

## 2 Project Need and Opportunities

This section outlines the need and opportunities for the EA Study, which is based on the City's planning policies and studies, current and future transit demand, transit network requirements and land use objectives. As the Barrhaven LRT extension is the last section of the Confederation Line without an EA approval status, there is a need to complete this Study in order to enable decision-making on future transportation investment and choices. Further, there is also a need derived from the Transportation Safety Board (TSB) Recommendation R15-05, which is that regarding rail grade-separations provided by the TSB of Canada in its Railway Investigation Report R13T0192 on the September 2013 VIA Rail and OC Transpo crossing collision in Barrhaven. The EA requirement of the TSB recommendation that "the City of Ottawa reconsider the need for grade separations at the Woodroffe Avenue, [Southwest] Transitway, and Fallowfield Road level crossings" will be addressed through this study's findings.

### 2.1 Need for the Project

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#### 2.1.1 MEETING PLANNING POLICY

##### 2.1.1.1 Official Plan

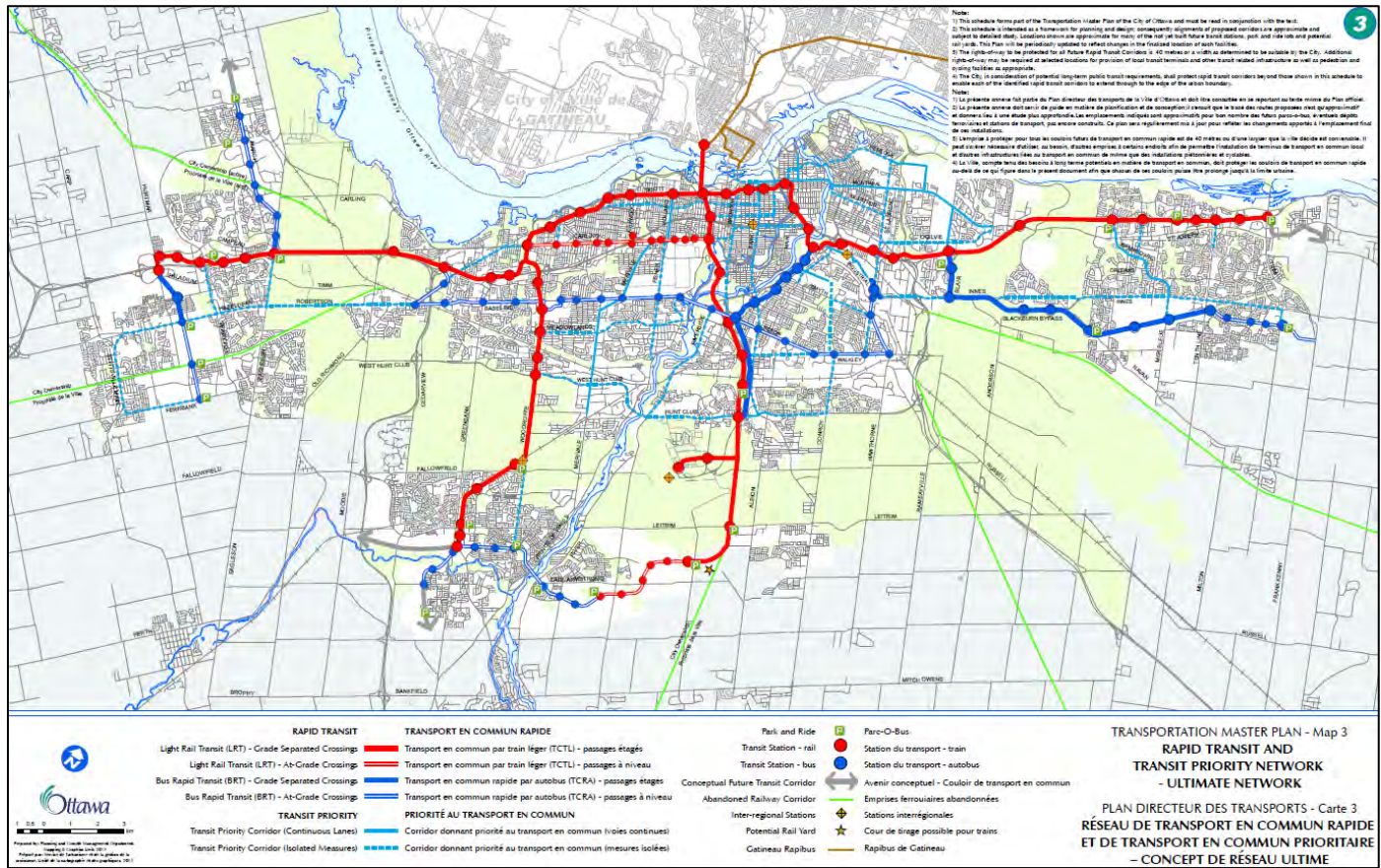
The City of Ottawa Official Plan, 2013 (OP) provides a vision of future growth for the City and sets the policy framework to guide its physical development over the planning horizon to the year 2031. The plan is updated every five years to meet statutory requirements, the last review having been completed in 2013. This EA study aims to address the OP's Strategic Directions, as follows:

- The Barrhaven LRT and Rail Grade-Separations project will support sustainable growth in the Barrhaven community which is located within the City's urban boundary. It will foster mixed-use growth around transportation nodes, which can provide affordable housing, community services, employment and leisure opportunities to the Barrhaven community (OP Section 2 – Strategic Directions, 2.1 Patterns of Growth, Managing Growth).
- It will connect Barrhaven Town Centre with the City's LRT network and will also supply increased and safer transportation network capacity necessary to support increased development densities (OP Section 2 – Strategic Directions, 2.1 Patterns of Growth, Building Liveable Communities).
- The Barrhaven LRT will connect to the walking and cycling networks, fostering an active and multi-modal transportation network. Implementation of this and other rapid transit projects in the Barrhaven community will encourage automobile users to switch to transit, necessary to achieve the significant transit ridership increases contemplated in the OP (OP Section 2 – Strategic Directions, 2.1 Patterns of Growth, Providing Infrastructure).
- The project will contribute to improved local air quality by providing an alternative to automobile use, by removing cars idling at intersections and by replacing the diesel Bus Rapid Transit (BRT) vehicles with electric LRT. The project supports a compact urban form, which will contribute to reduced energy use, carbon and pollution emissions (OP Section 2 – Strategic Directions, 2.1 Patterns of Growth, Maintaining Environmental Integrity).
- As the project will generally follow the existing transitway corridor, it will require minimal alteration to existing green spaces and environmental areas (OP Section 2 – Strategic Directions, 2.1 Patterns of Growth, Providing Infrastructure).

##### 2.1.1.2 Transportation Master Plan

The City's Transportation Master Plan, 2013 (TMP) identifies extension of the Confederation Line LRT to Barrhaven Town Centre as part of the Ultimate Rapid Transit and Transit Priority (RTTP) Network as shown in **Figure 2-1**, with an implementation timeline currently envisaged beyond the TMP's 2031 planning horizon. As part of the RTTP 2031 Network Concept, the TMP identifies completion of the Southwest Transitway as an exclusive Bus Rapid Transit (BRT) facility prior to extension and conversion to LRT technology south of Baseline Station. This staging will be re-evaluated as part of the evaluation of alternative solutions (**Section 4**) for this study and any updates brought forward for consideration as part of the next TMP update.

Figure 2-1 TMP Ultimate Rapid Transit Network



The Barrhaven LRT (Baseline Station to Barrhaven Town Centre) extension is the last remaining segment of the Confederation Line for which EA approval is not yet in place. Therefore, there is a need to complete this EA Study so that planning and decision-making for the City's LRT network can be advanced. This EA Study will help inform the next TMP update, which will consider prioritization of future rapid transit investments as part of the City's Affordable RTTP Network.

## 2.2 Rapid Transit Network Overview

The City's current TMP, updated in 2013, identifies the following RTTP network serving the Barrhaven LRT and Rail Grade-Separation EA Study Area:

1. A grade-separated rapid transit corridor running in the existing Southwest Transitway corridor from Baseline Station to Barrhaven Centre Station, with BRT technology implemented as part of the 2031 network concept and conversion to LRT implemented as part of the ultimate network concept.
2. An at-grade BRT corridor is identified for Chapman Mills Drive/Strandherd Drive between Greenbank Road and the future Limebank O-Train Line 2 Station. This facility currently exists between Longfields Drive and Nepean Woods Park and Ride. Future extension of the Chapman Mills BRT corridor to west of Cedarview Road is proposed (Chapman Mills Extension and Bus Rapid Transit EA Study, 2016).
3. An at-grade BRT corridor is identified (future Southwest Transitway Extension) in the re-aligned Greenbank Road corridor running from Chapman Mills Drive to Cambrian Road, with a future extension to Barnsdale Road and a Park and Ride facility in the vicinity of Kilbirnie Drive.
4. Transit priority corridors (isolated measures) are identified for:
  - a. Meadowlands between the Southwest Transitway and Heron Road;
  - b. West Hunt Club Road between Woodroffe Avenue and Riverside Drive; and
  - c. Woodroffe Avenue between Fallowfield Station and Nepean Woods Park and Ride.

## 2.2.1 PREVIOUS PLANNING STUDIES

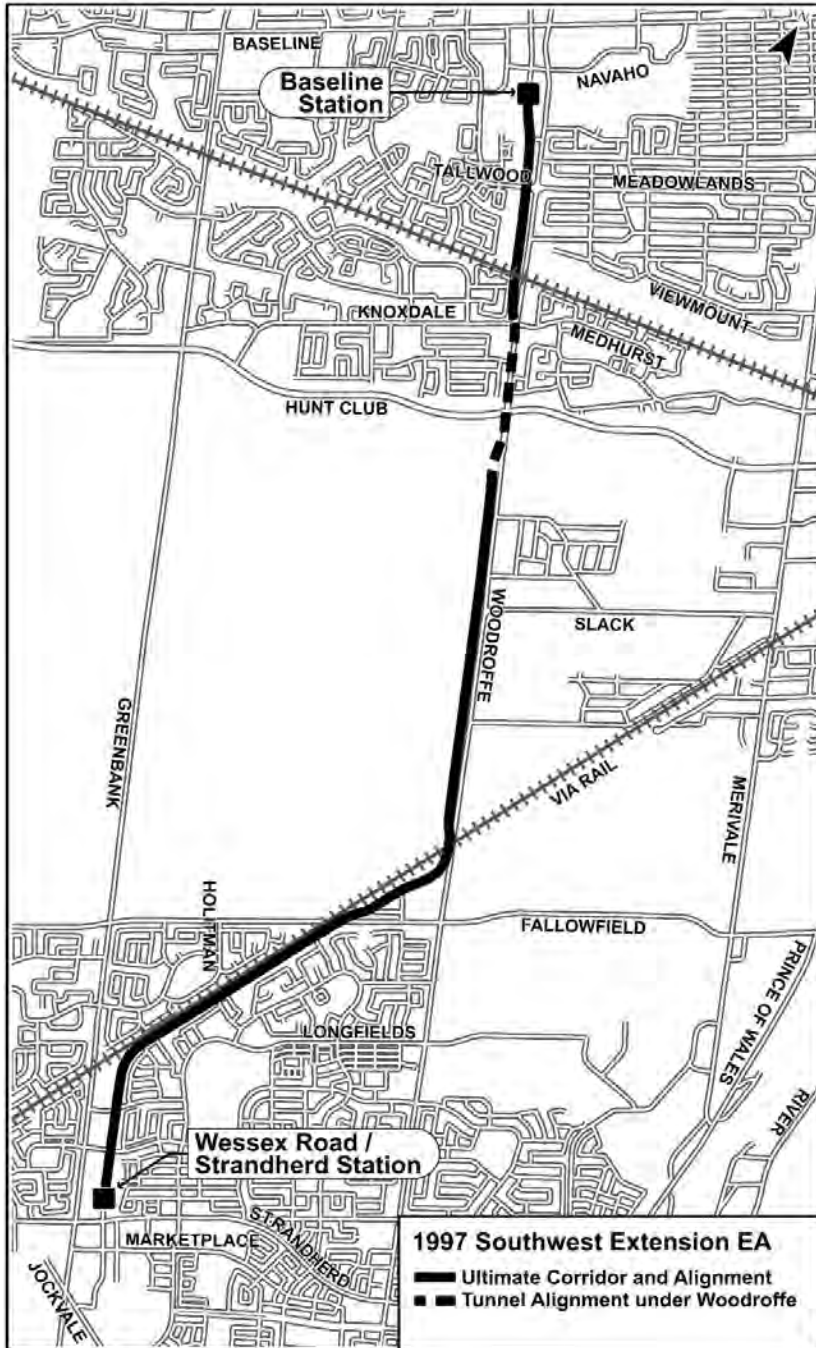
### 2.2.1.1 Southwest Transitway Extension Environmental Assessment (1997)

To enable construction of the existing Southwest Transitway corridor, the Southwest Transitway Extension EA was completed in 1997 (hereafter, “the 1997 Southwest Transitway EA”). The goal of the EA was to identify a fully segregated BRT facility to extend transit service from Baseline Station to the growing southern urban community of Barrhaven.

Among the alternatives considered, the EA assessed bus versus heavy-rail technology, widened roadways featuring bus-only lanes and traffic demand measures. It concluded that all non-transitway alternatives would not provide a robust solution to address future transit capacity and need for the south urban community and that the Woodroffe Avenue corridor offered the best potential for development of a transit facility to improve transit services. A phased approach was identified, which included initial widening of Woodroffe Avenue to accommodate dedicated bus-only lanes as a first stage of project implementation.

The EA identified that the ultimate Southwest Transitway corridor would be grade-separated, in an open-cut, urban style section west of Woodroffe Avenue between Baseline Station and Knoxdale Road. It would be tunneled under Woodroffe Avenue between Knoxdale and Hunt Club roads. Through the Greenbelt, the transitway would be placed west of Woodroffe Avenue at-grade, crossing under the VIA Rail line (then CN Rail line) to the new Park and Ride facility at Fallowfield Station. The transitway would then continue at-grade and parallel to the rail line to Wessex Road where it would terminate at-grade. Full grade-separation was proposed at all transitway crossings, including roads, railways, and walkways. This alignment is illustrated on **Figure 2-2**.

Figure 2-2 The 1997 Southwest Transitway EA alignment



The EA also noted that construction of the transitway facility could be staged over a number of years as funding demand and increased revenues permitted. The EA recommended construction of interim measures, such as bus only lanes from Norice Drive to Hunt Club along Woodroffe Avenue and widening of Woodroffe Avenue as a four-lane divided roadway through the Greenbelt. Since approval of the 1997 Southwest Transitway EA, bus only lanes have been implemented between Baseline Station and the Nepean Sportsplex and widening of Woodroffe Avenue through the Greenbelt has taken place. The new Fallowfield Station and Park and Ride have also been constructed. Widening of Fallowfield Road (west and east of Woodroffe Avenue at the Park and Ride site) and widening of Woodroffe Avenue (south of Fallowfield Road) were also completed.

Both the Southwest Transitway's ultimate alignment as well as Bus Only Lane alternatives would provide grade-separations at all rail crossings, roadways, walkways, and trails. As per **Figure 2-3**, the VIA Rail line (then CN Rail line) would be at-grade

with underpasses for both Woodroffe Avenue and transitway, and as per **Figure 2-4** the transitway would run parallel to the rail, with Fallowfield Road as an underpass. Therefore, grade-separations between the transitway/Woodroffe Avenue and rail line as well as Fallowfield Road and the rail line were an intrinsic part of the 1997 Southwest Transitway EA study.

Figure 2-3 1997 Southwest Transitway EA, exhibit 6-22, grade-separations of CN Rail, Woodroffe Ave and proposed Transitway

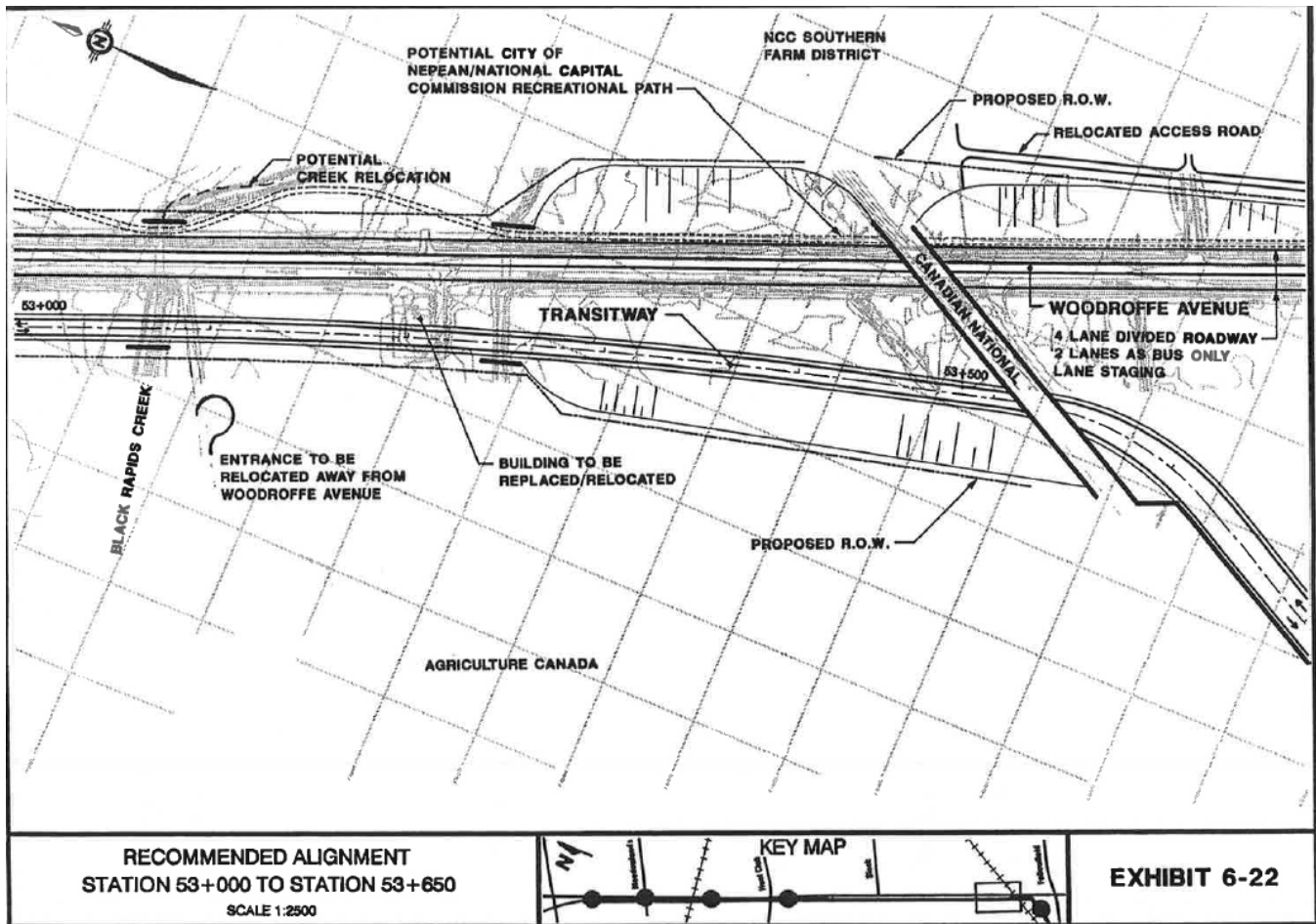
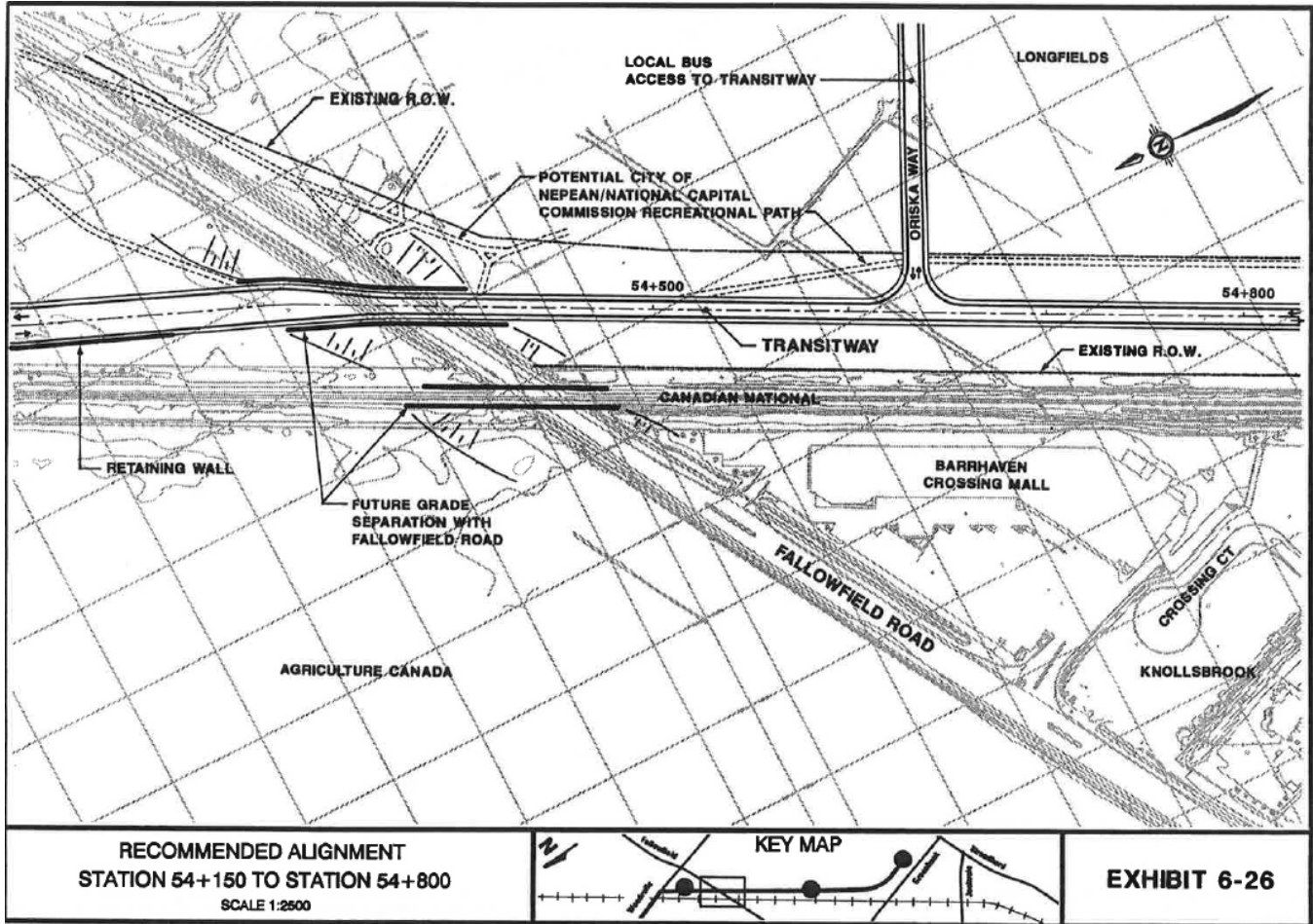


Figure 2-4 Southwest Transitway EA, exhibit 6-22, grade-separations of CN Rail, proposed Transitway and Fallowfield Road



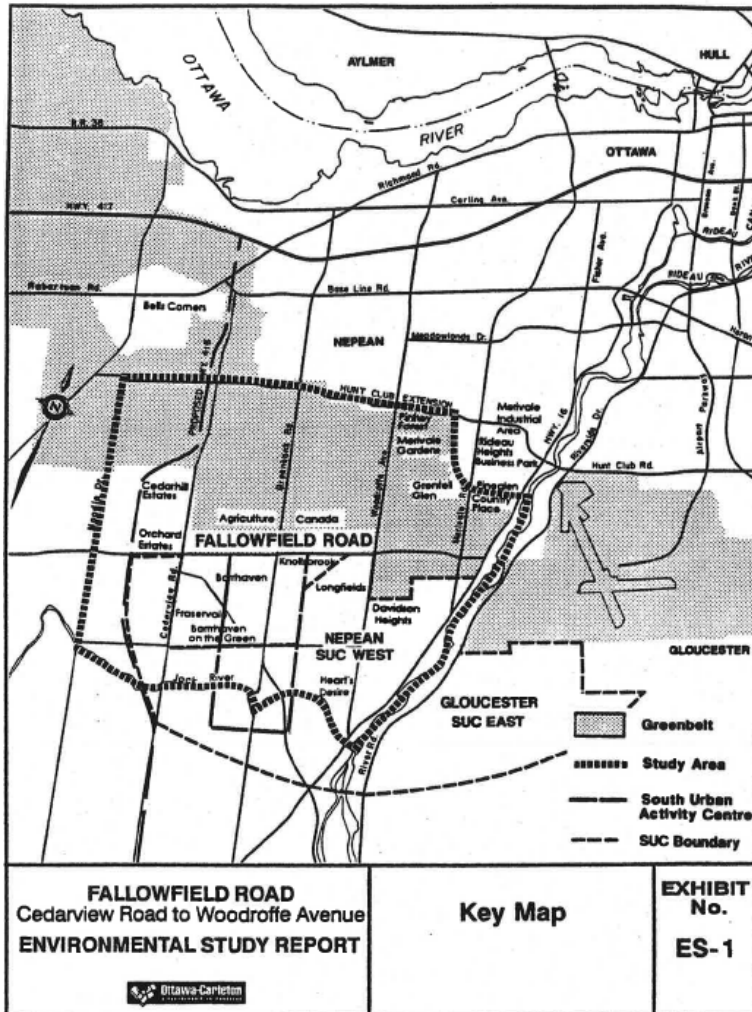
The 1997 Southwest Transitway EA study also had as a key requirement to “be a facility which can be flexible enough that a range of future demand levels and technologies can be accommodated” (Section 2.4). The geometric design and structural elements of the Southwest Transitway were planned so that the possibility of eventually operating a rail technology on it would not be precluded.

As of 2018, the ultimate transitway corridor and alignment as approved via the 1997 Southwest Transitway EA has not yet been fully implemented, with the fully exclusive BRT facility only existing south of Hunt Club Road. North of Hunt Club Road to Baseline Station, buses operate in dedicated curb lanes along Woodroffe Avenue.

### 2.2.1.2 Fallowfield Road Environmental Assessment (1997)

An EA was completed in 1997 for the widening of Fallowfield Road, from Cedarview Road to Woodroffe Avenue, from a two-lane rural undivided roadway to a four-lane divided urban arterial road to address future peak-hour traffic volumes. The EA’s Study Area map is shown in Figure 2-5.

Figure 2-5 1997 Fallowfield Road (Cedarview Road to Woodroffe Avenue) EA, Study Area



As part of this EA, the proposed planning and design criteria for reconstruction of Fallowfield Road included: providing a four-lane divided roadway geometry, including commuter bicycle lanes, greening strips, and noise attenuation measures. During consultation with the Public Advisory Committee, it was agreed that an underpass solution for Fallowfield Road was preferred to grade-separate the then proposed Southwest Transitway and the then CN Rail line (now VIA). Underpass was proposed as the visual effects caused by an overpass (Fallowfield Road over Southwest Transitway and the CN Rail line) were deemed significantly adverse and the limited geotechnical investigations then considered an underpass a feasible option.

Approval for the need and construction of the rail grade-separation of Fallowfield Road, the Southwest Transitway and CN Rail was established and granted via approval of this EA as a Schedule C project under the Ontario’s Class EA for Municipal Road Projects.

Subsequent to approval of the 1997 Southwest Transitway EA and Fallowfield Road EA studies, the City undertook preliminary engineering in support of constructing the rail grade-separations at the Woodroffe, Southwest Transitway and Fallowfield crossings. Additional geotechnical assessments done as part of this work identified significant cost and risk implications with the proposed underpasses, with a recommendation that the open-cut option should not be pursued and that it was necessary to consider other alternatives.

**2.2.1.3 Southwest Transitway Extension and Woodroffe Widening Federal Environmental Assessment (2004)**

A federal EA was completed in 2004 under the Canadian Environmental Assessment Act (CEAA). The CEAA was triggered due to funding provided by the Federal Government (under the Millennium Fund program) and due to the need for land acquisition

from the NCC. The 2004 EA assessed construction of a two-lane Transitway placed adjacent and to the west of Woodroffe Avenue from the Nepean Sportsplex to the Fallowfield Park and Ride site, as well as reconstruction of Woodroffe Avenue as a four-lane arterial roadway from its then existing four-lane section north of Slack Road to Fallowfield Road.

### 2.2.1.4 Southwest Transitway Extension EA Study (2006)

On 7 April 2004, the City’s Transportation Committee approved the Statement of Work setting out the methodology, public consultation, and deliverables for the EA study for the proposed Southwest Transitway Extension Project and the Greenbank Road Widening Project (Malvern to Cambrian). Both facilities were evaluated together under one analysis but followed separate EA processes due to the physical proximity to each other and similar study areas. The Southwest Transitway Extension study was carried out as an Individual Environmental Assessment, with a separate Terms of Reference developed and approved by the Minister of the Environment. The Greenbank Road study followed the Municipal Class EA process. The recommended alignment of each new facility resulting from EA is presented on **Figure 2-6**.

The Southwest Transitway Extension EA study from Strandherd Drive to Cambrian Road was completed in 2006. It represents a continuation of the transitway established from the 1997 Southwest Transitway EA which terminated at Strandherd Drive. It is 3.2 km of exclusive and shared Right-of-Way, extending from Strandherd Drive southerly, through the South Nepean Town Centre, across the Jock River to Cambrian Road reaching the planned Barrhaven South community. It consists of exclusive transit lanes throughout its length, five stations (including provision for an integrated BRT/LRT station in the heart of the South Nepean Town Centre). Trip projections (2021) estimated that up to 4,075 riders per hour could be served by the project (representing a 25% modal split as proposed by the Barrhaven South Community Design Plan).

Figure 2-6 Recommended Alignments for the Southwest Transitway Extension and the Greenbank Road Widening Studies



### 2.2.1.5 Confederation Line West LRT Extension (2016)

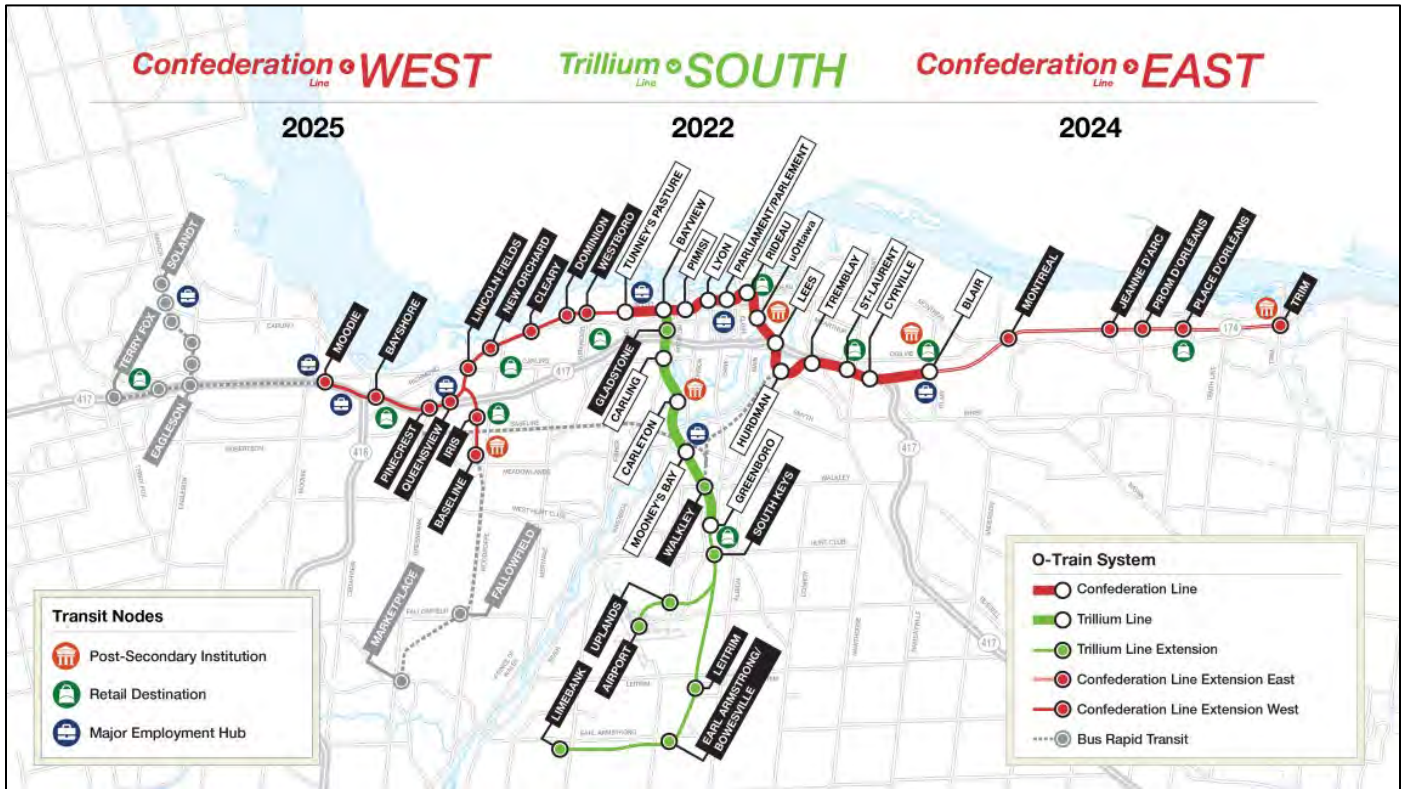
A planning and EA study was completed in June 2016 for the Confederation Line West LRT Extension to extend light rail service further west from Tunney’s Pasture Station to Baseline and Bayshore stations as part of the City’s proposed Stage 2 LRT network.

The study also gained approval for a new Light Maintenance and Storage Facility, to be located at the western portion of the vacant lands immediately north of the CN tracks (CN Beachburg Subdivision) between Woodroffe Avenue and Merivale Road. Subsequent to completion of the study, this Light Maintenance and Storage Facility was superseded by a facility proposed to the west of Moodie Drive, which was identified as part of the Stage 2 LRT project, which also includes a further extension of



the West LRT from Bayshore Station to Moodie Station (Figure 2-7). The anticipated opening of the Confederation Line West LRT extension is 2025.

Figure 2-7 Confederation Line West LRT Extension Alignment



### 2.2.1.6 Barrhaven and Merivale Road Rail-Grade Separation Study (2017)

The Barrhaven and Merivale Road Rail-Grade Separation Study (BMRRGSS), completed in June 2017, addressed five potential rail-grade separations along the VIA Rail line (Smiths Falls Subdivision) between Merivale Road in the east and Jockvale Road in the west. The study was undertaken in response to TSB Recommendation R15-05 from the Transportation Safety Board of Canada in its Railway Investigation Report R13T0192 on the VIA Rail/OC Transpo train and bus collision that occurred on 18 September 2013 at the VIA Rail line/Southwest Transitway level crossing. The TSB Recommendation R15-05 states: “The City of Ottawa reconsider the need for grade separations at the Woodroffe Avenue, [Southwest] Transitway, and Fallowfield Road level crossings”.

As per the Railway Investigation Report, “the safety of a crossing is dependent on a roadway vehicle driver making appropriate decisions based on the information displayed and responding appropriately to any additional warnings. Consequently, the only way to ensure that similar accidents do not occur at such high-traffic locations is to physically separate the roadway from the railway through grade separation (Section 4.2.4).”

The BMRRGSS assessed opportunities for rail grade-separation and made recommendations based on an assessment of the “Grade Crossing Regulations” prepared by Transport Canada which provide guidance as to when grade-separation should be considered. Common practice for determining grade-separation requirements in Canada is to use a Crossing Exposure Index (CEI) calculation, also known as cross-product value, and a review of risks at the crossing. Historically a cross-product value of 200,000 has been accepted as the benchmark used by Transport Canada in determining when grade-separation should be considered. The cross-product is determined by multiplying the Average Annual Daily Traffic (AADT) by the average daily number of trains at the at-grade crossing.

Table 2-1 provides a summary of the cross-product values for Woodroffe Avenue, Southwest Transitway and Fallowfield Road with the preferred grade-separation solution.

Table 2-1 Crossing Exposure Index analysis and recommended solution

VIA Rail (Smiths Falls Subdivision line) crossing	Mile	Traffic Volume *AADT			Train Volume			Crossing Exposure Index / Cross-Product Value	Preferred Grade-Separation Solution
		2016	2021	2031	HFR	2016	2021		
		2016	2021	2031	2016	2021	2031		
		2016	2021	2031	2016	2021	2031		
Woodroffe Ave	3.28	30,619			26			796,094 1,115,598 2,019,241	Overpass Road over rail
		33,806			33				
		41,209			49				
Southwest Transitway	3.30	1,136 x 32			26			945,152 1,466,784 3,255,168	Overpass Road over rail
		1,389 x 32			33				
		2,076 x 32			49				
Fallowfield Road	3.88	29,468			19			559,892 683,235 1,467,420	Overpass Road over rail
		32,535			21				
		39,660			37				

The BMRRGSS recommended that the grade-separations be phased over time. Prioritization could be based on the greatest exposure of vehicle/train conflict which would result in an implementation order, from first to last, of: Woodroffe Avenue and the Southwest Transitway, Fallowfield Road, Merivale Road and Jockvale Road.

As the alignment identified for the Barrhaven LRT project will follow the existing Southwest Transitway corridor, which crosses the VIA Rail line at-grade immediately adjacent to the existing Woodroffe Avenue crossing of the VIA Rail line, and also will need to be grade-separated at Fallowfield Road, it is prudent to consider an integrated planning and EA approach to both LRT extension and rail grade-separation facilities.

### 2.2.2 ADDRESSING TRANSPORTATION ISSUES

Currently, transit service within the Study Area consists of a mixture of local, connection routes and transitway services. Local routes generally circulate within the community and connect with transitway Stations. Connexion routes are peak only direct services between various neighborhoods and downtown Ottawa. Transitway routes serve as the backbone of the rapid transit network, connecting Barrhaven with downtown Ottawa and other important destinations across the City.

With implementation of the Stage 1 and Stage 2 LRT projects, the existing BRT corridor will be converted to LRT technology as far as Tunney's Pasture (2019) and Baseline Station (2023). While implementation of LRT should address some of the existing short-term capacity and reliability issues currently affecting transit service to the Barrhaven community (by eliminating reliability issues due to on-street operation through the downtown core and permitting reallocation of existing resources to provide capacity improvements), conversion of the existing BRT corridor north/east of Baseline Station will introduce a transfer requirement for trips originating in Barrhaven and travelling beyond the LRT terminus point. While transfers are a component of many transit trips, particularly those not beginning and ending along a rapid transit line, and can be managed through careful design and service planning, the introduction of a transfer and resulting increase in travel time can impact ridership, particularly where the transfer represents a break in a journey to continue in the same direction and at the same or similar level of service quality (i.e. BRT to LRT). However, overall, the conversion of existing BRT corridors to LRT technology will improve the overall customer experience, particularly as Ottawa's LRT network is extended to serve more destinations.

With respect to the Woodroffe Avenue, Southwest Transitway and Fallowfield Road/rail level crossings, existing issues are based on safety and traffic operations impacts associated with conflicts between trains, transit, and vehicular traffic. Given the limited road network serving north-south travel into and out of Barrhaven, disruptions at these crossings can result in significant congestion and delay on the road and transit network.

## 2.3 LRT Maintenance and Storage Facility

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Expansion of the City's LRT network will require additional Light Rail Vehicles (LRVs) to operate services and support ridership growth. As part of the Stage 1 (Tunney's Pasture – Blair) Confederation Line LRT project, the City has constructed a Maintenance and Storage Facility (MSF) at Belfast Road, with an additional Light Maintenance and Storage Facility (LMSF) identified and under construction as part of the Stage 2 Confederation Line East and West LRT Extensions project, located west of Moodie Drive.

As part of this study a review of future fleet requirements was undertaken to confirm the number of additional LRVs needed to operate the Barrhaven LRT extension as well as to reflect overall fleet growth to the year 2048 based on current planned LRT projects and anticipated ridership growth. The conclusion of this review was that the Belfast and Moodie sites will have sufficient capacity to accommodate heavy maintenance and storage of the LRV fleet in the long-term. However, given the distance from either the Moodie or Belfast facility to Barrhaven Town Centre and the need for trains travelling to/from the Moodie facility to make a reverse move at Lincoln Fields Station it was determined that a storage and servicing facility capable of accommodating 16 LRVs (8 trains) be provided as part of the Barrhaven LRT extension. This will permit off-peak and overnight storage as well as servicing of trains (e.g. cleaning, inspection and minor "running repairs"), improving the efficiency of LRT operations by reducing non-revenue train movements and increasing the overnight time window available to undertake inspection and maintenance of LRT infrastructure.

Alternative locations for the Train Storage and Servicing Facility (TSSF) and their evaluation are discussed in the evaluation of alternative designs section of this report (**Section 6.2.4**).

## 2.4 Opportunities

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### 2.4.1 MEETING FUTURE RIDERSHIP TARGETS

The City's OP encourages areas around major transit stations to develop as compact, walkable, mixed-use developments with densities that support transit use. The areas to be served by the Barrhaven LRT are anticipated to grow substantially over the planning horizon. The City's population is forecasted to grow 23% from 2011 to 2031 with 79% of that growth predicted to occur in urban areas outside the Greenbelt. The number of jobs is projected to grow about 24% from 2011 to 2031, with 72% occurring in the inner area and suburbs. This points to a need to move an increased number of people efficiently, reliably, and safely from outer areas into the central area, and vice-versa. As such, the number of transit trips taken into the inner area and suburbs is expected to rise substantially. The areas targeted for Transit Oriented Development (TOD) and intensification at mixed-use centres located at CentrepoinTE and Barrhaven Town Centre within the Study Area will see an increased demand for people wanting to live, play and work both in their neighborhood and downtown. Higher rapid transit technology such as LRT supports these forecasted trends by fueling growth and redevelopment.

Coinciding with this growth are the aggressive modal splits the City aims to achieve by 2031. By 2031, the City of Ottawa aims to have nearly 26% of all morning-peak period travel occur via public transit. This is an aggressive target considering that over the same period, the total number of trips taken is projected to grow by 32%. To support achievement of these splits, the Barrhaven LRT will provide a more efficient and reliable level of transit service, as well as an improved user experience than the current BRT service. With substantial planned improvements to transit service downtown and limited planned increases to road capacity, the modal share of transit within the travel market will increase. High rates of transit ridership to, from and within the inner area and suburbs are expected to continue.

Future transportation demand for both road and transit networks is modelled using the City's Regional Transportation (TRANS) model, which uses future population/employment projections, broken down by traffic zone, and assigns trips to various modes and on to the future transportation network. The model is calibrated based on existing travel data (origin-destination, traffic volumes) and provides a good approximation of likely future travel demand at both the screenline and corridor level.

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.

The Barrhaven LRT will provide for a connection with the existing VIA Rail Fallowfield Station. The LRT project and potential VIA Rail High Frequency Rail project offer increased access for intercity rail travel to/from the south and west areas of the City of Ottawa as well as the potential opportunity for an integrated multi-modal station at Fallowfield.

Construction of the LRT project will also offer opportunities to advance additional transit priority measures along the corridor to increase local transit integration with rapid transit services, improving transit rider experience and encouraging additional transit ridership by prioritizing transit services.

### **2.4.2 ENVIRONMENTAL GAINS**

Electric LRT can have net positive environmental impacts when compared against comparable levels of diesel BRT service required to move a similar number of people. 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 the large volumes of passengers predicted. Modern LRT vehicles are also typically quieter than the buses they replace and provide a high-quality service for riders while reducing impacts on the areas around BRT facilities. The rail grade-separations will also provide an opportunity to eliminate vehicle idling and congestion while waiting for trains to pass, thus contributing to a cleaner local environment in Barrhaven.

Replacement of existing BRT services in the Southwest Transitway corridor will remove approximately 200,000 annual revenue bus trips, resulting in lower diesel fuel consumption and greenhouse gas emissions. Conversion of the existing bus-only roadway between Nepean Sportsplex and Barrhaven Centre will reduce the amount of road salt needed during winter operations, resulting in improved water run-off quality from transit infrastructure in the corridor.

As part of the LRT project, additional pedestrian and cycling connectivity elements will be identified and constructed to encourage station access by those modes. These facilities will also add to the overall pedestrian and cycling network in the City, providing greater opportunities for residents to use walking or cycling modes for local trips, reducing automobile dependence and associated environmental impacts.

### **2.4.3 SAFETY**

Implementation of the rail grade-separations at the Woodroffe, Southwest Transitway and Fallowfield crossings of the VIA Rail line represent a significant opportunity to improve safety, accessibility and connectivity in this area of the City. As per the 1997 Southwest Transitway EA as well as 1997 Fallowfield Road EA, rail grade-separation has been one of the fundamental design criteria for construction of the transitway as well as major roads. Extension of LRT to Barrhaven will require grade-separation at the existing Southwest Transitway and Fallowfield Road crossings of the VIA Rail line based on operating requirements for LRT. These grade-separations will eliminate risk of collision between trains and roadway users at the Woodroffe and Fallowfield crossings and between trains and transit at the Southwest Transitway crossing. As mentioned in **Section 2.2.1.6**, Woodroffe, Fallowfield and the Southwest Transitway crossings with the railway are all currently above the 200,000 cross-product value thresholds and by 2031 will be well beyond the threshold.

### **2.4.4 ENHANCED TRANSIT EXPERIENCE**

The current BRT system within the Study Area includes a mixture of exclusive roadway (transitway) and dedicated (curb) bus lanes between Baseline Station and Barrhaven Town Centre. A completely segregated LRT system extending into Barrhaven Town Centre will enhance the experience for all transit passengers by increasing accessibility to LRT, reducing bus-rail

transfers for many users, and providing high quality connecting facilities that promote walking and cycling access to stations in the Barrhaven community.

Modern LRT vehicles will provide a higher quality trip through increased rider comfort, frequent and predictable travel times and efficient connections with bus feeder routes at stations. New stations provide the opportunity for enhanced amenities and services to passengers including information about next train arrival and journey times as well as increased capacity and weather protection for passenger transfers. Station facilities will be sized to meet expected need, preventing over-crowding and improving the customer experience.

A new Park and Ride facility at Barrhaven Centre Station will provide improved transit access for residents beyond the LRT terminus. This Park and Ride facility is envisaged as a temporary facility to accommodate existing demand and support transit ridership, with ultimate co-location of parking facilities within a proposed “Civic Complex” to be located adjacent to Barrhaven Centre station.

Stations along the line, particularly within the Barrhaven Town Centre provide significant opportunities for economic uplift through new transit-oriented development which will enable residents to access housing, retail, institutional and employment opportunities by transit.

The insertion of the LRT infrastructure within the Woodroffe Avenue corridor and conversion of the existing Southwest Transitway offer opportunities to refresh existing landscape/streetscaping and provide for new amenities including public art, pathways and benches, parks and public gathering spaces.

#### **2.4.5 HEALTH BENEFITS**

The OP lays out strategic directions to meet the challenge of growth in ways that support healthy and liveable communities and healthy environments. This includes a focus on making services accessible by transit, encouraging walking and cycling, and will contribute to the needs of an aging population by increasing accessibility to health services and community facilities.

Healthy, liveable communities are at the core of the OP and are addressed in part through the strategic direction of providing infrastructure (OP Section 2.3), with a focus on complete streets, active transportation, and transit (City of Ottawa 2013, as amended). Healthy communities are further defined by Ottawa Public Health (OPH) as being: Compact, Complete, Connected, Cool, and Convivial (Ottawa Public Health, 2019). The project supports a compact, complete, and connected built environment through public transit which improves access for a variety of ages and incomes to shops and services, schools, and employment, as well as improved access to green spaces throughout the city including the NCC Greenbelt and Capital Pathways network. This complements the goal of creating complete streets, which support public health through the integration of transit with active modes of transportation such as walking and cycling, which are often included in the trip chain for transit users. OPH identifies active modes of transportation as contributing to overall healthy living including mental health and disease prevention (Ottawa Public Health, 2020).

Additionally, benefits of the project include a reduction in greenhouse gas (GHG) emissions and associated improvements to air quality, supporting cooler air temperatures through the increased capacity and service of the public transit network and the associated reduction of vehicle kilometres travelled through private and corporate fleet automobiles. GHG emissions are identified in the Climate Change Master Plan (2019) as a major contributing factor to climate change and have related implications to human health. The City of Ottawa tracks GHG emissions annually, with transportation accounting for 44% of community GHG emissions by sector and fleet accounting for 68% of corporate GHG emissions in the 2017-2018 inventory results (City of Ottawa 2019). The project has the potential to significantly reduce emissions, particularly those associated with commuters travelling from the rapidly growing suburbs of Barrhaven, Riverside South, and the surrounding rural area.

## **2.5 Conclusion**

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The justification for extending LRT to Barrhaven Town Centre and implementing the associated rail grade-separations is well established in the City’s OP and TMP, as well as within previous EA studies dating back to 1997. Extending LRT to Barrhaven Town Centre will support increased transit ridership as well as TOD-growth and development of compact and sustainable

communities, while reducing overall greenhouse gases and other contaminant emissions through the shift to electrically powered transit. Additional pedestrian and cycling infrastructure constructed as part of the project will encourage use of active transportation modes for transit access as well as supporting local trips within the corridor, allowing residents to reduce dependence on private vehicles and access housing, employment and services by sustainable travel modes

The proposed rail grade-separations will address the important TSB Recommendation R15-05 provided by the Transportation Safety Board of Canada in its Railway Investigation Report R13T0192 on the September 2013 VIA Rail/OC Transpo train and bus collision at the VIA Rail line/Southwest Transitway level crossing. This need is further established and confirmed by the recently completed study (BMRRGSS 2017).

An expanded LRT network, supported by rail grade-separations to create a safer environment, will increase the attractiveness of transit thereby helping the City achieve many of its key strategic directions and objectives. Combining the planning of LRT extension and rail grade-separations within this EA study enables the City to investigate integrated design solutions for both the rapid transit and roadway crossings, which are within the same Study Area.