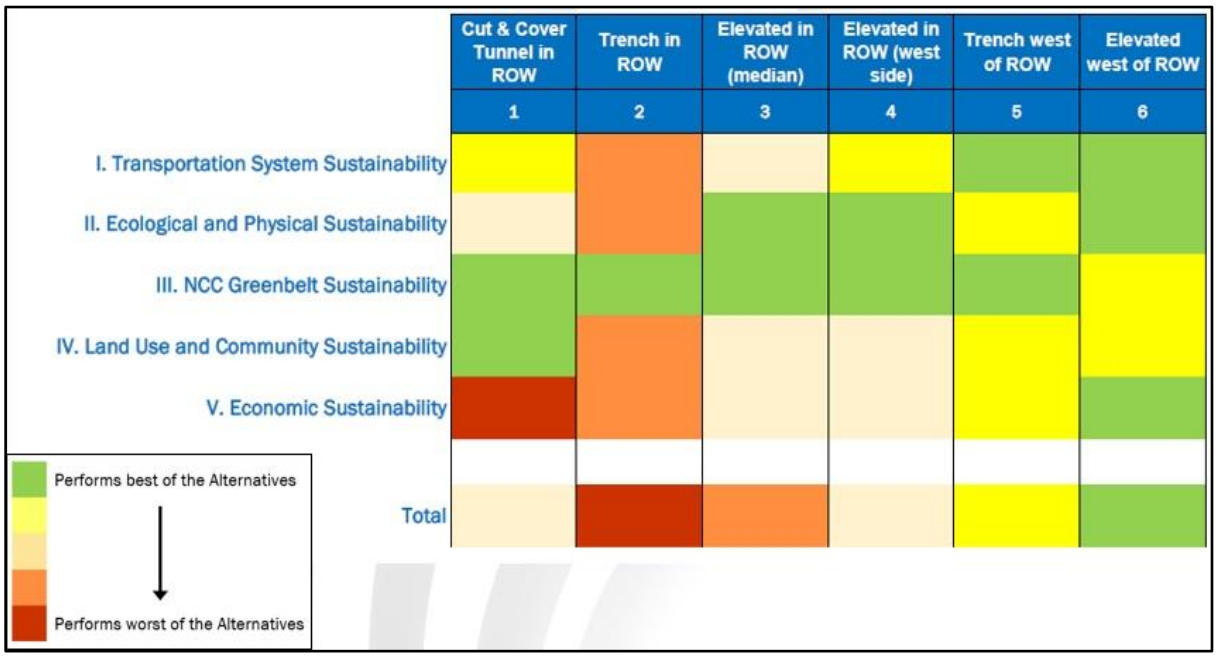


Figure 5: Underground Utilities and Below-Grade and Elevated Alternatives

The study concluded that the below-grade options are risky (geotechnical instability and high-water table, utilities), would take longer to construct and are more expensive to build.

The summary of the evaluation results is shown in Table 1.

Table 1: Summary of Evaluation Results



A total of 13 criteria and 35 indicators were used for the evaluation of the six alternatives. Impact on residential properties was considered as an indicator under the Land Use and Community Sustainability (Category IV) of Table 1. A detailed evaluation of the six alternatives is provided in Section 1-1, Table 1-2 of Document 2.

<u>Recommended Alternative (Alternative 6):</u>

The elevated alternative (Figure 6) avoids geotechnical risks and avoids conflicts with underground utilities crossing the corridor. It is less technically complicated to build than the below-grade alternatives. The elevated alternative will not limit the overall connectivity to or from the adjacent communities to the facility, adjacent pathways or sidewalks, or require additional crossing structures. It provides opportunities to animate, program or landscape the space underneath, including a new multi-use pathway along the corridor. Any visual and potential noise impacts associated with the elevated alternative can be mitigated using best practices and will be identified in the Environmental Project Report.

West of Woodroffe Avenue is the shortest and straightest alignment. It avoids impacts

to Woodroffe Avenue both during and after construction. It eliminates curves that increase wheel noise and passenger discomfort and results in higher vehicle and track maintenance costs. This alignment optimizes station locations, reduces impact on traffic and improves sight lines at intersections.

The recommended alignment affects 120 private residential rental units. The impact is further described under the “Property Requirements” section of this report.

The existing dedicated bus lanes on Woodroffe Avenue north of Nepean Sportsplex will still be required following the completion of the Barrhaven LRT extension to ensure the reliability of transit service for the bus routes that will bring transit customers from adjacent communities to LRT stations along Woodroffe Avenue.

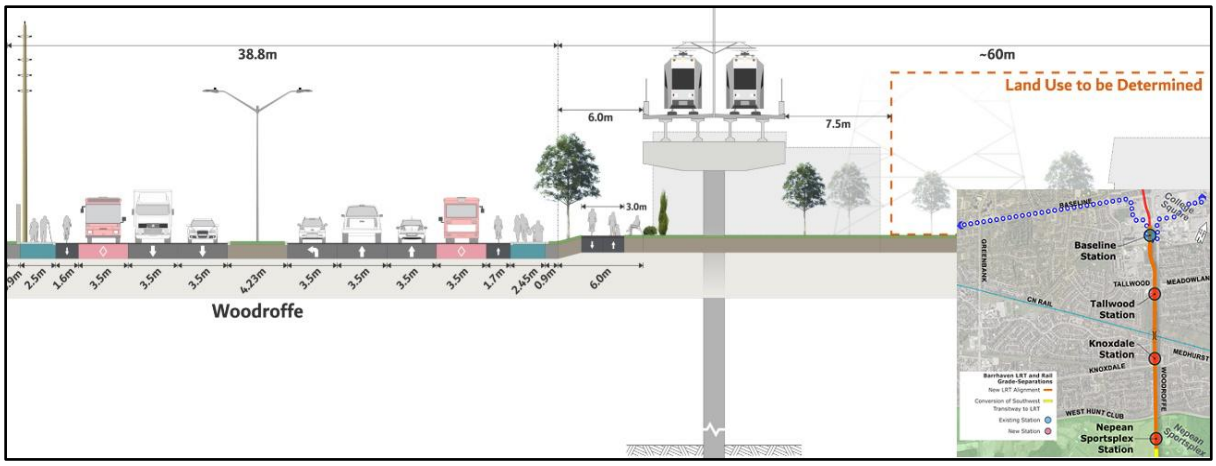


Figure 6: Preferred Alternative for Baseline Station to Nepean Sportsplex section

Section 2: Nepean Sportsplex to Barrhaven Town Centre

South of the Nepean Sportsplex, the elevated LRT guideway will transition back to grade and follow the alignment of the existing Southwest Transitway to Barrhaven Town Centre. As it passes through the NCC Greenbelt, it stays along the west side of Woodroffe Avenue. This section requires conversion of the existing 7.6-kilometre Transitway to LRT, with three new rail grade-separation structures for Woodroffe Avenue, the Southwest Transitway and Fallowfield Road where these corridors currently cross the existing VIA Rail tracks at-grade. The structures were designed to minimize their overall footprint on the NCC Greenbelt lands.

The LRT would also include new underpasses at Berrigan Drive, Marketplace Avenue and Chapman Mills Drive.

<u>Train Storage and Servicing Facility (TSSF):</u>

Due to the long distance between Barrhaven Centre and the maintenance and storage facilities at Belfast Road and Moodie Drive, it was concluded that an additional storage facility in the corridor would enable more efficient and cost-effective LRT operations by reducing non-revenue train movement, allowing more time at night for daily inspections and track maintenance activities. This nearby facility would provide the flexibility to scale service up or down at the beginning or end of the peak service times.

Given the scale and role of the facility, a site located directly adjacent to the LRT corridor near the end of the line is vital. The TSSF requires a site that has secure access and is large enough to accommodate eight trains and provide for mid-day and overnight storage. Six potential sites were evaluated as shown in Figure 7.

Alternatives					
1	2	3	4	5	6
Baseline Station	Woodroffe Open Space	Slack Road	Fallowfield	Greenbank	Barrhaven

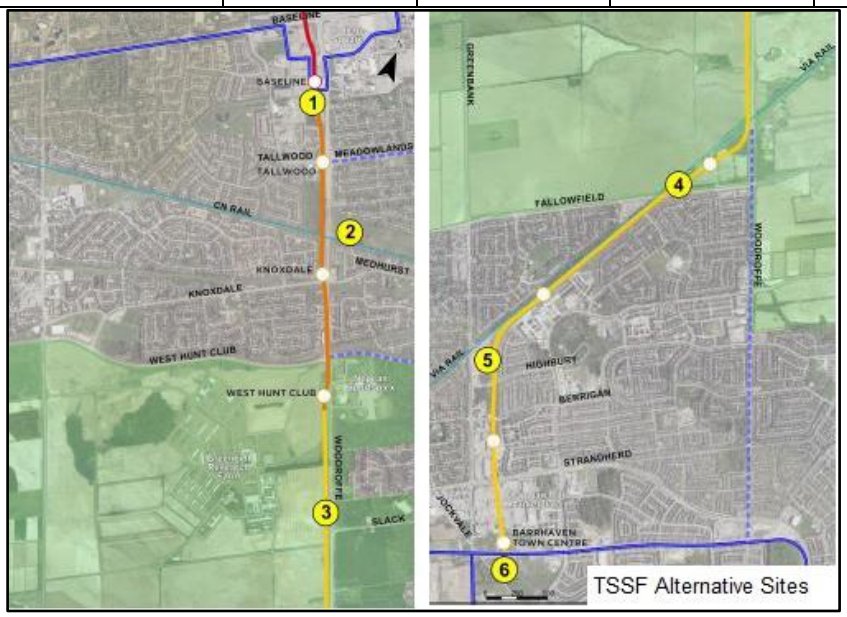


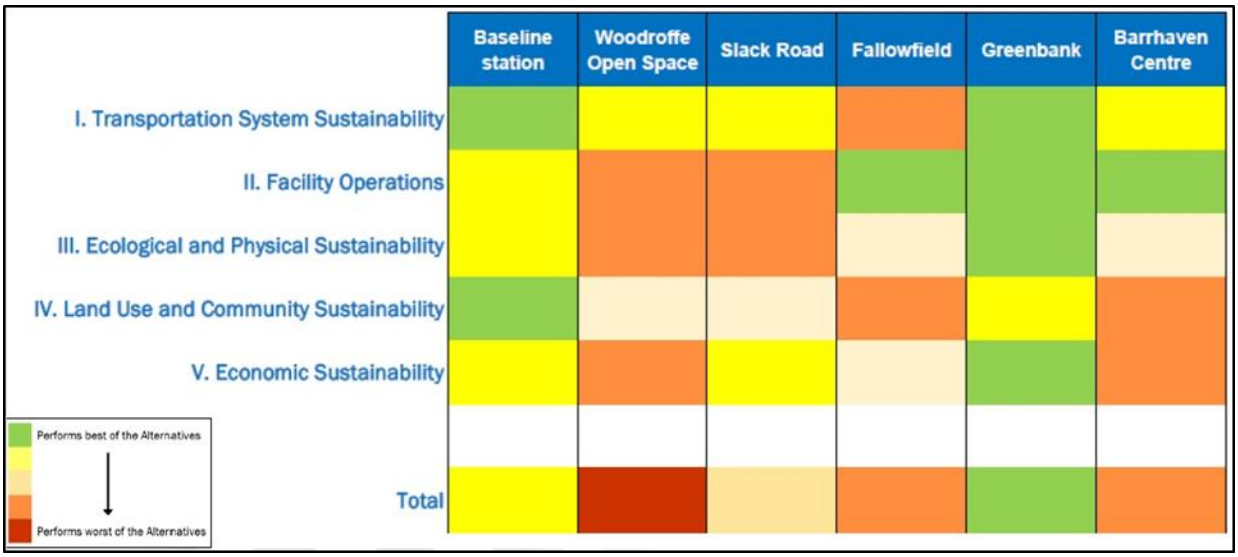
Figure 7: TSSF Site Alternatives

Alternative 5 (Greenbank) is recommended for the TSSF site. This site is located near the end of the line and is adjacent to the LRT corridor, which is optimal for operations. The site is buffered from the existing residential land uses to the west by Greenbank Road and to the east by the LRT corridor (existing Southwest Transitway) and a vegetated/treed multi-use pathway. This site is City-owned.

The other sites have constraints, including: high cost to construct; challenging compatibility with LRT alignment; incompatibility with future land use; requirement for land acquisition; and not optimal for LRT operations.

Table 2 provides a summary of evaluation results. Details of the evaluation are provided in Section 1-1, Table 1-3 of Document 2.

Table 2: Summary of Evaluation Results (TSSF)



The recommended site is identified as one of 20 sites approved by Council (April 10, 2019), for future Affordable Housing projects. Staff recommend a separate comprehensive review of potential sites along Stage 3 LRT corridors to mitigate the loss of this affordable housing site to LRT use. This review will replicate the process that recommended the original twenty sites along Stage 2 LRT and existing Transitway corridors. It will be a collaborative effort with staff from: Transportation Services; Planning, Infrastructure and Economic Development; and Community and Social Services. Portions of these lands were also earmarked as having potential for development/disposal by the Ottawa Community Lands Corporation.

Recommended Plan

Section 1: Baseline Station to Nepean Sportsplex

The Barrhaven LRT extension will start at the Baseline Station, which is also the terminus of Stage 2 LRT. This begins in a below-grade open trench south of College Avenue. The LRT alignment then shifts slightly easterly and begins to rise out of the open trench onto an elevated guideway (Figure 8) where it runs parallel to and west of

Woodroffe Avenue. The LRT continues southerly before crossing over Tallwood Avenue and entering Tallwood Station.

Figure 8: Elevated Alignment Concept. The vacant land adjacent to the Knoxdale Station is city-owned zoned as residential.

Tallwood Station:

Tallwood Station (Figure 9) will be located on the southwest corner of the Woodroffe/Tallwood/Meadowlands intersection, with the station entrance and platforms located south of Tallwood Avenue. A station entrance building will provide access from street level, with stairs, escalators and elevators provided to connect to the elevated LRT station platforms. Connections to local bus routes on Woodroffe, Tallwood and Meadowlands would be via on-street stops.

Figure 9: Tallwood Station Rendering (Looking southwest)

South of Tallwood Station, the LRT alignment remains elevated along the west side of Woodroffe Avenue, in the open corridor that had been protected for future rapid transit use since 1997. South of Tallwood Station (approx. 550 metres), the LRT line crosses over the CN Rail corridor. The elevated alignment provides an opportunity for a linear multi-use pathway beneath the structure.

Knoxdale Station:

Knoxdale Station (Figure 10) is 780 metres south of Tallwood Station, on the northwest corner of the Woodroffe/Knoxdale intersection, with the station entrance and platforms located north of Knoxdale Avenue. A station entrance building will provide access from street level, with stairs, escalators and elevators provided to connect to the elevated LRT station platforms. A small public plaza will be created at the station entrance, extending to the adjacent Woodroffe/Knoxdale intersection and providing opportunities for landscaping and public art.

South from Knoxdale Station, the elevated LRT alignment will affect three existing residential properties located west of Woodroffe Avenue between Knoxdale Avenue and West Hunt Club Road. Approximately, a 20-metre wide strip of land is required from these properties to accommodate the LRT guideway and maintain sufficient setbacks to allow for future maintenance and inspection of the structure. These properties contain 205 rental units. At this time, staff estimate approximately 85 units could be saved. As part of the EA study, a concept plan was developed to demonstrate that the redevelopment of left-over land parcels could result in a similar number of residential units as before. The project also offers a unique opportunity to redevelop these properties that are more compatible with LRT investments. There are also surplus City-owned lands near the proposed Knoxdale Station that can also be used for transit-oriented development.

At West Hunt Club Road, the elevated LRT alignment remains on the west side of Woodroffe Avenue where it enters the NCC Greenbelt area.

Figure 10: Knoxdale Station Rendering (Looking southeast). The vacant land adjacent to the Knoxdale Station is city-owned zoned as residential.

Nepean Sportsplex Station:

Nepean Sportsplex Station (Figure 11) is located 950 metres south from Knoxdale Station, on the west side of Woodroffe Avenue and between the two signalized intersections, which provide access to the Nepean Sportsplex and NCC Greenbelt lands. The station will be connected to the Sportsplex via a pedestrian bridge with elevators and stairs on the west (station) side and ramps on the east (Sportsplex) side. The planned parallel multi use pathway facility alongside the LRT alignment will switch from the west side of Woodroffe to east side at the northerly signalized intersection and connect with the existing NCC multi use pathway which runs along the east side of Woodroffe Avenue to Fallowfield Road and into Barrhaven. Connections to local bus routes remaining on Woodroffe Avenue will be on-street.

Figure 11: Nepean Sportsplex Station Rendering (Looking southwest)

Section 2: Nepean Sportsplex to Barrhaven Town Centre

South of the Nepean Sportsplex Station, the LRT alignment returns to at-grade to run across the NCC Greenbelt area along the existing Southwest Transitway alignment (Figure 12).

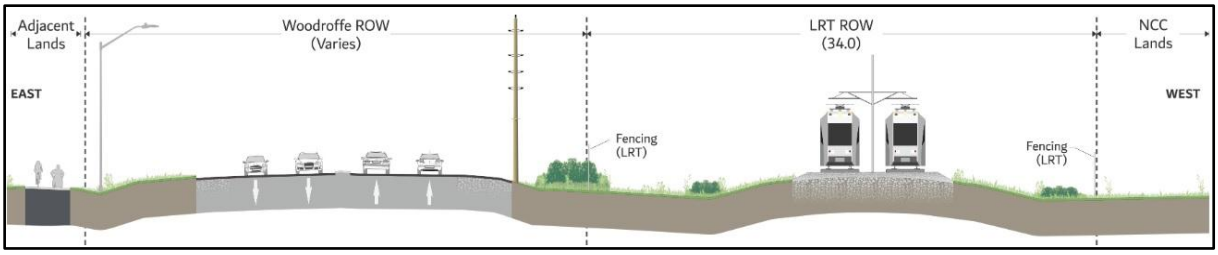


Figure 12: LRT through the Greenbelt area

The existing accesses to the adjoining properties and multi-use pathway networks within the Greenbelt are maintained and can accommodate a future connection to the NCC's proposed Black Rapids Creek pathway. With respect to the natural environment, nearby wetlands were taken into account and two new eco-crossings are included in the recommended plan to permit the passage of fish, small mammals, larger terrestrial wildlife and birds.

The study recommendations include enhancing the culvert for the southern tributary of Black Rapids Creek, which will need to be extended as part of the project. These enhancements will include the placement of substrate material, installation of "critter

shelves” to allow for the passage of small terrestrial animals, and provision for open sections or skylights in the median to allow for light penetration into the culvert. An additional wildlife crossing is naturally created under the Woodroffe Avenue and LRT overpasses which will accommodate birds and larger wildlife.

Temporary and permanent impacts to NCC Greenbelt lands will result, which will require mitigation as described in the Environmental Implications section of this report.

Fallowfield Station:

Fallowfield Station (Figure 13) is located 3.4 kilometres south from Nepean Sportsplex Station. The alignment and station will be elevated to maintain access to the existing VIA Rail Fallowfield Station, immediately to the north of the LRT facility. Although currently planned as two separate station facilities, as VIA Rail develops plans for its High Frequency Rail (HFR) project, the opportunity to develop a single, integrated station facility serving both VIA Rail and OC Transpo services could be considered.

Southwest of Fallowfield Station, the LRT alignment will continue along the existing Transitway, crossing under the new Fallowfield Road rail grade-separation, which will span both the LRT and VIA Rail corridors. A pocket track will be provided in this area for temporary train storage and reversing of trains at Fallowfield Station as an intermediate turnback point.

Southwest of Fallowfield Road, the alignment continues at-grade in the Transitway corridor.

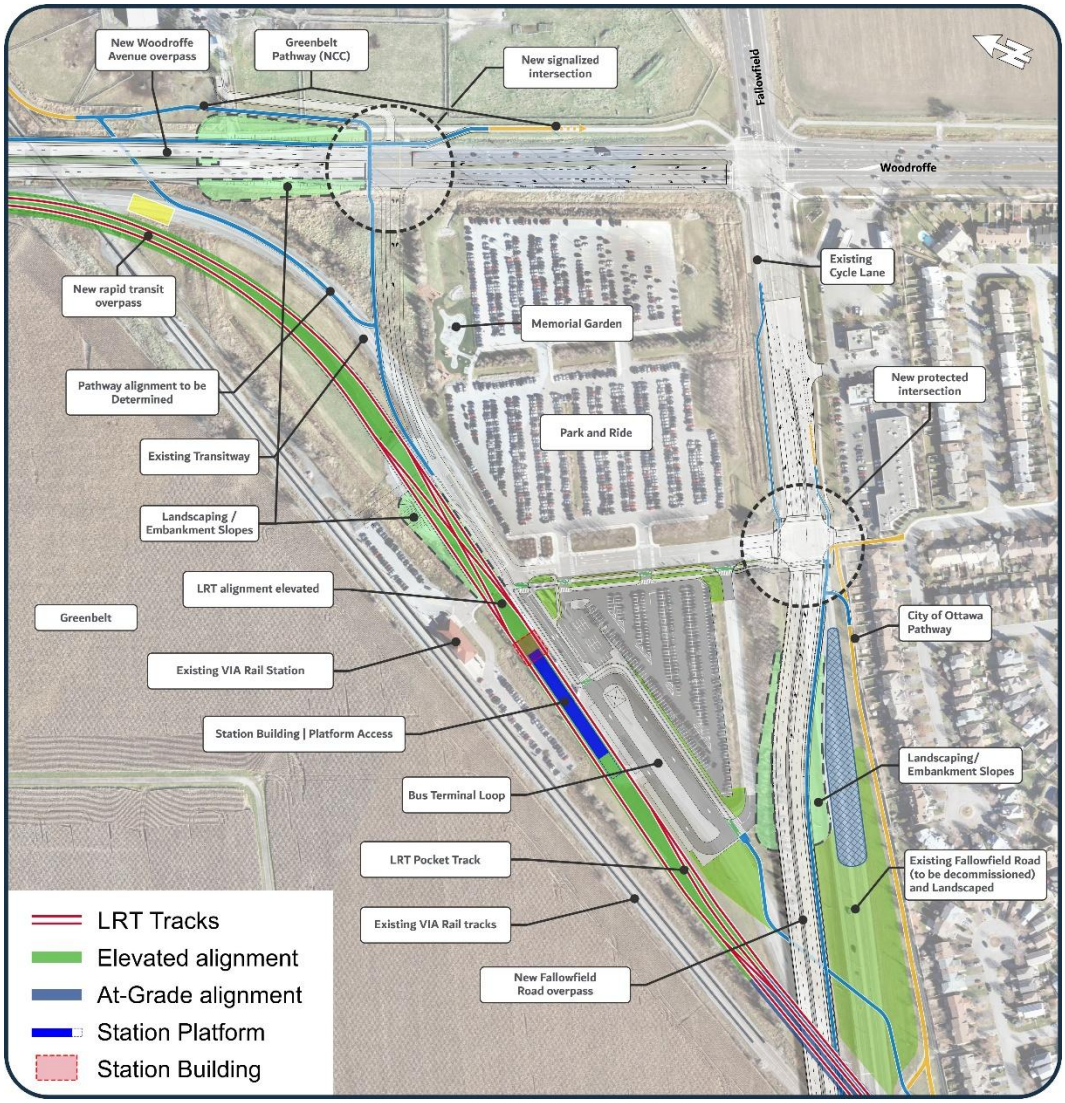


Figure 13: Fallowfield Station

Integration with existing Fallowfield Park and Ride:

The recommended plan includes a new signalized intersection at Woodroffe Avenue. This new roadway access will ease pressure/congestion at the existing Fallowfield/Park and Ride access and support potential bus access. It will also provide pedestrians and cyclists a safe crossing between the Fallowfield Park and Ride site and the multi-use pathway on the east side of Woodroffe Avenue. Other features include a new off-street bus terminal allowing fare paid connections between buses and LRT, a bus lay-up area, bus operator facilities and a new passenger pickup and drop off facility adjacent to the bus terminal. The recommended plan also provides new pathway connections to the station and separate pedestrian and cycling facilities through the station zone to reduce conflicts.

Longfields Station:

Longfields Station (Figure 14) is located approximately 1.6 kilometres southwest from Fallowfield Station. The existing Transitway station will be converted to an LRT station. A side platform configuration is proposed to make use of existing stairs and elevators at the station. The lower level will need to be enlarged to accommodate space for ticket vending machines, additional elevators, faregates and service rooms. The existing multi-use pathway which passes through the station on the lower level providing connections from both the north and south sides of the rapid transit/VIA Rail corridor will be maintained.

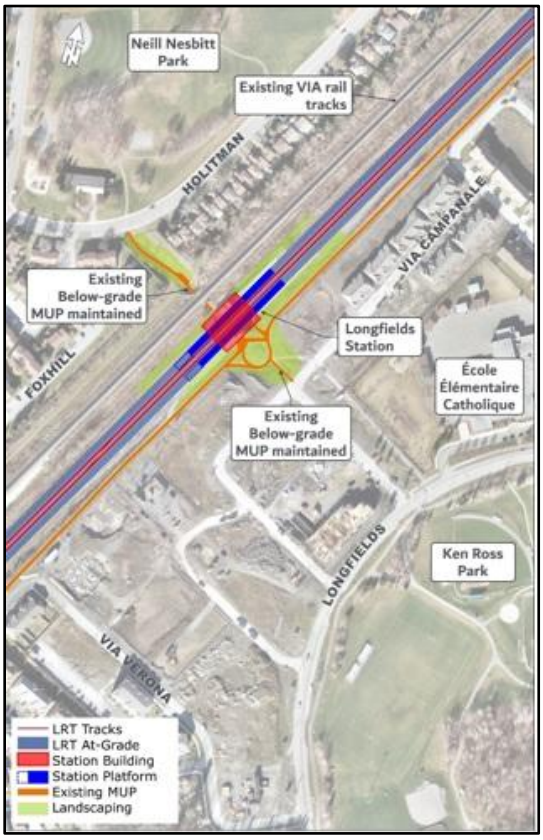


Figure 14: Longfields Station

Southwest from Longfields Station the LRT alignment will continue in the Transitway corridor. East of Greenbank Road the corridor curves to the south. On the west side of the corridor - on lands bounded by Highbury Park Road, Greenbank Road, the VIA Rail corridor and the LRT corridor - a Train Storage and Servicing Facility (TSSF) will be located.

South of the existing Highbury Park Road underpass, the existing at-grade rapid transit

corridor will be modified as part of the conversion to LRT to become a below-grade open trench. This will permit grade-separation at Berrigan Drive, with the LRT passing under the roadway before entering Strandherd Station.

Strandherd Station:

Strandherd Station (Figure 15) is located 1.4 kilometres south-west from Longfields Station. The below-grade open trench alignment will continue through the station area to match up with the existing underpass at Strandherd Drive, 230 metres south. A centre platform configuration is proposed, with vertical circulation (stairs, escalators and elevators) providing platform access from a station house located at-grade and on a structure spanning over the tracks. This structure would also serve as a through-link for pedestrian and cycling movement over the LRT, replacing the existing at-grade crossing of the Transitway.

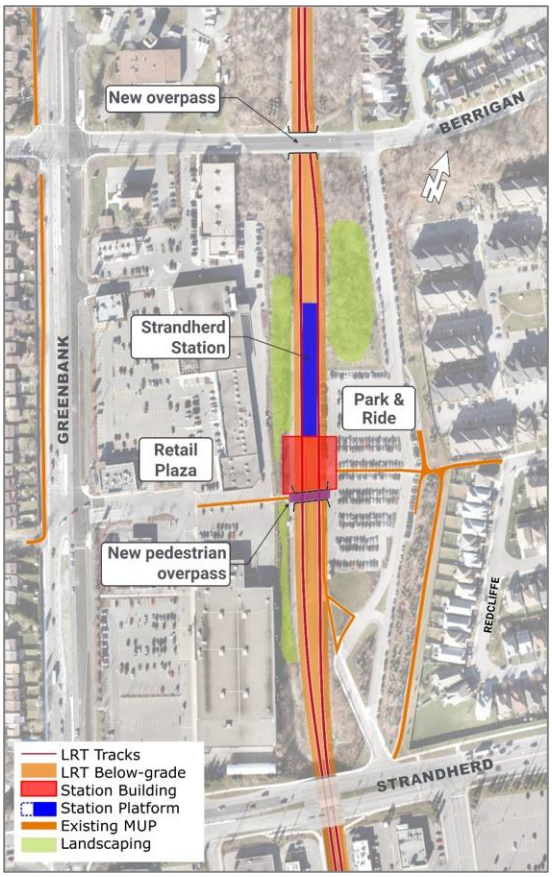


Figure 15: Strandherd Station

The existing Park and Ride lot, including passenger pick-up and drop-off facility, will be integrated, with only minor modifications needed to improve access for all modes.

South of Strandherd Station, the LRT alignment remains in a below-grade open trench, crossing under Strandherd Drive via the existing Transitway underpass. The open trench will be extended further south to cross under Marketplace Avenue. The existing Marketplace Station will be decommissioned and consolidated with a relocated and expanded Barrhaven Centre Station. The existing internal access road located approximately 100 metres south of Marketplace Avenue will be grade-separated (LRT under the roadway) and the LRT alignment will enter into the terminus at Barrhaven Centre Station.

Barrhaven Centre Station:

Barrhaven Centre Station (Figure 16) is located 780 metres south from Strandherd Station and will be below-grade located in the general area of the existing Barrhaven Centre Transitway Station. As part of the conversion to LRT, the rapid transit alignment will diverge from the existing Transitway at a point approximately 160 metres south of Marketplace Avenue and continue straight towards Chapman Mills Drive to provide sufficient tangent length for LRT platforms. A new off-street bus terminal is located west of the LRT platforms on lands currently occupied by the Transitway.

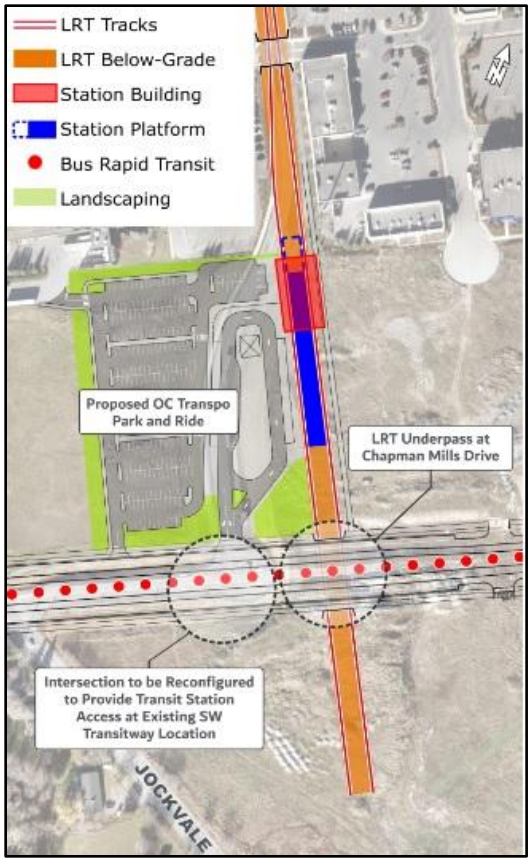


Figure 16: Barrhaven Town Centre Station

A new Park and Ride lot (250 spaces) will be provided initially on lands identified west of the existing Southwest Transitway. Ultimately, this facility could be integrated with the proposed “Civic Complex” to be located in the Barrhaven Town Centre area and incorporating the future Barrhaven Centre LRT Station. The Park and Ride lot is designed to support the existing Southwest Transitway as well as phased implementation of the future rapid transit network in the area.

Tail-tracks will be provided beyond the LRT station platforms to permit temporary storage of trains during revenue operations. The LRT alignment will extend south of Chapman Mills Drive approximately 80 metres to provide sufficient length for a tail track. A new grade-separated structure (LRT under the roadway) will be constructed at Chapman Mills Drive to accommodate the tail track.

Rail Grade-Separations with VIA Rail

Woodroffe Avenue and Southwest Transitway Overpasses:

The Woodroffe Avenue and Southwest Transitway overpasses will be separate bridge structures. The Woodroffe Avenue bridge will have two traffic lanes in each direction. The existing at-grade VIA crossing of the NCC multi-use pathway on the east side of Woodroffe Avenue will be relocated to the east of the overpass structure and the embankment with connections provided to the existing network.

The grade-separation of the Southwest Transitway will be designed to accommodate construction either as a BRT or LRT facility, if the grade-separations at VIA Rail proceed in advance of the LRT implementation.

Figure 17: Woodroffe Avenue and Southwest Transitway overpasses (Looking southwest)

Figure 17 shows the Woodroffe Avenue overpass on the east side, while the LRT overpass is shown to the west. The open median on the Woodroffe structure will allow light to penetrate below to the multi-use pathway which will serve as a link to connect the multi-use pathways (north of VIA Rail line) on the east and west sides of the overpass structures. This link has taken into account the future NCC's Black Rapid's Creek recreational path.

A new signalized intersection will provide access to the integrated Fallowfield Station and to the relocated Royale Equestrian Centre entrance (Figure 18). Current parking for events at the Centre is on Woodroffe Avenue, however, with the grade-separations with the VIA Rail corridor, on-road parking will no longer be possible. Parking will need to be on site at the Centre.

Figure 18: New Access for Fallowfield Park and Ride at Woodroffe Avenue

The overpass structures provide the opportunity to create an eco-crossing for wildlife movements and connections within the Black Rapids Creek vicinity and to maintain or enhance natural habitats and riparian areas.

Both the Woodroffe Avenue and Southwest Transitway bridges will be built at the same time. A temporary detour will be built west of the future structures with a new signalized at-grade crossing of the VIA Rail line accommodating transitway buses, general traffic and the NCC multi-use pathway. Buses will operate in exclusive transit lanes through this crossing and transition into general traffic north of the crossing.

During construction, northbound and southbound bus queue-jumps will be built at the Slack Road intersection, and between Vaan Drive and the Nepean Sportsplex where they will tie into the existing dedicated bus-only lanes to the north to minimize transit delays.

It is anticipated that the existing 1,220 mm watermain will need to be protected during construction of overpasses and may require realignment. Overhead utility lines will need to be relocated to accommodate the Woodroffe Avenue overpass structure.

Details on the evaluation of the Woodroffe Avenue and Southwest Transitway overpasses are provided in Section 1-1, Table 1-4 of Document 2.

<u>Fallowfield Road Overpass</u>:

The Fallowfield Road overpass will cross over the VIA Rail and Barrhaven LRT tracks

approximately 40 metres north of the current crossing. This creates greater separation from the existing neighborhood, thereby reducing noise, vibration and air quality impacts and avoids building a costly temporary detour. It will have two traffic lanes in each direction and include a relocated existing multi-use pathway on the south side. The existing intersections providing access to Fallowfield Station and the adjacent shopping plazas on the south side will be reconfigured.

Figure 19 shows the multi-span bridge with lower approach embankments that reduce the project footprint and associated impact on NCC lands. The abandoned roadbed will be rehabilitated and provide space for landscaping, stormwater management and for potential community use. A new pathway connection linking to Fallowfield Station from the south will run under the overpass.

Figure 19: Fallowfield Road overpass (Looking northeast)

Details on the evaluation of the Fallowfield overpass are provided in Section 1-1, Table 1-5 of Document 2.

The local soils cannot support heavy embankment loads so each of the three overpasses will be long multi-span structures with lower approach embankments that allow space for recreational pathways and ecological connectivity underneath. The long multi-spans of the structures could also accommodate the planned additional track for VIA Rail corridor.

Train Storage and Servicing Facility (TSSF)

The TSSF site is at 1005 and 1045 Greenbank Road (a City-owned property) located at the north-east corner of Greenbank-Highbury Park intersection (site #5, Figure 20). This location would consolidate existing municipal infrastructure including an existing stormwater management facility. Vehicular access to the site will be from Highbury Park Drive, near Greenbank Road. Exterior lighting will be designed to prevent spill-over effects. The site will be protected by security fencing.

Inspections and servicing activities will be undertaken indoors, thereby reducing the impact of noise on the adjacent community. Nevertheless, it is recommended that a detailed stationary noise analysis be undertaken during detailed design to confirm mitigation needs. Measures could include equipment silencers, noise walls or berms around the perimeter of the property. Walls and/or landscaped berms could also be built as needed to reduce visual and noise impacts. The cost of these potential mitigation measures is included as contingency in the project estimate.

Figure 20: Greenbank TSSF site

Interim Transit Priority Measures:

The current bus-only lanes along Woodroffe Avenue between Baseline Station and the Nepean Sportsplex make transit service quick and reliable. The EA study also investigated additional relatively inexpensive transit priority measures for near term implementation to further improve transit service efficiency and reliability along Woodroffe Avenue. The new measures include: a new traffic signal at the intersection of Woodroffe Avenue and the Southwest Transitway entrance to Baseline Station (this would facilitate the north-bound left turn for buses heading to Baseline Station); and the relocation of a northbound near-side bus stop to far-side at the intersection of

Woodroffe Avenue and Norice Street.

Property Requirements:

The right-of-way required for the Barrhaven LRT has largely been protected through previously completed planning studies. However, the project still requires an additional 6.5 hectares of property from public and private landowners: 3.4 hectares of federal (NCC) land; 3 hectares from the private sector land; and, 0.1 hectare from Hydro One.

Private land required near the end of the LRT line to accommodate the alignment, station, and Park and Ride facility is currently vacant. As these lands are developed in future, City staff will work with the landowners to protect the land needed for the project.

Section 1 of the Barrhaven LRT has impact on three private rental properties, requiring the removal of 120 residential units out of a total of 205 units. These are rental properties and not social housing that the City manages. As there is a long lead time before the LRT project is in construction, residents of affected properties will have time to consider other appropriate housing options before the need to relocate. The City endeavours to continue informing residents of the advancement of the project, including updates on timelines so that residents can plan accordingly. The City will also work with its affordable housing partners and private sector developers to encourage them to offer similar housing options on adjacent lands or in nearby communities.

RURAL IMPLICATIONS

The project is within the City's urban area but does have positive impacts for rural residents. Rural residents can make use of the park and ride lots and access the LRT for connections to other parts of the City.

CONSULTATION

The study benefitted from the review and feedback of participants through the Agency Consultation Group (ACG), Business Consultation Group (BCG), and Public Consultation Group (PCG). Stakeholders include Indigenous groups, government agencies (Ministry of the Environment, Conservation, and Parks; Ministry of Heritage, Sport, Tourism and Culture Industries; Public Services and Procurement Canada; Environment and Climate Change Canada; Ministry of Natural Resources and Forestry), Ottawa Housing, NCC, VIA Rail, CN Rail, Rideau Valley Conservation Authority (RVCA), City's Accessibility Advisory Committee (AAC), Barrhaven Business Improvement Area (BIA), developers, landowners, business groups, School Boards, Community Associations and Special Interest Groups.

There were four meetings with the ACG, and three meetings each with the BCG and PCG. Consultation with the general public occurred primarily through two Open Houses, e-mails and additional meetings as required. A project website (www.ottawa.ca/barrhavenlrt) was established to share information on the study progress. At the first open house event 114 attendees signed in. The second open house was conducted online, with more than 5,000 page views of the project website, and 151 comment-questionaires were completed. Additional meetings were also arranged with representatives of property owners/developers to discuss specific project details and their development plans.

There is overall support for the project. Comments received on the recommended plan include: strong support for advancing the project and its early implementation; impact on rental housing units; potential noise and visual impacts of the elevated guideway; avoiding traffic impacts to Woodroffe Avenue during and post construction; providing a connection between the Nepean Sportsplex and the LRT Station; support for pedestrian and cycling facilities; making use of the space under the guideway; provide more parking; support for grade separations at the VIA rail crossings; limiting impacts on the NCC Greenbelt and green spaces; and impact on water quality.

Other comments received include: extending LRT south of Barrhaven Town Centre; enhancing bus connections and access to transit stations for the community on the east side of Woodroffe Avenue; property value; more pedestrian overpasses (at Meadowlands and Knoxdale stations); wider sidewalks; lighting of pathways leading to stations; pedestrian traffic and safety; and the need for denser developments along the LRT corridor.

Consultation was held with property owners whose lands are significantly affected, particularly the owners of the rental units. The feedback received include: project design; implementation timeline; property requirement; affect on renters; preference for tunnel option; and inquiring into the possibility of rezoning for higher density development. Meetings with other land owners and businesses along the corridor were also arranged. Comments received include: parking issues; internal pathways; property requirements; and rail grade separation of Woodroffe Avenue.

Comments (124 emails) were recieved from the Association of Community Organizations for Reform Now (ACORN) - an independent national organization of low- and moderate-income families. ACORN expressed concerns about the loss of private rental units, and the need for housing solutions.

The study area involved four wards: Barrhaven (3), College (8), Knoxdale Merivale (9)

and Gloucester South Nepean (22).

Notifications for the first open house were advertised twice and for the second open house three times in local newspapers (both English and French versions). Approximately 3,885 and 18,500 buckslips were mailed for the first and second open houses respectively. These notifications were also posted on the project website. A copy of each newspaper advertisement was provided to the offices of the Transportation Committee Chair and Ward Councillors for onward distribution to individuals on their mailing lists. Social Media platforms (Facebook and Twitter) were also used to distribute information about the open house events.

COMMENTS BY THE WARD COUNCILLOR(S)

Ward 3: This report is incredibly important and a key piece in moving forward with driving Ottawa's future LRT to fast growing Barrhaven building on our investment in LRT2 to Baseline. Safety upgrades at our VIA crossings as part of this investment cannot be measured. The plan will invest heavily in infrastructure at Fallowfield and Woodroffe.

Ward 8: No comment at this time.

Ward 9: I have been a supporter of LRT in Ottawa since I was first elected. It was a file I was very much engaged in while I Chaired the Transportation Committee. The train has certainly had its share of growing pains, but I believe we are getting back on track and that is why I am generally supportive of the stage 3 extension. Having said that I do have some concerns about this report.

I heard loud and clear from a number of residents that they are concerned about building up instead of tunneling or trenching. I took these questions very seriously and challenged staff in a number of meetings as to whether there was a different way to build the extension. I asked the engineers to check their data and analysis and to rigorously review their proposed approach. I wish to thank them for their additional review of the options.

Of bigger concern however is a matter that is not exactly engineeringly driven but significant, nonetheless. That is the fate of the homes along Woodroffe and more importantly the residents who live there. I have received many emails and telephone calls in this regard. I have met with Acorn and concerned tenants on this issue. Their concerns are real and valid. It is proposed in the report that in order for this project to proceed these homes need to come down. However, if this is the case, we equally need

to have a plan in place to address the impact of the homes coming down. I have met with staff on several occasions from a variety of departments including Transportation, Planning and OCH. There is definitely a will to address this situation and mitigate the impacts of any proposal that would remove homes. So now we have to find the way. There is encouraging language in this report so if passed we must immediately start work on finding ways to assist these residents and keep them whole. We need to roll up our sleeves and start finding and or creating options for these residents. We need to listen to them and collectively come up with a solution that does not take away a community from Ward 9 but rather enhances one.

I do not have a vote at committee on this matter. Therefore, I would ask my colleagues in making their decision to take into consideration the real life concerns of the current residents of the 120 units that could be torn down. If you are considering voting for the staff preferred proposal, please ask questions of staff as to why one of the other proposals that does not require the demolition of these properties is not being recommended. Please ask staff to confirm why the current recommendation is the best and only way to go. Finally, before voting please carefully weigh staff's answers against the very real concerns and questions of the residents.

If the staff proposal passes, I challenge staff and Council to work with me and my community to mitigate the impact of such a decision. As indicated earlier there are promising words in the report about supporting these residents and respectfully it is Council's responsibility to make sure they are followed through on.

Ward 22: I have no concerns with the report at this time. I think this is a positive step forward and will bring Barrhaven one step closer to having LRT as a transit option for its residents.

ADVISORY COMMITTEE(S) COMMENTS

Consultation with the City's Accessibility Advisory Committee (AAC) took place during the study and in the development of recommended plan. A member of the AAC participated in the Public Consultation Group meetings. This report was circulated to AAC for information.

LEGAL IMPLICATIONS

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

RISK MANAGEMENT IMPLICATIONS

The Barrhaven LRT currently does not have funding commitments for the next phase of implementation (such as design, property acquisition, procurement, and construction). This project is not included in the City's Affordable Network.

ASSET MANAGEMENT IMPLICATIONS

The recommendations documented in this report are consistent with the City's Comprehensive Asset Management (CAM) Program objectives. The implementation of the Comprehensive Asset Management program enables the City to effectively manage existing and new infrastructure to maximize benefits, reduce risk, and provide safe and reliable levels of service to community users. This is done in a socially, culturally, environmentally, and economically conscious manner.

FINANCIAL IMPLICATIONS

The cost to complete the Transit Project Assessment Process (TPAP) and to identify an alternate location to replace 1005-1045 Greenbank Road site will be funded from Capital project # 909067, 2018 Rapid Transit EA Studies. Funding for Stage 3 beyond the EA is not identified. The property acquisitions, for the non-City own sites, will be funded from future Stage 3 Light Rail Transit Barrhaven Extension capital budget requests for Council consideration and approval.

ACCESSIBILITY IMPACTS

The Recommended Plan for this project is developed to comply with the City's Accessibility Design Standards and other relevant guidelines.

The Barrhaven LRT will be designed to meet Ontario and City of Ottawa accessibility standards similar to Stage 1 and 2 LRT of the Confederation Line, and Trillium Line.

Consultation with the City's Accessibility Advisory Committee (AAC) took place during the study and in the development of recommended plan. A member of the AAC participated in the Public Consultation Group meetings and no comments were received on the recommended plan for the project. This report was circulated to AAC for information.

ENVIRONMENTAL IMPLICATIONS

An impact assessment of the Recommended Plan was completed for the project that identifies environmental implications and mitigation measures to be documented in the

study Environmental Project Report. These include:

Noise and Vibration

A noise and vibration assessment was completed to evaluate the potential impacts of the project on the surrounding noise sensitive land uses. Operational noise impacts due to the LRT project are not expected to be significant as noise levels along the alignment are dominated by area road traffic. At-source noise control measures in the form of a noise screen along elevated portions of the guideway is not warranted based on current guidelines. Should there be changes to the guidelines and best management practices in the future or changes in LRT design, it is recommended that noise control measures be reviewed at detailed design. The proposed Fallowfield Road re-alignment to the north will move the road away from nearby receptors, thus reducing road noise levels for residents on the southside. The activity and traffic patterns around existing bus stations and proposed LRT stations are expected to remain similar to the current stations, with the exception of Barrhaven Centre Station which will be reconstructed to include a new bus terminal and Park and Ride lot.

The proposed Train Storage and Servicing Facility is located 100 metres from the nearest sensitive receiver. Inspections and servicing activities will be undertaken indoors, thereby reducing the impact of noise on the adjacent community. Nevertheless, it is recommended that a detailed stationary noise analysis be undertaken during detailed design to confirm mitigation needs. Measures could include equipment silencers, noise walls or berms around the perimeter of the property. Walls and/or landscaped berms could also be built as needed to reduce visual and noise impacts.

Vibration impacts due to the project are not expected to be significant although, if required, appropriate mitigation such as ballast mats/track isolation and resilient track fasteners can be implemented. This can be confirmed during design.

The expected impacts from construction of the project will be limited to isolated and local surface construction generating an increase in occasional minor ground vibrations, emissions and dust, as well as intermittent noise. In all cases, air quality, noise and ground vibrations are not expected to be overly disruptive to commonly occurring regular activities and can be mitigated through standard best practices during construction.

Visual Impacts and Privacy

The project will change the existing views within the corridor and offer new views and

vistas across the NCC Greenbelt from the facility and rail grade-separations. The rail grade-separations have been designed to minimize embankment heights and use long open spans to allow for light penetration and views underneath the structures.

The elevated section from Baseline Station to the Nepean Sportsplex will become a new view from the surrounding land uses. Detailed landscape plans will be required throughout the corridor and will include preserving, to the extent possible, existing vegetation and provide new opportunities to mitigate views of the elevated facility to the surrounding community. Where the project includes elevated sections, the space under the guideway can be programmed for community benefiting uses including parks and recreational pathways.

The elevated facility is located 40 metres to 60 metres from existing residences along Beechcliffe Street. Where residential lands are required to implement the LRT, the remnant lands could be redeveloped to include more transit-oriented land uses and oriented to minimize impacts to privacy.

Natural Environment

The LRT alignment, while largely within an urban context, does cross the NCC Greenbelt between West Hunt Club Road and Fallowfield Road.

The project includes three existing water crossings: one at the north end of the Greenbelt that provides drainage from the agricultural fields to storm systems under and along Woodroffe Avenue and West Hunt Club Road; and two crossings of Black Rapids Creek closer to Fallowfield Station. Impacts to fisheries and aquatic habitat, as well as water quality, can be avoided using standard design and construction practices such as adhering to in-water timing restrictions and by implementing erosion and sediment control measures.

The project will require the removal of some vegetation along the edge of the Tallwood Woods, an urban woodlot. A detailed tree conservation report and landscape plan will be required prior to project implementation to minimize the impact to trees and identify areas where new trees could be provided.

There is potential for the project to interact with urban and rural species, as well as Species at Risk. The need for more targeted species/inventories will be documented in the EA report (Environmental Project Report), and with the application of mitigation measures, potential impacts can be reduced or eliminated following all federal and provincial permitting requirements. In addition, the project will need to adhere to the City

of Ottawa Protocol for Wildlife Protection during construction. Stations will be designed following the City of Ottawa's draft guidelines for bird-safe design.

Climate Change

Electric LRT will have a positive effect on climate change when compared to the effects of the current and future diesel bus service that operates in the corridor today. The reliability and convenience of LRT will also encourage residents to switch from single-occupancy vehicle trips to transit. In addition to electric propulsion, which reduces greenhouse gases, particularly sulphur and nitrogen oxides and other contaminants, LRT also reduces the number of vehicles required to carry large volumes of passengers. The rail grade separations will also eliminate vehicle idling and congestion associated with the existing at-grade crossings while waiting for trains to pass, thus contributing to a cleaner local environment in the community.

There are also activities that can be done during construction to minimize the project's negative impacts on the environment such as: waste reduction/re-use/diversion measures; sourcing local materials where possible; minimizing tree removals; and other best management practices to reduce temporary noise and air quality impacts. The LRT design will include measures to increase its resiliency to the effects of climate change, which can include: stormwater management strategies that consider extreme weather events; landscaping plans that include additional shelter and rest elements to shield facility users from extreme heat; and developing maintenance plans throughout the lifecycle of the facility, including snow and ice management strategies.

TERM OF COUNCIL PRIORITIES

The recommendation contained herein aims to support the following priority and outcomes of the City of Ottawa Strategic Plan 2019-2022:

Priority: Integrated Transportation

Outcomes:

- An integrated transportation network that incorporates all modes of getting around;
- Residents have easy access to their preferred transportation choice; and,
- Transportation infrastructure investment is sustainable and meets long-term needs.

SUPPORTING DOCUMENTATION

Document 1 - Recommended Plan (Baseline Station to Barrhaven Town Centre)

Document 2 - Evaluation Criteria and Results

DISPOSITION

Following Transportation Committee and Council approval of the report, Transportation Services Department will:

- Complete the Transit Project Assessment Process (TPAP) in accordance with the Ontario Regulation 231/08 of the Ontario Environmental Assessment Act, finalize the Environmental Project Report and make it available for the 30-day public review period;
- Build into a future budget and work program the implementation of the interim transit priority measures on Woodroffe as described in this report; and,
- Collaborate with other departments to remove 1005- 1045 Greenbank from further consideration for affordable housing and investigate alternative short-term sites along the planned Stage 3 LRT corridors for a replacement site. Staff will report back on the proposed replacement site once identified.