Montreal-Blair Road Transit Priority Corridor Environmental Assessment Study

Environmental Study Report

February 2022

PARSONS

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Appendices

ACRONYMS

AA	Archaeological Assessment
AAQC	Ambient Air Quality Criteria
AC	Asbestos Concrete
ACG	Agency Consultation Group
AOIZ	Airport Operating Influence Zone
AUDP	Airport Urban Design Plan
AVDZ	Airport Vicinity Development Zone
BIA	Business Improvement Area
BMP	Best Management Practice(s)
BRT	Bus Rapid Transit
CDP	Community Design Plan
CEAA	Canadian Environmental Assessment Act
CI	Cast Iron
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSP	Corrugated steel pipes
CHR	Cultural Heritage Resource
DFO	Department of Fisheries and Oceans
DI	Ductile Iron
EA	Environmental Assessment
ENCG	Environmental Noise Control Guidelines
END	Endangered Species
EPNL	Effective Perceived Noise Levels
EPR	Environmental Project Report
ERIS	Ecolog Environmental Risk Information Services
ESA	Environmental Site Assessment
ESC	Erosion and Sediment Control
FA	Fisheries Act
FLUDTA	Federal Land Use, Design and Transaction Approval
GHG	Greenhouse Gas
GMP	Greenbelt Master Plan
HADD	Harmful Alteration, Disruption or Destruction of Fish Habitat

HC	Hydrocarbon
HVAC	Heating, ventilation and air conditioning
LoS	Level of Service
LRFP	Long-Range Financial Plan
LRT	Light Rail Transit
MECP	Ministry of the Environment, Conservation and Parks
MNRF	Ministry of Natural Resources and Forestry
MTCS	Ministry of Tourism, Culture and Sport
MTO	Ministry of Transportation
NCC	National Capital Commission
NEF	Noise Exposure Forecast
NEP	Noise Exposure Prediction
NHIC	Natural Heritage Information Centre
NOx	Nitrogen oxides
OEAA	Ontario Environmental Assessment Act
OESA	Ontario Endangered Species Act
OMCIAA	Ottawa Macdonald-Cartier International Airport Authority
OP	Official Plan
OPA	Official Plan Amendment
OWRA	Ontario Water Resources Act
PCG	Public Consultation Group
PE	Polyethylene
PFCC	Plan for Canada's Capital
PLA	Public Lands Act
PM	Particulate Matter
ppm	Parts per million
PTTW	Permit to take Water
PVC	Polyvinyl chloride
PSPC	Public Services Procurement Canada
RMA	Roadway Modification Approval
RMS	Root Mean Square
ROW	Right-of-way
RTC	Rapid Transit Corridor
RTTP	Rapid Transit and Transit Priority
RVCA	Rideau Valley Conservation Authority
SAR	Species at Risk

SWH	Significant Wildlife Habitat
SARA	Species at Risk Act
SARO	Species at Risk in Ontario
SC	Species of Special Concern
SPCSP	Structural plate corrugated steel pipe
SWM	Stormwater Management
THR	Threatened Species
TMP	Transportation Master Plan
TOD	Transit Oriented Development
TPAP	Transit Project Assessment Process
TSP	Transit Signal Priority
UCI	Unlined Cast Iron
UNA	Urban Natural Area
UNAEES	Urban Natural Areas Environmental Evaluation Study
UNF	Urban Natural Feature
ZBL	Zoning By-Law

EXECUTIVE SUMMARY

The City of Ottawa's 2013 Transportation Master Plan (TMP) identifies Montreal Road and Blair Road as transit priority corridors in the 2031 Affordable Network and Network Concept. As outlined in this report, the Montreal-Blair Road Transit Priority Corridor Environmental Assessment (EA) Study was conducted in accordance with the Municipal Class EA Schedule C process of the Ontario *Environmental Assessment Act*. The study resulted in the recommended plan and functional design for transit priority measures and active transportation improvements on Montreal Road (St. Laurent Boulevard to Shefford Road) and Blair Road (Montreal Road to Blair Station). The EA study identified the right-of-way (ROW) requirements that need to be protected from encroaching development for future implementation of the project.

The EA study assessed opportunities for both corridors to improve transit user experience that included options such as: physical measures like dedicated bus lanes and queue jump lanes; transit signal priority at intersections; improvements to bus stop locations and amenities; and improvements to transit connections between the Light Rail Transit (LRT) stations and other destinations in the community. The study looked to improve the transportation environment for all modes by including the Complete Streets design approach, improving multi-modal connectivity, and protecting space for tree planting and placemaking. The study resulted in a functional design for a transit priority corridor that is compatible with surrounding land uses and minimizes impacts on the surrounding environmental (social, natural/physical, and economic) conditions.

The recommended plan includes the following key benefits:

- Provide transit priority measures on Montreal Road and Blair Road;
  - Implement sections of bus-only lanes and queue jump lanes.
  - Support new bus routes and services.
  - Improve bus stop locations and amenities.
- Improve multi-modal connectivity to Blair and Montreal stations, as well as to adjacent communities, employment centres and commercial uses;
- Implement the Complete Streets design and improve active transportation facilities by providing new segregated cycle tracks, improved sidewalks and a new multi-use pathway;
- Implement the protected intersection design;
- Provide barrier-free access for all users and implement accessibility design standards;
- Improve road safety for all users;
- Maintain existing roadway capacity;
- Expand public realm and placemaking opportunities that include tree planting and landscaping;
- Consider and incorporate climate change mitigation and adaptation strategies; and,
- Encourage transit-oriented development and regeneration.

The recommended plan also includes the preferred location for a new bus loop and bus lay-up facility to support integration with the Montreal O-Train Station, enhance local bus operations and support future bus network changes.

Implementation of the project will require approximately 1.95 hectares of private and public property.

Financial Implications

Project costs were developed in accordance with the Council-approved Project Delivery Review and Cost Estimating process for implementing capital projects. The estimated cost for design, construction, property, public art, and contingencies in 2021 dollars is approximately $150 million. Funding will be subject to the City's future capital budget priorities.

Public Consultation/Input

Consultation included three rounds of Consultation Group meetings, two public open houses and numerous individual stakeholder meetings throughout the study. Meetings were held with the Agency Consultation Group (regulatory agencies, National Capital Commission, Hydro Ottawa, Hydro One and other utility companies, various City Departments), and the Business and Public Consultation Groups (landowners, businesses, community associations, interest groups). Feedback was also received from Indigenous peoples and the Accessibility Advisory Committee. The project website provided study information, and consultation events were advertised through newspapers, emails, buckslips and social media.

Overall, there is strong public support for this project. Some issues were raised during consultation that have been addressed, as described in this report. Concerns were raised about impacts to some commercial and residential properties from which land will be required. Property impacts have been minimized where possible as part of the refinement of the preferred design. Further refinement may be possible at the detailed design phase.

RÉSUMÉ

Dans son Plan directeur des transports (PDT) de 2013, la Ville d'Ottawa donne au chemin de Montréal et au chemin Blair la désignation de couloir prioritaire de transport en commun dans le réseau abordable et dans le concept du réseau de 2031. Comme l'indique ce rapport, l'Étude de la planification et de l'évaluation environnementale (EE) du couloir prioritaire de transport en commun sur le chemin de Montréal et le chemin Blair s'est déroulée conformément à l'évaluation environnementale municipale de portée générale (annexe C) prévue dans la Loi sur les évaluations environnementales de l'Ontario. Cette étude a donné lieu au plan recommandé et à la conception fonctionnelle des mesures prioritaires de transport en commun et des améliorations du transport actif sur le chemin de Montréal (entre le boulevard St-Laurent et le chemin Shefford) et sur le chemin Blair (entre le chemin de Montréal et la station Blair). L'étude de l'EE fait état de l'emprise à protéger contre l'empiétement des projets d'aménagement pour mettre éventuellement en œuvre le projet.

L'étude de l'EE a permis d'évaluer les perspectives d'aménagement de ces deux couloirs pour améliorer l'expérience offerte aux usagers des transports en commun, notamment en leur proposant des options comme : les mesures physiques, dont les voies réservées aux autobus et les sauts de file d'attente pour les autobus; la priorité des véhicules de transport en commun aux feux de circulation des intersections; les améliorations à apporter aux arrêts d'autobus et à leurs infrastructures; et enfin, les perfectionnements à apporter aux liaisons des transports en commun entre les stations du train léger sur rail (TLR) et d'autres destinations sur le territoire de la collectivité. Cette étude visait à améliorer l'environnement des transports pour tous les modes, en adoptant l'approche de la conception des rues complètes, en améliorant la connectivité multimodale et en protégeant l'espace consacré à planter des arbres et à aménager l'espace. L'étude a donné lieu à un modèle fonctionnel de couloirs prioritaires de transport en commun compatible avec les aménagements du territoire environnant et minore les incidences produites sur les conditions (sociales, naturelles ou physiques et économiques) de l'environnement voisin.

Le plan recommandé prévoit les principaux avantages suivants :

- aménager des mesures prioritaires de transport en commun sur le chemin de Montréal et sur le chemin Blair;
  - mettre en œuvre les sections des voies réservées aux autobus et les sauts de file d'attente pour les autobus;
  - promouvoir les nouveaux circuits et services d'autobus;
  - améliorer la localisation et les infrastructures des arrêts d'autobus;
- améliorer la connectivité multimodale avec la station Blair et la station Chemin-de-Montréal, ainsi qu'avec les collectivités voisines, les centres d'emploi et les établissements commerciaux;
- mettre en œuvre la conception des rues complètes et améliorer les infrastructures du transport actif en prévoyant de nouvelles voies cyclables réservées, des trottoirs améliorés et un nouveau sentier polyvalent;
- mettre en œuvre le modèle des intersections protégées;
- offrir à tous les usagers des moyens d'accès sans obstacle et mettre en œuvre les normes de la conception accessible;
- améliorer la sécurité routière pour tous les usagers;
- préserver la capacité routière existante;
- agrandir le domaine public et augmenter les occasions d'aménager l'espace en plantant des arbres et en paysageant les environs;
- étudier et intégrer les stratégies de maîtrise des dérèglements climatiques et d'adaptation aux changements climatiques;
- encourager l'aménagement et la régénération en fonction des transports en commun.

Le plan recommandé prévoit aussi la localisation privilégiée d'une nouvelle boucle pour autobus et d'une aire de stationnement des autobus afin de promouvoir l'intégration avec la station Chemin-de-Montréal de l'O-Train, de rehausser les opérations locales de transport par autobus et de favoriser les changements à apporter au réseau d'autobus.

Pour mettre en œuvre le projet, il faudra prévoir une superficie d'environ 1,95 hectare sur le domaine privé et sur le domaine public.

Répercussions financières

Les coûts du projet ont été calculés conformément au processus approuvé par le Conseil municipal pour l'Examen de la réalisation des projets et l'estimation des coûts afin de mettre en œuvre les projets d'infrastructures. Le coût estimatif de la conception, de la construction, de la propriété, de l'art public et des imprévus en dollars de 2021 est de l'ordre de 150 millions de dollars. Le financement sera subordonné aux priorités du budget des immobilisations projeté de la Ville.

Consultation et commentaires du public

La consultation prévoyait trois cycles d'assemblées du Groupe de consultation, deux séances publiques portes ouvertes et de nombreuses réunions avec les différents intervenants dans le cadre de l'étude. Des réunions ont eu lieu avec le Groupe de consultation des organismes (organismes réglementaires, Commission de la capitale nationale, Hydro Ottawa, Hydro One et d'autres entreprises de services publics, ainsi que différentes directions générales de la Ville), ainsi qu'avec le Groupe de consultation des entreprises et le Groupe de consultation du public (propriétaires fonciers, entreprises, associations communautaires et groupes d'intérêts). Les peuples autochtones et le Comité consultatif sur l'accessibilité ont également déposé des commentaires. Le site Web du projet donne de l'information sur l'étude; les activités de consultation ont été annoncées dans les journaux, dans les courriels, dans des papillons et sur les réseaux sociaux.

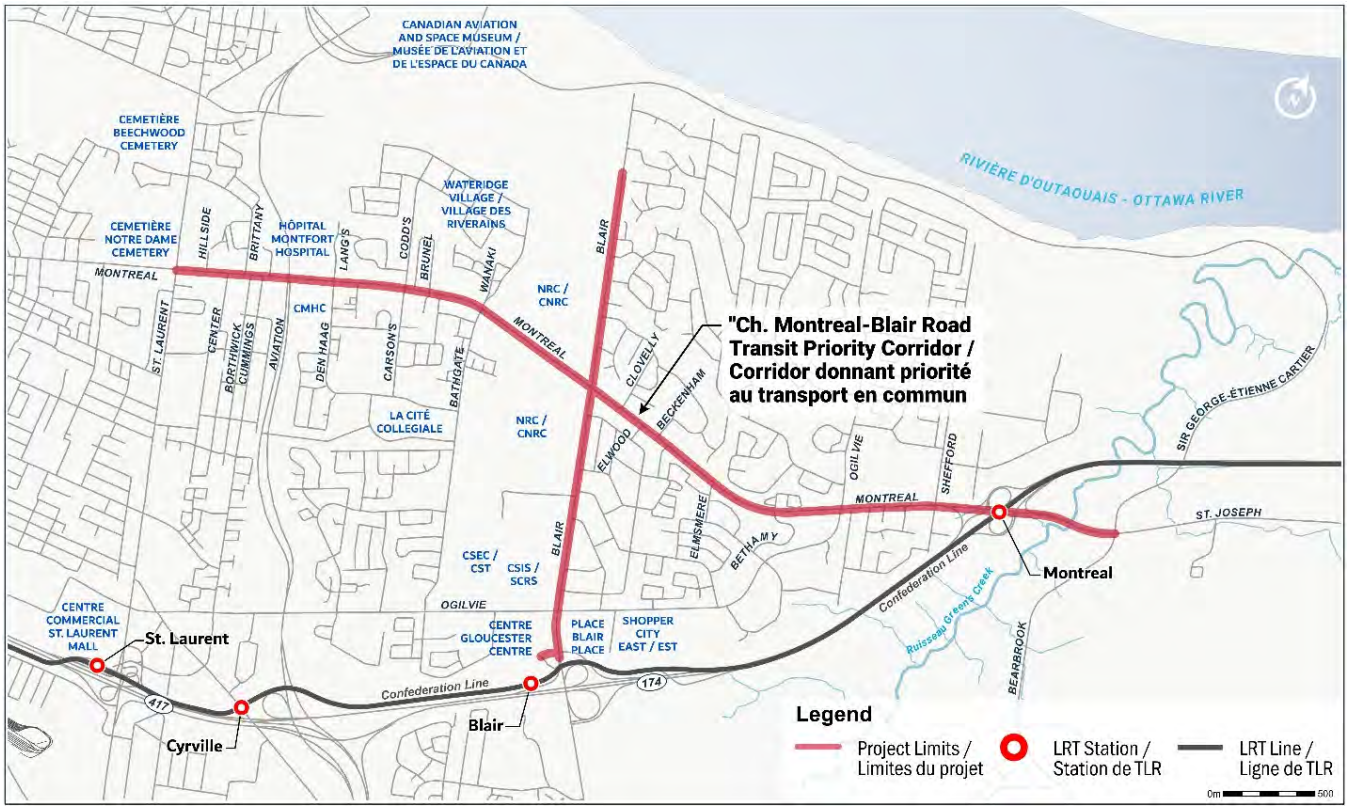
Dans l'ensemble, le public est très favorable à ce projet. Pendant la consultation, il a été question de certaines difficultés, sur lesquelles on s'est penchés, comme l'indique ce rapport. Des inquiétudes ont été exprimées à propos des incidences sur certaines propriétés commerciales et résidentielles dans lesquelles il faudra acquérir des terrains. On a minoré, dans toute la mesure du possible, les répercussions sur les propriétés dans le cadre de la mise au point du modèle de conception de prédilection. Il se pourrait que l'on puisse apporter d'autres perfectionnements dans la phase de la conception détaillée.

1.0 INTRODUCTION

The City of Ottawa is the proponent of the Montreal-Blair Road Transit Priority Corridor Planning and Environmental Assessment (EA) Study in accordance with the Ontario *Environmental Assessment Act*. This EA study has developed a Recommended Plan and functional design for transit priority measures and active transportation improvements on Montreal Road (St. Laurent Boulevard to Shefford Road) and Blair Road (Montreal Road to Blair Station). The recommended plan also includes the preferred location and design for a new bus loop and bus lay-up facility to support integration with the Montreal O-Train Station, enhance local bus operations and support future bus network changes.

The Study Area for this EA includes a section of Blair Road approximately 1.2 kilometres north of Montreal Road (**Figure 1-1**). Although Blair Road north of Montreal Road is not part of the Transportation Master Plan's Transit Priority Corridor, it was included in the study to assess the potential transit connection from Wateridge Village through the National Research Council to Blair Road.

Figure 1-1 Study Area



The EA Study Area for Montreal Road was extended eastward from Blair Road to Shefford Road to ensure connectivity and design tie-in to the future Montreal Station on Line 1 of Ottawa's O-Train network.

In addition, the Study Area was expanded to include the interchange of Montreal Road and St. Joseph Boulevard with Ottawa Road (OR) 174, and the intersection of St. Joseph Boulevard and Bearbrook Road to determine a suitable location for a new bus turnaround and layover facility (bus loop) near Montreal Station.

The need for transit priority measures and improvements to the corridor is well established in a number of the City's key strategic directions and objectives. The recommended plan will result in improvements to Montreal Road and Blair Road that are appropriate for the context of each corridor. The shared benefits to the implementation of the project will include:

- Provide transit priority measures;
  - Support new bus routes and services.
  - Improve bus stop locations and amenities.
- Improve multi-modal connectivity to Blair and Montreal stations, as well as to adjacent communities, employment centres and commercial uses;

- Improve active transportation facilities;
- Improve road safety for all users;
- Implement accessibility design standards;
- Maintain existing roadway capacity;
- Expand public realm and placemaking opportunities that include tree planting and landscaping;
- Consider and incorporate climate change mitigation and adaptation strategies; and,
- Encourage transit-oriented development and regeneration.

The Montreal Road corridor extends from St. Laurent Boulevard in the west to Shefford Road in the east, a distance of approximately 5.5 kilometres. It serves a diverse range of land uses including employment, commercial, residential and institutional, as well as the new Wateridge Village community. Employment lands include Canada Housing and Mortgage Corporation (CHMC), Montfort Hospital and National Research Council (NRC). The study area also includes the NCC's Aviation Parkway and its Capital Pathway, which intersects Montreal Road east of St. Laurent Boulevard. The east end of the study corridor connects to the planned roadway modifications as part of the future Montreal O-Train Station.

The Blair Road corridor extends from north of Montreal Road to the intersection of Blair Road and the westbound Ottawa Road (OR) 174 off-ramp at the existing Blair Station on O-Train Line 1, a distance of approximately 2.8 kilometres. Blair Road north of Ogilvie Road supports employment land use on the west side and residential on the east side. Federal employment lands include the NRC, Canadian Security Intelligence Service (CSIS) and Communications Security Establishment (CSE). South of Ogilvie Road to Blair Station, Blair Road supports employment and commercial lands on both sides. The south portion of the study area is within the Blair Transit Oriented Development (TOD) Plan Area that includes the Blair Mixed Use Centre.

The City's Official Plan (OP) includes Right-of-Way (ROW) protection of 37.5 metres for Montreal Road, and 30 metres for Blair Road from Montreal Road to Ogilvie Road. For Blair Road north of Montreal Road, its existing ROW varies from 20 to 23 metres.

The draft New OP identifies Montreal Road as a Transit Priority Corridor and Mainstreet Corridor that is part of the inner urban and outer urban transect policy areas. The southwest portion of the Montreal Road and St. Laurent Boulevard intersection is identified as the East Gateway in the Montreal Road District Secondary Plan. The draft New OP identifies Blair Road south of Montreal Road as a Transit Priority Corridor that is in the outer urban transect.

This EA study ties into several projects: the Montreal Road Revitalization project (North River Road to St. Laurent Boulevard); the Blair Road Widening for Transit Priority and High Occupancy Vehicle Lanes project (Blair Station to Innes Road); and the Stage 2 Light Rail Transit (LRT) project. Connecting the EA study's recommended plan into these projects will contribute to the overall improvements and connectivity to transit, pedestrian and cycling infrastructure of the broader area.

The outcome of the study will:

- Protect the roadway corridor from encroaching development;
- Provide transit priority measures where needed;
- Improve integrated mobility with Montreal and Blair O-Train stations;
- Improve active transportation facilities and accessibility features;
- Improve boulevard space for landscaping, tree planting and snow storage;
- Encourage transit-oriented development and regeneration of existing development; and,
- Guide planning and development of existing and future land uses.

As part of the study process, this Environmental Study Report (ESR) has been prepared to document activities and findings during the planning and functional design phase and to present the Recommended Plan for the project. The ESR provides the background and an overview of the study including the location and rationale for the proposed project; EA requirements; the public consultation process; the existing and future social, transportation, infrastructure and utilities, economic, natural and physical conditions; development and evaluation of alternative designs; the selection of preferred alternatives; the Recommended Plan; and an assessment of the effects of the project.

1.1 Project Background

The City's 2013 Transportation Master Plan (TMP) identifies Montreal Road and Blair Road as Transit Priority Corridors to accommodate future travel demand and meet modal share objectives with implementation currently anticipated beyond the TMP's 2031 horizon year.

Transit priority corridors complement the rapid transit network by providing improved city-wide transit access to major employment, commercial and institutional land uses.

The TMP identifies the following sections of the study corridor:

- Montreal Road from St. Laurent Boulevard to Blair Road; and Blair Road from Montreal Road to Blair Station, in the 2031 Affordable Rapid Transit and Transit Priority Network; and,
- Montreal Road from Blair Road to Ogilvie Road in the Network Concept.

The TMP describes this project as requiring road widening to provide continuous bus lanes along the corridor. These roadways are also identified in the TMP as cycling spine routes.

On May 2, 2018, Transportation Committee approved the Statement of Work for the Montreal-Blair Road Transit Priority Corridor Environmental Assessment (EA) Study (ACS2018-TSD-PLN-0005), enabling the Transportation Services Department to initiate the process to retain a consulting firm and launch the EA Study.

1.2 Environmental Assessment Process

The study was originally planned in accordance with the Transit Project Assessment Process (TPAP) Ontario Regulation 231/08 made under the Ontario *Environmental Assessment Act*. In consultation with the Ministry of the Environment, Conservation and Parks, it was determined that the Municipal class Environmental Assessment Schedule C process better suited the Study.

The Notice of commencement was issued in combination with the announcement of the commencement of the second and final public consultation event for the Study. The Study has addressed Phases 1 to 4 of the Municipal Engineers Association's Class EA Process (**Figure 1-2**).

Figure 1-2 MCEA Process

Phases 1 and 2 were originally completed as part of the 2013 Transportation Master Plan. As part of this Study, these two phases were reviewed and re-confirmed. Following completion of Phases 1 through 4, the Recommended Plan was presented and approved by the City's Transportation Committee and Council. The ESR is available for a 30-day public review period.

Following the review period and addressing comments received, the project will then be considered to have EA approval. It will be able to proceed to Phase 5 (implementation), once funding is in place.

1.3 Impact Assessment Act

The purpose of the *Impact Assessment Act (IAA) (2019)* is to protect the components of the environment that are within the legislative authority of the federal government from significant adverse environmental effects caused by a designated project. Additionally, the Act serves to promote cooperation and coordinated action between federal and provincial governments with respect to EAs.

Under Section 82 of the IAA: "*An authority must not carry out a project on federal lands, exercise any power or perform any duty or function conferred on it under any Act of Parliament other than this Act that could permit a project to be carried out, in whole or in part, on federal lands or provide financial assistance to any person for the purpose of enabling that project to be carried out, in whole or in part, on federal lands, unless (a) the authority determines that carrying out of the project is not likely to cause significant adverse environmental effects; or (b) the authority determines that the carrying out of the project is likely to cause significant adverse environmental effects and the Governor in Council decides, under subsection 90(3), that those effects are justified in the circumstances*".

As federal lands are required for various phases of project completion, an Environmental Effects Analysis of all the physical activities proposed on federal lands is required, under Section 82 of the IAA. No approvals from the National Capital Commission under the *National Capital Act* can be issued before these obligations are fulfilled. An Environmental Effects Analysis of a proposed project will determine the need to eliminate or mitigate adverse effects, or to recommend monitoring based on detailed design. **Section 6.9.2** details the impact assessment based on the Recommended Plan described herein. Many of the potential impacts that will also be analyzed through the federal Environmental Effects Analysis are included.

The proposed project will also require approval through the Federal Land Use, Design and Transaction Approvals (FLUDTA) process under the *National Capital Act*. Other federal authorities that may have an interest in the project include Public Services and Procurement Canada, Fisheries and Oceans Canada, the Canadian Transportation Agency, and Transport Canada. This Report was prepared in consultation with the NCC and is intended to form the basis for evaluation of environmental effects when the Federal EA requirements are met.

1.4 Consultation

1.4.1 Consultation Groups

The study proceeded under the direction of the City of Ottawa and benefitted from the direct involvement and guidance of three invited Study Consultation Groups. These included an Agency Consultation Group (ACG) consisting of City staff, and representatives from government agencies and approval bodies that may have an interest in the project; a Business Consultation Group (BCG) including business associations, institutions, landowners and commercial establishments/developers; and a Public Consultation Group (PCG) consisting of representatives from Community Associations and interested community groups relevant to the Study Area.

1.4.1.1 Agency Consultation Group

The ACG was formed to address the full range of technical issues and to comment on special studies as well as applicable procedures, legislation, and policies. ACG members included agencies and government department representatives from Municipal, Provincial and Federal levels, Indigenous Communities and utility companies. The following were invited to participate either by attending ACG meetings or providing comments during the EA process:

Internal ACG (City of Ottawa)

- Transportation Services Department
  - Transportation Planning
    - Transportation Environmental Assessments
    - Transportation Policy and Networks
  - Traffic Services
  - Traffic Operations
  - Road Safety and Traffic Investigations
  - OC Transpo
- Rail Construction Program Services
- Transit Customer Systems and Planning
- Planning, Infrastructure and Economic Development Department
  - Planning Services
- Corporate Real Estate Office
  - Realty Initiatives and Development
    - Environmental Remediation Unit
  - Realty Services
- Emergency and Protective Services Department
- Public Works and Environmental Services Department
- Recreation, Cultural and Facility Services Department
- Legal Services
- Ottawa Public Health

        - Development Review
    - Infrastructure Services
        - Asset management
    - Economic Development Services
    - Resiliency, Planning and Policy
        - Natural Systems and Rural Affairs
- Right of Way, Heritage and Urban Design Services

External ACG Representation

Federal

- National Capital Commission (NCC)
- National Research Council (NRC)
- Canada Mortgage and Housing Corporation (CMHC)
- Public Services and Procurement Canada (PCPC)
- Canada Lands Corporation (CLC)
- Environment and Climate Change Canada (ECCC)
- Canadian Security Intelligence Service (CSIS)
- Communications Security Establishment (CSE)

Provincial

- Ministry of the Environment, Conservation and Parks (MECP)
- Ministry of Agriculture, Food and Rural Affairs
- Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)
- Ministry of Natural Resources and Forestry (MNRF) (now Ministry of Northern Development, Mines, Natural Resources and Forestry)

Regional

- Rideau Valley Conservation Authority (RVCA)
- Hydro Ottawa Limited
- Transport Action Canada
- Rogers
- Hydro One Networks Inc. "Hydro One"
- Bell Canada
- Enbridge

Meeting agendas and notes are contained in Error! Reference source not found.. **Table 1-1** outlines the meeting dates and main agenda topics.

Table 1-1 Agency Consultation Group Meetings

Meeting #	Date	Main Agenda Topics
1	June 6, 2019	Study Overview and Objectives, Study Process and Schedule, Need and Opportunities, Existing Corridor Conditions, Planning and Design Principles, Identification of Alternative Solutions, Key Design Considerations and Next Steps.
2	November 19, 2019	Study Overview and Objectives, Study Process and Schedule, What We've Heard so Far, Need and Opportunities, Existing Corridor Conditions, Planning and Design Principles, Evaluation of Alternative Solutions, Identification of Alternative Designs and Key Design Considerations.
3	March 30, 2021	Evaluation of alternative designs, Preliminary Preferred Design for Montreal Road and Blair Road, Preliminary impact assessment, Implementation and staging recommendations and Next steps.

1.4.1.2 Business Consultation Group

The BCG was formed to review work completed to-date and to provide comments on study activities, issues and concerns that reflect each group's interests and values. Throughout the study, BCG membership was updated to capture changes to those with business interest in the Study Area. The BCG consisted of representatives from:

- 120 Den Haag
- 1651-1657 Montreal Road

- 630 Montreal Road
- 795-799 Montreal Road
- 841 Montreal Road
- 458-470 Montreal Road
- AGR Insurance
- Beacon Hill Motel
- Bethamy Woods and 2111 Montreal Road Condo Management Company
- Braceology
- CGH Transportation
- Chimney Hill Way Condominium
- Christopher Simmonds Architect
- Commercial retail plaza (no name)
- Deerpark Property Management
- Director, Groupe Sovima
- Elmsmere Villa Retirement Residence
- Fotenn for 1649 Montreal Road/741Blair Road development
- Halley's Service Centre
- Manager of Bethamy Woods
- Montfort Residence
- Ogilvie Square
- Ottawa Eye Clinic
- President of 2111 Montreal Road condo community
- President of Bethamy Woods
- Richcraft Properties
- Shepherds of Good Hope
- St. Brothers Andre School
- Circle K owner
- Vanier BIA
- WN Property Management

Meeting agendas and notes are contained in Error! Reference source not found.. **Table 1-2** outlines the meeting dates and main agenda topics.

Table 1-2 Business Consultation Group Meetings

Meeting #	Date	Main Agenda Topics
1	June 13, 2019	Study Overview and Objectives, Study Process and Schedule, Need and Opportunities, Existing Corridor Conditions, Planning and Design Principles, Identification of Alternative Solutions, Key Design Considerations and Next Steps.
2	November 20, 2019	Study Overview and Objectives, Study Process and Schedule, What We've Heard so Far, Need and Opportunities, Existing Corridor Conditions, Planning and Design Principles, Evaluation of Alternative Solutions, Identification of Alternative Designs and Key Design Considerations.
3	April 14, 2021	Evaluation of alternative designs, Preliminary Preferred Design for Montreal Road and Blair Road, Preliminary impact assessment, Implementation and staging recommendations and Next steps.

1.4.1.3 Public Consultation Group

The PCG was formed to enable community and interest groups to provide direct input to the study and to comment on technical and local opportunities and concerns. PCG members included representatives from City wards adjacent to the corridor, interest groups and City of Ottawa advisory committees. Representation included, but was not limited to:

- Ward 13 Councillor Rawlson King
- Ward 11 Councillor Tim Tierney
- Ward 12 Councillor Mathieu Fleury
- Arts, Culture, Heritage and Recreation Advisory Committee
- Beacon Hill Community Association
- Bike Ottawa
- Cardinal Glen Community Association
- Citizens for Safe Cycling
- Council on Aging Of Ottawa
- Ecology Ottawa
- Fairhaven Community Association
- Forbes/Cummings Community Association
- Greenspace Alliance of Canada's Capital
- Healthy Transportation Coalition
- Healthy Transportation Ottawa
- Lotus Community Corner
- Manor Park Community Association (MPCA)
- Manor Park Community Council (MPCC)
- MP, Mona Fortier Ottawa-Vanier
- Overbrook Community Association
- Rideau-Rockcliffe Community Resource Centre
- Rothwell Heights Community Interest Group
- Rothwell Heights Property Owners Association
- Rothwell United Church
- Sanad Collective - Mosque
- Accessibility Advisory Committee
- Vanier Community Association (VCA)

- Wateridge Village Community Association

Meeting agendas and notes are contained in Error! Reference source not found.. **Table 1-3** outlines the meeting dates and main agenda topics.

Table 1-3 Public Consultation Group Meetings

Meeting #	Date	Main Agenda Topics
1	June 13, 2019	Study Overview and Objectives, Study Process and Schedule, Need and Opportunities, Existing Corridor Conditions, Planning and Design Principles, Identification of Alternative Solutions, Key Design Considerations and Next Steps.
2	November 20, 2019	Study Overview and Objectives, Study Process and Schedule, What We've Heard so Far, Need and Opportunities, Existing Corridor Conditions, Planning and Design Principles, Evaluation of Alternative Solutions, Identification of Alternative Designs and Key Design Considerations.
3	April 14, 2021	Evaluation of alternative designs, Preliminary Preferred Design for Montreal Road and Blair Road, Preliminary impact assessment, Implementation and staging recommendations and Next steps.

1.4.2 Public Open Houses

Two public open houses (POH) were held at key stages during the study to obtain feedback from the general public on the project information being provided. These events presented work on confirming the problem or opportunity (needs assessment) and evaluation of alternative solutions, evaluation of alternative designs, and presenting the Preliminary Recommended Plan for the corridor. The first POH was organized to allow informal viewing of display panels about the project and examination of resource material related to the various stages of the EA. All information was available in both official languages. Study Team members were present to answer questions and explain various aspects of the study as well as work completed to-date. The second public consultation event was organized online for a period of four weeks due to the public health guidelines for COVID-19. Presentation boards, and a video presenting materials for the public and a comment/questionnaire was provided to obtain feedback on the City of Ottawa's study's website. POH content and summaries are contained in Error! Reference source not found.. **Table 1-4** outlines POH dates and main presentation topics.

Table 1-4 Public Open Houses

Meeting #	Date	Main Agenda Topics
1	December 4, 2019	Study Overview and Objectives, Study Process and Schedule, Need and Opportunities, Existing Corridor Conditions, Planning and Design Principles, Identification and Evaluation of Alternative Solutions, Preliminary Preferred Solutions, Key Design Considerations, Alternative Designs, Evaluation of Alternative Designs - Criteria and Methodology and Next Steps.
2	May 17 - June 11, 2021	A review of study objectives, Need and Opportunities, Existing Conditions and Evaluation of Alternative Solutions, Evaluation of Alternative Designs, Preliminary Preferred Design for Montreal Road and Blair Road, Preliminary impact assessment, Implementation and staging recommendations and Next steps.

1.4.3 Individual Stakeholder Meetings

During the study, the Study Team met with individual stakeholders and landowners to discuss specific elements of the study and proposed design. Summaries of key comments provided are included in Consultation Summary Reports provided in **Appendix A**.

These individual stakeholder meetings focused on topics such as the impact on adjacent properties, how the project relates to specific policies or mandates of agencies, connections to employment and residential land uses and future development opportunities.

Table 1-5 outlines the individual stakeholder meeting dates and main agenda topics. More details regarding the meetings can be found in Annex 4 of **Appendix A**.

Table 1-5 Individual Stakeholder Meetings

Meeting #	Date	Stakeholder	Main Agenda Topics
1	February 8, 2019	Canada Lands Corporation	Project Introduction, EA Study scope, timelines, objectives, Wateridge Development Plans and future transit service
2	February 28, 2019	National Research Council Canada (NRC)	Project Introduction, EA study scope, timelines, objectives and key challenges, NRC Campus Development Plans, OC Transpo service to NRC, Connection via Wateridge Village
3	April 15, 2019	Hôpital Montfort	Project Introduction, EA study scope, timelines, objectives and key challenges, Existing transportation services to Montfort Hospital, Montfort Hospital – current situation and master plan, Connections to Wateridge Village
4	September 18, 2019	CSE and CSIS	Project Introduction, EA study scope, timelines, objectives and key challenges, highlights from the CG presentation in June 2019
5	October 16, 2019	OC Transpo, Wateridge Village Community Association, Rothwell Heights Property Owners' Association, National Research Council, and Canada Lands Company	Project Introduction, EA study team's status update, Existing transportation services to NRC, Wateridge and Rothwell Heights, Stakeholders' input on opportunities for improved transportation services
6	November 1, 2019	Canada Lands Company and OC Transpo	Brief overview of EA study scope, schedule and work completed to date, Update on phasing of the Wateridge Village development, Future transit service options through Wateridge, including a possible connection to Blair Road (north of Montreal Road) through the NRC campus, CLC's plans for Hemlock Road, including a possible connection from Aviation Parkway
7	April 16, 2021	875 Montreal Road	Preliminary preferred design and property impacts
8	April 19, 2021	NCC	Preliminary preferred design, issues and property impacts
9	April 22, 2021	981 Gulf Place, Concorde Apartments (Realstar Management)	Preliminary preferred design and property impacts
10	April 22, 2021	NRC	Preliminary preferred design and property impacts
11	April 22, 2021	Richcraft	Preliminary preferred design and property impacts
12	April 23, 2021	CMHC	Preliminary preferred design and property impacts
13	May 10, 2021	1651-1657 Montreal Road (commercial plaza)	Preliminary preferred design and property impacts
14	May 12, 2021	2111 Montreal Rd condominium corporation and management; Reid Management Company	Preliminary preferred design and property impacts
15	May 12, 2021	Bethamy Woods condominium corporation and management; Reid Management Company	Preliminary preferred design and property impacts
16	May 13, 2021	651 Montreal Road (East Motors)	Preliminary preferred design and property impacts
17	May 13, 2021	680 Montreal Road (Ottawa Eye Clinic)	Preliminary preferred design and property impacts
18	May 14, 2021	644 Montreal Road (Martel Law)	Preliminary preferred design and property impacts
19	May 14, 2021	45A-53P Sumac Street and 896-914 Elmsmere Road Condominium Corporation; Deerpark Management	Preliminary preferred design and property impacts

Meeting #	Date	Stakeholder	Main Agenda Topics
20	May 19, 2021	949 Montreal Road (Marochel Manor)	Preliminary preferred design and property impacts
21	May 26, 2021	Hydro One	Preliminary preferred design and property impacts
22	June 8, 2021	795-799 Montreal Road condominium owners	Preliminary preferred design and property impacts
23	June 10, 2021	1668 Montreal Road (Beacon Hill Motel)	Preliminary preferred design and property impacts
24	June 21, 2021	800 Montreal Rd (120 Den Haag)	Preliminary preferred design and property impacts
25	July 21, 2021	598 Montreal (Circle K)	Preliminary preferred design and property impacts
26	July 22, 2021	865 Montreal Road (Halley's Service Centre)	Preliminary preferred design and property impacts
27	September 28, 2021	458-470 Montreal Road (Mark Motors)	Recommended plan and property impacts

1.4.4 Indigenous Consultation

The Communities consulted as part of the study were determined in coordination between the City of Ottawa and the MECP. Communities consulted include: Ottawa Region Métis Council, Algonquins of Ontario, Algonquins of Pikwàkanagàn, Kitigan Zibi Anishinabeg, and the Ottawa Métis Council and the Métis Nation of Ontario.

Initial contact was made to inform each group of the project and identify opportunities for involvement. Official notices were also sent through the study process. The ESR was made available for review by all the identified Communities. Consultation was achieved through email with representatives of the Communities identified for this study. Correspondence that was sent/received is contained in Error! Reference source not found..

1.4.5 City of Ottawa Website

The City of Ottawa developed and maintained a project website with consultation materials for the study, key milestones, and the overall EA process. Information posted on the website was also formatted in a manner compatible with the City's accessibility guidelines for on-line graphics, videos, and printed materials.

English: www.ottawa.ca/montrealblairroad

French: www.ottawa.ca/cheminmontrealblair

1.5 Report Organization

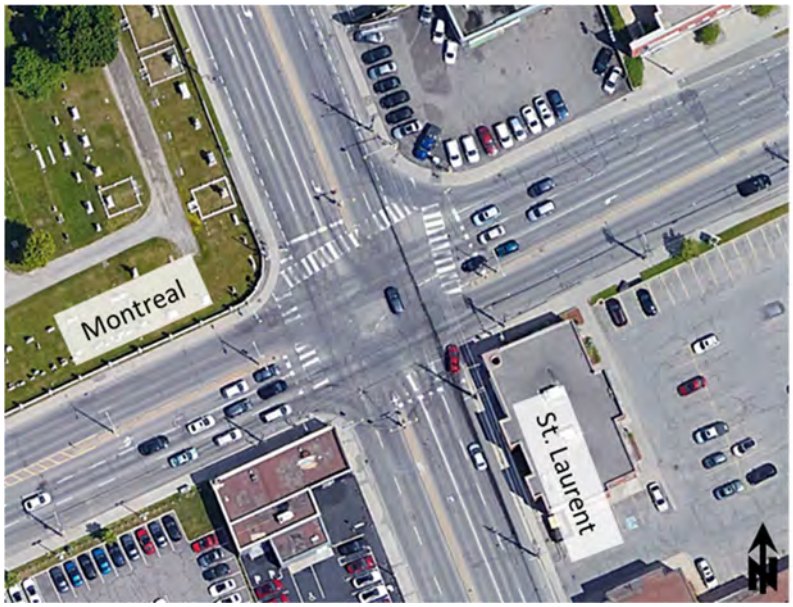
The purpose of this ESR is to document the study rationale, the planning, design, and consultation processes of the project, and make that documentation available for review by the public and review agencies. The report consists of the following sections:

- Executive Summary
- Introduction
- Project Need and Opportunities
- Existing Environmental Conditions
- Evaluation of Alternative Solutions
- Evaluation of Alternative Designs
- Recommended Plan and Assessment
- Recommended Plan - Functional Design Drawings
- Implementation and Approvals
- Conclusion
- References

The Appendices contain the technical reports and technical documentation prepared throughout the course of the study. These reports and documentation contributed to the decision-making process and the development of recommendations that led to the selection of the preferred design (Recommended Plan).

2.0 PROJECT NEED AND OPPORTUNITIES

This section outlines the need and opportunities for this project, which is based on the City of Ottawa's planning policies and studies, current and future transit demand, transit network requirements and land use objectives.



2.1 Existing Transportation Conditions

2.1.1 Major Roadways

Montreal Road is an east-west arterial roadway, which extends from the Rideau River in the west to OR 174 in the east. The roadway forms part of the broader Wellington-Rideau-Montreal-St. Joseph-Old Montreal corridor which extends from downtown Ottawa to the City's eastern boundary. Montreal Road has a four-lane cross-section between St. Laurent Boulevard and Shefford Road (the EA study limits). There are two segments of Montreal Road which currently have a two-way left turn lane (TWLTL): between St. Laurent Boulevard and Aviation Parkway, the TWLTL provides for full-movement vehicular access at unsignalized intersections with local streets and to/from properties fronting onto Montreal Road; and between LeBoutillier Street and west of the Codd's/Carson's intersection, where the TWLTL provides access to properties fronting onto Montreal Road. Auxiliary turn lanes are provided at major intersections throughout the corridor. Montreal Road has a posted speed limit of 50km/h from Eglise Street to Aviation Parkway and 60km/h from Aviation Parkway to OR 174.

Ogilvie Road is an east-west arterial roadway which extends from Quincy Avenue to St. Laurent Boulevard where it continues as Coventry Road. Ogilvie Road has a four-lane cross-section. Auxiliary turn lanes are provided at major intersections, and it has a posted speed limit of 60 km/h.

Aviation Parkway is a north-south federal arterial roadway, which extends from Highway 417 in the south to Sir George-Etienne Cartier Parkway in the north. Aviation Parkway has a four-lane divided cross-section with auxiliary turn-lanes provided at major intersections. The posted speed limit within the study area is 60 km/h.

St. Laurent Boulevard is a north-south arterial roadway which extends from Sandridge Road to Don Reid Drive. St. Laurent Boulevard has a two-lane cross section north of Montreal Road with a posted speed limit of 50 km/h and a four-lane divided cross-section south of Montreal Road with a posted speed limit of 60 km/h. Auxiliary turn lanes are provided at major intersections.

Blair Road is a north-south arterial roadway which extends from Massey Lane to Innes Road. Blair Road has a two-lane cross section north of Ogilvie Road with a posted speed limit of 50 km/h and a six-lane divided cross-section south of Ogilvie Road with a posted speed limit of 70 km/h. Auxiliary turn lanes are provided at major intersections.

All other roadways within the study area are either collectors or local roadways. The unposted speed limit was assumed to be 50 km/h. In all cases, auxiliary turn lanes are provided at intersections to major roads.

2.1.2 Major Intersections

St. Laurent/Montreal

The St. Laurent/Montreal intersection is a signalized four-legged intersection. The east approach consists of left-turn lane, two through lanes and a right-turn lane. The west, south and north approaches consist of a single left-turn lane, two through lanes and no right-turn lanes. The east and north approaches have pocket bike lanes. Trucks are prohibited northbound. All other movements are permitted at this location.

Aviation/Montreal

The Aviation/Montreal intersection is a signalized four-legged intersection. The eastbound and westbound approaches consist of a left-turn lane, two through lanes and a channelized right-turn lane. The north and south approaches consist of a left-turn lane, a single through lane and a channelized right-turn lane. A pocket bike lane is provided on both the east and west legs of the intersection. All movements are permitted at this location.

Blair/Montreal

The Blair/Montreal intersection is a signalized four-legged intersection. The east approach consists of a single auxiliary left-turn lane, two through lanes and a right-turn lane. The west approach consists of a single auxiliary left-turn lane, two through lanes and a channelized right-turn lane. The south approach consists of a single auxiliary left-turn lane, a through lane and a right-turn lane. The north approach consists of a single auxiliary left-turn lane, a through lane and a channelized right-turn lane. There are no cycling facilities provided at this intersection. All movements are permitted at this location.

Montreal/Ogilvie

The Montreal/Ogilvie intersection is a signalized four-legged intersection. All approaches consist of a single auxiliary left-turn lane, two through lanes, and a channelized right-turn lane. A pocket bike lane is provided on both the east and south legs of the intersection. All movements are permitted at this location.

Shefford/Montreal

The Shefford/Montreal intersection is a signalized four-legged intersection. The east approach consists of a single left-turn lane, two through lanes and a channelized right-turn lane. The west approach consists of a single auxiliary left-turn lane, two through-lanes and a right-turn lane. The south approach consists of a single left-turn lane and a shared right-through lane. The north approach consists of a double left-turn lane, a through lane and a channelized right-turn lane. A curb bike lane is provided on both the east and west legs of the intersection. All movements are permitted at this location.

Blair/Ogilvie

The Blair/Ogilvie intersection is a signalized four-legged intersection. The east approach consists of double left-turn lanes, a through lane and a shared right-through lane. The west approach consists of a single auxiliary left-turn lane, two through-lanes and a channelized right-turn lane. The south approach consists of double left-turn lanes a through lane and a channelized right-turn lane. The north approach consists of a single left-turn lane, a through lane and a shared right-through lane. A pocket bike lane is provided on the west and north legs of the intersection. All movements are permitted at this location.

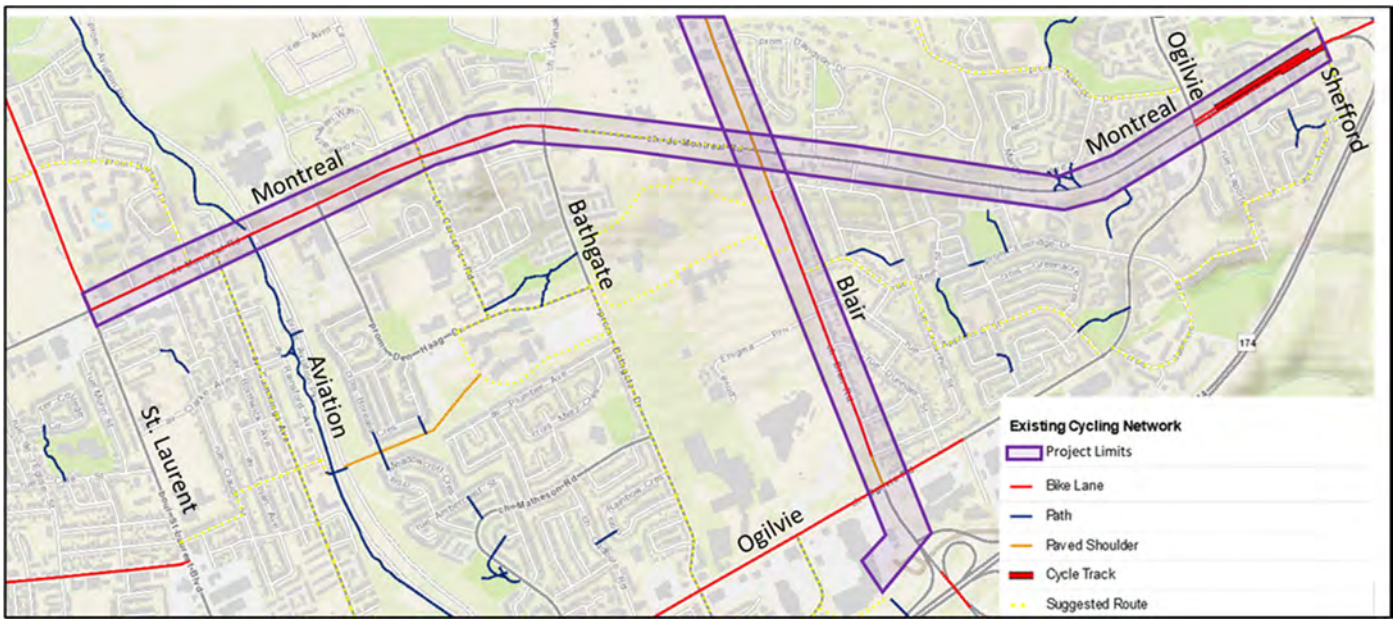
2.1.3 Pedestrian Network

Existing pedestrian facilities (sidewalks) are found on both sides of Montreal Road within the study area. Blair Road has a sidewalk only on the east side of the roadway between Nicol Street and Ogilvie Road. From Ogilvie Road to the Gloucester Center entrance, there are sidewalks on both sides of the road. St. Laurent Boulevard has pedestrian facilities on both sides of the roadway between Montreal Road and McArthur Avenue. A multi-use pathway is located on the west side of Aviation Parkway and extends from Sir George Etienne Cartier Parkway in the north to Ogilvie Road in the south.

2.1.4 Cycling Network

The existing cycling network within the study area is shown in **Figure 2-1**.

Figure 2-1 Existing Cycling Network



2.1.5 Transit Network

Within the Montreal Road Corridor between St. Laurent Boulevard and Ogilvie Road, there are 6 bus routes which include:

- Route 12: on Montreal Road from St. Laurent Boulevard to Ogilvie Road
- Route 17: on Montreal Road from St. Laurent Boulevard to Carsons/Codds Road
- Route 20: on Montreal Road from St. Laurent Boulevard to Montfort Hospital
- Route 23: on Montreal Road from Blair Road to Elwood Street on the eastbound direction only
- Route 27: on Montreal Road from Cummings Avenue to Carsons/Codds Road
- Route 129: on Montreal Road from Den Haag Drive to Carsons/Codds Road on the eastbound direction only

Existing transit travel times along Montreal Road within the study area have been collected by OC Transpo and are summarized in **Table 2-1** and **Table 2-2** for eastbound and westbound travel respectively. Note that data for OC Transpo route #20 was unavailable and some routes only serve the peak hour direction of travel.

Table 2-1 Eastbound Transit Travel Times – Montreal Road

		Eastbound							
		Weekday AM Peak				Weekday PM Peak			
Transit Route	Length (km) / # Stops	Min. (mm:ss)	Max. (mm:ss)	Avg. (mm:ss)	Minutes / km	Min. (mm:ss)	Max. (mm:ss)	Avg. (mm:ss)	Minutes / km
Route 12	4.4km/17 stops	04:12	45:05	12:45	**02:54**	04:02	73:53	13:34	**03:05**

Route 17	1.28km/7 stops	02:04	39:39	04:49	**03:45**	-	-	-	**-**
Route 23	0.48km/2 stops	00:38	03:18	01:26	**03:00**	00:36	07:05	01:24	**02:58**
Route 27	0.78km/4 stops	01:32	11:39	03:32	**04:34**	-	-	-	**-**
Route 129	0.45km/2 stops	00:13	39:44	01:56	**04:18**	00:14	15:17	03:02	**06:43**
		Average travel time (minutes per km)			**03:42**				**04:15**

Table 2-2 Westbound Transit Travel Times – Montreal Road

		Westbound							
		Weekday AM Peak				**Weekday PM Peak**			
Transit Route	**Length (km) / # Stops**	**Min. (mm:ss)**	**Max. (mm:ss)**	**Avg. (mm:ss)**	**Minutes / km**	**Min. (mm:ss)**	**Max. (mm:ss)**	**Avg. (mm:ss)**	**Minutes / km**
Route 12	3.4km/17 stops	03:45	41:13	10:23	**03:04**	03:51	48:48	11:37	**03:25**
Route 17	0.75km/3 stops	-	-	-	**-**	00:50	07:05	02:34	**03:26**
Route 27	0.47km/2 stops	-	-	-	**-**	00:42	04:13	01:59	**04:16**
Route 129	0.45km/3 stops	-	-	-	**-**	00:48	03:13	01:30	**03:20**
		Average travel time (minutes per km)			**03:04**				**03:36**

On average, OC Transpo buses travel at a rate of 3 to 4 minutes per kilometer (15-20 km/h). There is a significant difference between minimum and maximum travel times on most routes, which suggests a high degree of variability in traffic congestion on Montreal Road during the peak periods. This variability directly affects the reliability of transit service on Montreal Road, since buses must share travel lanes with general traffic.

2.1.6 Road Safety

Collision summary of the data is as follows:

- 1045 total collisions were recorded within the study area over a five year period, with the majority involving property damage only (823 collisions or 79% of total collisions)
- 3 collisions resulted in fatal injuries, of which one involved a pedestrian. One occurred at Montreal Road/Bathgate Drive intersection during a turning movement. Two occurred between Bathgate and Elwood on Montreal Road in single vehicle (other).
- 471 collisions (45%) were rear-end type, followed by 168 (16%) turning movement.
- 768 collisions were reported at 19 different intersections and 277 collisions were reported within 5 distinct road segments

<u>Intersections:</u>

To help quantify the relative safety risk at intersections within the study area, an industry standard unit of measure for assessing collisions at an intersection was used based on the number of collisions per million entering vehicles (MEV). An MEV value greater than 1.00 indicates a relatively high frequency of collisions; however, it does not explain the type or severity of collision. A secondary analysis is done to determine the severity of collision by representing the number of personal injuries as a percentage of the total number of collisions at a given intersection (%PIR).

Locations with more than 6 recorded collisions were evaluated for MEV's and/or personal injury rates. A high propensity (MEV > 1.00 or %PIR > 30%) would signal a potential intersection design deficiency or other contributing factor, such as high amounts of congestion, excessive speeds, poor lighting, poor weather conditions, high amount of entry/exit driveways etc.

Table 2-3 summarizes all the intersections considered high risk based on frequency (achieving an MEV value higher than one) and/or based on severity (having 30% or higher of collisions resulting in personal injury).

Table 2-3 Collision Analysis Intersections

Intersection	Number of Collisions	MEV (collisions/million)	% PIR
Montreal/St. Laurent	117	1.37	18%
Blair/OR174 Ramp 61	100	1.24	27%
Montreal/Aviation	94	1.07	23%
Montreal/Cummings	28	0.44	36%
Montreal/Bathgate/Burma	38	0.75	3%*

Note: Values in red exceed MEV or %PIR threshold
**Montreal/Bathgate/Burma has a fatal collision*

Road Segments:

Five distinct road segments were analyzed and are as follows:

- Section 1: Montreal Road from St Laurent to Bathgate/Burma. This road segment has multiple mixed-use driveways along the corridor with closely spaced traffic signals and a shared east-west left turn central lane.
- Section 2: Montreal Road from Bathgate/Burma to Ogilvie. This road segment features a more boulevard like style roadway with median separated east-west traffic for large segments of the road. There are long segments of road with no driveways.
- Section 3: Montreal Road from Ogilvie to OR174. This road segment has multiple mixed-use driveways, particularly on the south side of Montreal Road. Parts of the roadway have a median separating the east-west traffic.
- Section 4: Blair Road from OR174 to Ogilvie. This road segment has no driveways and north-south traffic is separated by a median.
- Section 5: Blair Road from Ogilvie to Montreal Road. This road segment features multiple residential driveways and local road connections. This segment of road has at grade bike lanes on both sides of the roadway and a single car lane per direction.

Table 2-4 Collision Analysis Road Segments

Section	Number of Collisions	Length Segment	% PIR	Fatal Collisions
1: Montreal Road from St Laurent to Bathgate/Burma	101	1.8km	27%	0
2: Montreal Road from Bathgate/Burma to Ogilvie	59	2.5km	17%	2
3: Montreal Road from Ogilvie to OR174	27	0.9km	4%	0
4: Blair Road from OR174 to Ogilvie	9	0.5km	11%	0
5: Blair Road from Ogilvie to Montreal Road	17	1.3km	29%	0

Note: Values in red exceed %PIR threshold

Summary:

Generally, locations that experience higher traffic congestion were observed to have a greater propensity and severity of collisions. Notably, the segment of Montreal Road between St. Laurent and Bathgate, which contains four of the five the critical intersections within the study area. Beyond traffic congestion, the access management along Montreal Road west of Aviation may also factor into the collision results. There are several uncontrolled, tightly spaced driveways between signalized intersections that are accessible via a two-way left-turn lane, which during peak periods can exacerbate congestion and collision risks, although the data does not suggest there is a current safety concern with the two-way left-turn lane operation.

The intersection of Montreal Road and Aviation Parkway was included in the City of Ottawa's Cycling Safety Review of High-Volume Intersections study. This study identified the need for improvements, which were addressed as part of this EA study.

2.1.7 Existing Traffic Volumes

Existing peak hour traffic volumes within the study area were provided by the City of Ottawa. A summary of this data has been provided in **Figure 2-2**.

Figure 2-2 Existing Peak Hour Traffic Volumes Within the Study Area

2.1.8 Intersection Capacity Analysis

The methodology employed to evaluate intersection capacity within the study area was based on City of Ottawa Transportation Impact Assessment Guidelines (2017). For signalized intersections, the Level of Service (LOS) defines operational conditions within a traffic stream and their perception by motorists. LOS 'A' represents the best operating conditions and LOS 'E' represents the level which the intersection or an approach to the intersection is carrying the maximum traffic volume that can, practicably, be accommodated. LOS 'F' indicates that the intersection is operating beyond its theoretical capacity.

For an un-signalized intersection, the LOS is defined in terms of the average movement delays at the intersection, which is the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line at the intersection. The City has developed criteria as part of the Transportation Impact Assessment Guidelines, which relate a LOS designation to be defined range. These criteria are shown in **Table 2-5**.

Table 2-5 LOS Criteria for Intersection

LOS	Signalized Volume to Capacity Ratio (v/c)	Unsignalized Delay (seconds)
A	0 to 0.60	<10
B	0.61 to 0.70	>10 and <15
C	0.71 to 0.80	>15 and <25
D	0.81 to 0.90	>25 and <35
E	0.91 to 1.00	>35 and <50
F	>1.00	>50

A LOS 'D' or better is considered acceptable based on City Standards. A LOS 'E' or 'F' may only be considered at intersections location within the Ottawa's Urban Core or in highly constrained conditions. A summary of the existing intersection capacity analysis is shown in **Table 2-6**Error! Reference source not found. below.

Table 2-6 Existing Intersection Performance

		Weekday AM Peak (PM Peak)				
		Critical Movement		Overall Performance		
Intersection	LOS	Max. v/c or avg. delay (s)	Movement	Delay (s)	LOS	v/c
St. Laurent/Montreal	D(F)	0.90(1.07)	SBL(SBL)	42.3(51.9)	C(D)	0.73(0.90)
Retail Access/Montreal	C(C)	0.78(0.80)	NBT(NBT)	17.8(17.1)	A(A)	0.43(0.52)
Brittany/Montreal	C(C)	0.79(0.74)	SBL(SBL)	20.7(11.4)	B(B)	0.63(0.61)
Montreal/Cummings	A(A)	0.53(0.58)	WBT(NBT)	10.2(16.5)	A(A)	0.52(0.55)
Aviation/Montreal	E(F)	0.91(1.40)	SBT(WBL)	35.2(65.5)	C(E)	0.80(0.98)
Montfort/Montreal	B(B)	0.69(0.62)	WBT(WBT)	15.6(17.5)	B(B)	0.67(0.61)
Den Haag/Montreal	D(B)	0.82(0.61)	NBL(NBL)	14.8(13.4)	A(A)	0.58(0.49)
Carsons/Codd's/Montreal	A(A)	0.57(0.48)	NBL(EBT)	13.8(9.5)	A(A)	0.49(0.46)
Bathgate/Burma/Montreal	A(A)	0.53(0.59)	WBL(EBT)	18.2(17.3)	A(A)	0.47(0.57)
Blair/Montreal	C(C)	0.71(0.73)	NBL(NBL)	14.5(17.2)	A(A)	0.59(0.56)
Elmwood/Montreal	A(A)	0.53(0.52)	WBT(EBT)	6.2(5.8)	A(A)	0.52(0.50)
Elmsmere/Montreal	A(A)	0.51(0.50)	WBT(EBT)	3.8(4.7)	A(A)	0.50(0.48)
Bethany/Montreal	A(A)	0.45(0.44)	WBT(EBT)	6.5(2.9)	A(A)	0.44(0.43)
Ogilvie/Montreal	C(D)	0.79(0.88)	EBL(SBL)	41.7(41.9)	B(B)	0.69(0.66)
Miss Ottawa/Montreal	A(B)	0.47(0.68)	WBT(EBT)	5.4(8.4)	A(B)	0.46(0.66)
Sinclair/Montreal	A(B)	0.52(0.64)	WBT(EBT)	12.8(6.8)	A(B)	0.51(0.62)
Shefford/Montreal	E(D)	0.94(0.90)	WBT(EBT)	35.8(38.4)	D(D)	0.85(0.84)
174 WB Ramps/Montreal	F(D)	2.14(0.90)	SBR(SBR)	107.8(18.3)	F(C)	1.17(0.80)
174 EB Ramps/Montreal	C(F)	0.75(1.12)	WBT(EBT)	14.6(53.0)	C(F)	0.74(1.09)
Blair/Ogilvie	D(E)	0.90(0.94)	NBT(EBT)	50.7(43.9)	C(D)	0.73(0.88)
Blair/Gloucester Center	E(C)	0.95(0.72)	WBL(EBR)	26.5(26.1)	C(B)	0.76(0.68)
City Park E/CSIS/Ogilvie	A(D)	0.45(0.84)	WBT(EBT)	11.4(23.4)	A(C)	0.42(0.75)
City Park W/Ogilvie	A(C)	0.57(0.72)	EBL(EBT)	16.0(21.8)	A(B)	0.53(0.66)

Note: Analysis of signalized intersections assumes a PHF of 0.95 and a saturation flow rate of 1800 veh/h/lane.
Red: LOS in red indicate movements or overall intersections operating at capacity.
Orange: LOS in orange indicate movements or overall intersections approaching capacity.

Overall, the vast majority of intersections operated at an overall LOS 'D' or better, with the exception of the Aviation/Montreal, which operated at a LOS E, and the 174 Ramps/Montreal, which operated at LOS 'F'. The St. Laurent/Montreal, Blair/Gloucester Center, Aviation/Montreal, and the 174 WB Ramp/Montreal intersections had isolated movements that experienced congestion/poor LOS during the AM or PM peak hours, however the intersections still had sufficient 'overall' capacity to accommodate observed traffic volumes.

2.1.9 Multi-Modal Level of Service Analysis

The Multi-Modal Level of Service (MMLOS) is a quantitative measure used to describe the convenience and comfort experience by all roadway users over a particular roadway segment or at a particular intersection. The minimum desirable MMLOS targets are based on location and type of facilities provided. These criteria are outlined in Exhibit 22 of the City of Ottawa MMLOS Guidelines (2015). The MMLOS road segment analysis results for this assignment has been summarized in Table 2-7.

Table 2-7 MMLOS – Road Segment Analysis

	Level of Service			
Road Segment	Ped (PLOS)	Bicycle (BLOS)	Transit (TLOS)	Truck TkLOS

		PLOS	Target	BLOS	Target	TLOS	Target	TkLOS	Target
MONTREAL	St. Laurent to Aviation	D	B	C	C	D	D	C	D
	Aviation to LeBoutiller	E	C	C	C	D	D	C	D
	LeBoutiller to Foxview South Side	E	C	C	C	D	D	C	D
	LeBoutiller to Foxview North Side	E	C	C	C	D	D	C	D
	Foxview to NRC EB Ramps	E	C	C	C	D	D	C	D
	NRC EB Ramps to Elwood	E	C	F	C	D	D	A	D
	Elwood to Ogilvie	E	C	F	C	D	D	A	D
	Ogilvie to Sinclair	D	C	C	C	D	D	A	D
	Sinclair to Shefford	C	A*	A	C	D	D	A	D
	Shefford to 174 EB Ramp	C	A*	C	C	D	D	A	D
BLAIR	Ogilvie to Gloucester Centre	E	A*	F	C	D	D	A	D
OGILVIE	Blair to Bathgate	D	A*	C	C	D	D	A	D

**Pedestrian PLOS targets are more aggressive in these sections as they are within 600m of a rapid transit station.*

The MMLOS results from **Table 2-7** showed none of the road segments within the study area met pedestrian level-of-service (PLOS) targets. For PLOS targets to be met along segments outside the 600m radius of a rapid transit station, operating speeds along the roadway would have to be reduced to 50km/h or less, and improvements to the sidewalk and/or boulevard width incorporated (such as a 1.8m sidewalk with greater than 0.5 m boulevard or 2.0 m sidewalk with no boulevard).

Alternatively, the PLOS targets could also be attained at operating speeds of 60km/h if a 2.0m or greater sidewalk with a 2.0m or greater boulevard were incorporated. To achieve a PLOS 'A' for road segments within a 600m radius of rapid transit stations, operating speeds would need to be reduced to 30km/h or less and an effective sidewalk width of 5m or more would be required.

Road segments which provided a curbside bike lane, or a physically separated bike lane met the minimum bicycle level-of-service (BLOS) target. The Montreal Road segments operating below targets could be improved if a curbside bike lane with a minimum width of 1.2m was provided. Blair Road between Ogilvie and Gloucester Center has 3 lanes per direction; only a physically separated bike facility would achieve the minimum BLOS target.

Existing transit and truck levels-of-service targets were met. **Table 2-8** summarizes the MMLOS intersection analysis. Note that only signalized or roundabout intersections qualify for MMLOS analysis.

Table 2-8 MMLOS – Intersection Analysis

	Level of Service							
	Pedestrian (PLOS)		Bicycle (BLOS)		Transit (TLOS)		Truck TkLOS	
Road Segment	PLOS	Target	BLOS	Target	TLOS	Target	TkLOS	Target
St. Laurent/Montreal	D	C	F	C	F	C	D	D
Retail Access/Montreal	E	C	E	C	C	C	N/A	D
Brittany/Montreal	E	C	E	C	F	C	N/A	D
Montreal/Cummings	D	C	E	C	D	C	N/A	D
Aviation/Montreal	F	C	D	C	F	C	N/A	D
Montfort/Montreal	D	C	F	C	C	C	N/A	D
Den Haag/Montreal	F	C	F	C	C	C	N/A	D
Carsons/Codd's/Montreal	E	C	F	C	F	C	N/A	D
Bathgate/Burma/Montreal	D	C	F	C	C	C	N/A	D
Blair/Montreal	F	C	F	C	F	C	D	D
Elmwood/Montreal	F	C	F	C	B	C	N/A	D
Elmsmere/Montreal	D	C	F	C	B	C	N/A	D

Road Segment	Level of Service							
	Pedestrian (PLOS)		Bicycle (BLOS)		Transit (TLOS)		Truck TkLOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TkLOS	Target
Bethany/Montreal	F	C	F	C	B	C	N/A	D
Ogilvie/Montreal	F	C	F	C	F	C	B	D
Miss Ottawa/Montreal	E	C	D	C	N/A	C	N/A	D
Sinclair/Montreal	F	A*	D	C	N/A	C	N/A	D
Shefford/Montreal	F	A*	E	C	F	C	N/A	D
174 WB Ramps/Montreal	E	A*	B	C	E	C	A	D
174 EB Ramps/Montreal	D	A*	B	C	D	C	B	D
Blair/Ogilvie	F	A*	F	C	F	C	D	D
Blair/Gloucester Center	F	A*	E	C	F	C	B	D

N/A - not applicable to TLOS as it is not on a bus route or not applicable to TkLOS as trucks not anticipated to turn onto minor road (not part of truck route)
**Pedestrian PLOS targets are more aggressive in these intersections as they are within 600m of a rapid transit station.*

Similar to the road segment results, none of the noted intersections met PLOS targets. A major contributing factor was the number of lanes required to cross at any given intersection. The majority of intersections have at least one approach with 5 or more lanes to cross. To meet PLOS targets for an approach with 5 lanes to cross, a protected left turn cycle, a leading pedestrian cycle, a corner radius of 0m to 3m and a raised crosswalk must be incorporated. However, implementing these measures to meet PLOS targets would, in turn, affect vehicle, transit and truck levels-of-service.

The BLOS target for intersections were not met within the study area, except at the 174 Ramps/Montreal since both east and west ramps have turning prohibitions. To meet BLOS targets, a cycle-track, curbside or pocket bike lane, or a multi-use pathway (MUP) must be incorporated.

TLOS are based on average delays for movements used by transit at an intersection. To meet TLOS target 'C', average movement delay for buses must be equal to or less than 20 seconds. Intersections without transit service did not receive a TLOS. Generally, intersections of major roadways were less likely to meet the TLOS due to congestion. Driveway friction combined with high traffic volumes contribute to the low TLOS. Implementing continuous bus lanes would greatly improve the TLOS.

All TkLOS targets were met within the Study Area.

2.2 Future Conditions

2.2.1 Planned Transportation Network

The City's 2013 Transportation Master Plan (TMP) identifies Montreal Road and Blair Road as Transit Priority Corridors to accommodate future travel demand and meet modal share objectives with implementation currently anticipated beyond the TMP's 2031 horizon year.

Transit priority corridors complement the rapid transit network by providing improved city-wide transit access to major employment, commercial and institutional land uses.

The TMP identifies the following sections of the study corridor:

- Montreal Road from St. Laurent Boulevard to Blair Road; and Blair Road from Montreal Road to Blair Station, in the 2031 Affordable Rapid Transit and Transit Priority Network; and,
- Montreal Road from Blair Road to Ogilvie Road in the Network Concept.

The TMP describes this project as requiring road widening to provide continuous bus lanes along the corridor. These roadways are also identified in the TMP as cycling spine routes.

2.2.2 Projected Travel Demand

The City's travel demand model (TRANS) was used to develop future projected travel demand for auto and transit modes. The TRANS model takes inputs (population and employment data) broken down by discrete traffic zones across the City for a future horizon year (2046). This data is used to generate trips which are then assigned to the transportation network (auto and transit) for the weekday morning peak hour (for autos) or 2.5 hour peak period (for transit).

The City of Ottawa TRANS modelling group provided outputs to compare the mode share effect of the proposed designs on a City-wide basis and at the corridor level. Two north-south screenlines were created, one running parallel to the west of Blair Road and one west of Hwy 174 down to Innes east of Anderson Road, which are shown below in Figure 2-3. The stations for both screenlines are the following:

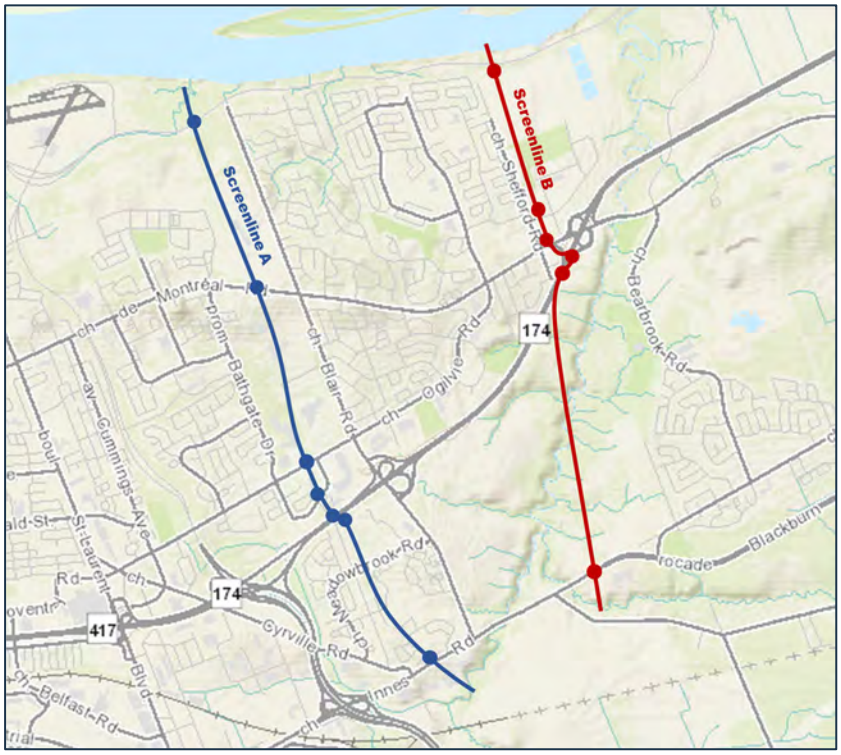
Screenline A

- Sir George-Étienne Cartier Pkwy west of Blair Road
- Montreal Road west of Blair Road
- Ogilvie Road west of Blair Road
- City Park Drive
- Transitway west of Blair Road
- HWY-174 west of Blair Road
- Innes Road west of Blair Road

Screenline B

- Sir George-Étienne Cartier Pkwy east of Blair Road
- Canotek Road
- Montreal Road west of HWY-174
- HWY-174 at Montreal Road
- Innes Road east of Blair Road
- LRT (Confederation Line) west of Montreal Road

Figure 2-3: Screenlines A and B



Multiple TRANS scenarios were completed for both screenlines based on different design combinations for each scenario including the number of general-purpose lanes, type of transit facility, average operating speed, and transit headway. A breakdown of each scenario is provided in **Table 2-9**.

Table 2-9 TRANS Screenline Scenarios

Scenario	Criteria
2011	Base
A	Do Nothing (2031 Affordable Network)
B	Reduce Transit Headway 50% Routes 12/17
E	1 General Purpose Lane + 1 Curbside Bus Lane
E3	1 General Purpose Lane + 1 Median Bus Lane (BRT)
E5	1 General Purpose Lane + 1 Median Bus Lane (BRT) + Reduce Headway 50% (Routes 12/17)
J	2 General Purpose Lanes + 1 Curbside Bus Lane
J3	2 General Purpose Lanes + 1 Median Bus Lane (BRT)
J5	2 General Purpose Lanes + 1 Median Bus Lane (BRT)+ Reduce Headway 50% (Routes 12/17)

2.2.3 Results and Discussion

All analysis tables for this assignment have been provided in the attachments. It is important to note the mode share results reflect the AM peak period (3-hr) only. The land use inputs were based on 2046 assumptions on the 2031 affordable network, without expansion of the current urban boundary. Walking trips are not considered in the TRANS model, but for reference, the city-wide walking mode share is in the order of 10%.

At the most aggregated level, i.e. the mode share breakdown for all travel within City of Ottawa limits, the results suggest the type of transit facility and number of general-purpose lanes on Montreal Road (within the EA study area) would have negligible impact on transit ridership and auto usage. There was only a 0.1% to 0.2% difference in the auto and transit mode shares respectively between all scenarios. At the screenline level, there was still very little variation found in the transit and auto mode shares, less than 3% difference between all scenarios at Screenline A, and less than 5% at

Screenline B. These results suggest the design of the Montreal Road transit priority corridor, in whatever ultimate form, would have negligible influence on travel behaviour beyond the limits of the study area. Therefore, the analysis needed to dig deeper to enable a proper comparison between the different design scenarios, meaning the mode share analysis had to focus on the mode share impacts on the Montreal Road corridor in isolation.

Screenline B results on Montreal Road showed that transit ridership (heading westbound in the AM peak period) was quite low compared to the total screenline (less than 8%), which reflects the significant draw of the future Montreal LRT Station located nearby. The eastbound results were more insightful, but not ideal since they represent the reverse commute where the volumes/ridership numbers were smaller in comparison.

Screenline A results on Montreal Road were the most promising, being far enough away from the area of influence of LRT to provide useable comparisons between proposed design options in the peak direction. Table 2-10 below summarizes the mode share results for the Montreal Road Station west of Blair Road at Screenline A.

Table 2-10 Screenline A Mode Share Station Results – Montreal Rd West of Blair Road (AM Peak Period)

	IN		OUT	
Scenario	Auto	Transit	Auto	Transit
2011	87.8%	12.2%	77.6%	22.1%
A (Do nothing: 2031 AN)	88.6%	11.4%	80.4%	19.5%
B (50% Headway)	83.1%	16.9%	73.9%	26.0%
E (1 GP + 1 BL)	80.8%	19.2%	76.2%	23.7%
E3 (1GP + 1 BRT)	76.6%	23.4%	71.6%	28.3%
E5 (1GP + 1 BRT + 50% H)	65.6%	34.4%	65.2%	34.7%
J (2GP + 1 BL)	88.2%	11.8%	80.6%	19.3%
J3 (2GP + 1 BRT)	85.2%	14.8%	77.3%	22.6%
J5 (2GP + 1 BRT + 50% H)	77.5%	22.5%	71.0%	29.0%

Note that "In" refers to vehicles heading WEST towards downtown and "Out" travelling EAST away from downtown.
AN = Affordable Network; BL = Curbside Bus Lane; BRT = Median Bus Rapid Transit; H = Headway

General insights from Table 2-10 have been summarized below:

- The auto mode share did not decrease significantly with exclusive transit lanes and 2 GP lanes (0% with curbside bus lanes, <3% with BRT) [comparing A with J and J3];
- The corresponding transit mode share for 2 GP lanes showed no increase with curbside bus lanes and increased similarly by 3% with BRT, showing a very small increase in ridership with higher order transit;
- Comparatively, reducing to 1 GP lane with either a curbside bus lane or BRT had a greater impact, reducing auto mode shares between 4%-12%, with BRT having an increased affect over curbside bus lanes by 5%-6% [comparing A with E and E3];
- The corresponding transit mode share for 1 GP lane increased by the same proportions, with BRT increasing ridership by 4%-5% over curbside bus lanes;
- The most effective means of increasing transit was shown to be reducing the headway of key bus routes (Routes 12 and 17), which alone, resulted in a 5%-7% reduction in auto mode share, and a similar increase in transit mode share [comparing A with B].
- Combining the headway reduction with higher order transit (BRT) produced the most pronounced results:
  - With 2 GP lanes, auto mode shares dropped 9%-11% with a corresponding increase in transit mode share by 10%-11%; [comparing A with J5]
  - With 1 GP lane, auto mode shares dropped by 15%-23% with a similar increase in transit mode share [comparing A with E5]
- Although the percentage increase/decrease between auto and transit mode shares were comparable overall, the number of auto trips greatly outweighed transit ridership at the Montreal Road screenline (multiple times higher).

Significant decreases in auto trips resulted in an increase in auto trips on alternative corridors such as HWY-174, Ogilvie Road, the Sir George-Étienne Parkway and Innes Road.

The key takeaways from this analysis are that the TRANS model suggests the potential investment in higher order transit (BRT) over curbside bus lanes was not shown to yield significant increases in transit mode share (only 3% - 5%) along Montreal Road. While converting to 1 general purpose lane and 1 transit lane had greater impact in lowering auto usage and increasing transit mode share along Montreal Road, the majority of motorists using the corridor appear to be diverting to parallel routes along the screenline, which may not have capacity to accommodate this traffic. The TRANS model suggests that the most effective means to increase transit ridership along the Montreal Road corridor is reducing the headway of Routes 12 and 17 (two prominent routes along the corridor) by 50%, although it should be noted that this may be a consequence of the weighting the model places on transit "wait" time versus in-vehicle travel time. Combining the reduced headway with exclusive transit lanes yielded the best results in increasing transit ridership and reducing auto usage on Montreal Road. While the TRANS model results above will be used to help inform and guide the evaluation of alternatives, it should be noted that this is but one input in the decision-making process.

3.0 EXISTING ENVIRONMENTAL CONDITIONS

3.1 Study Area

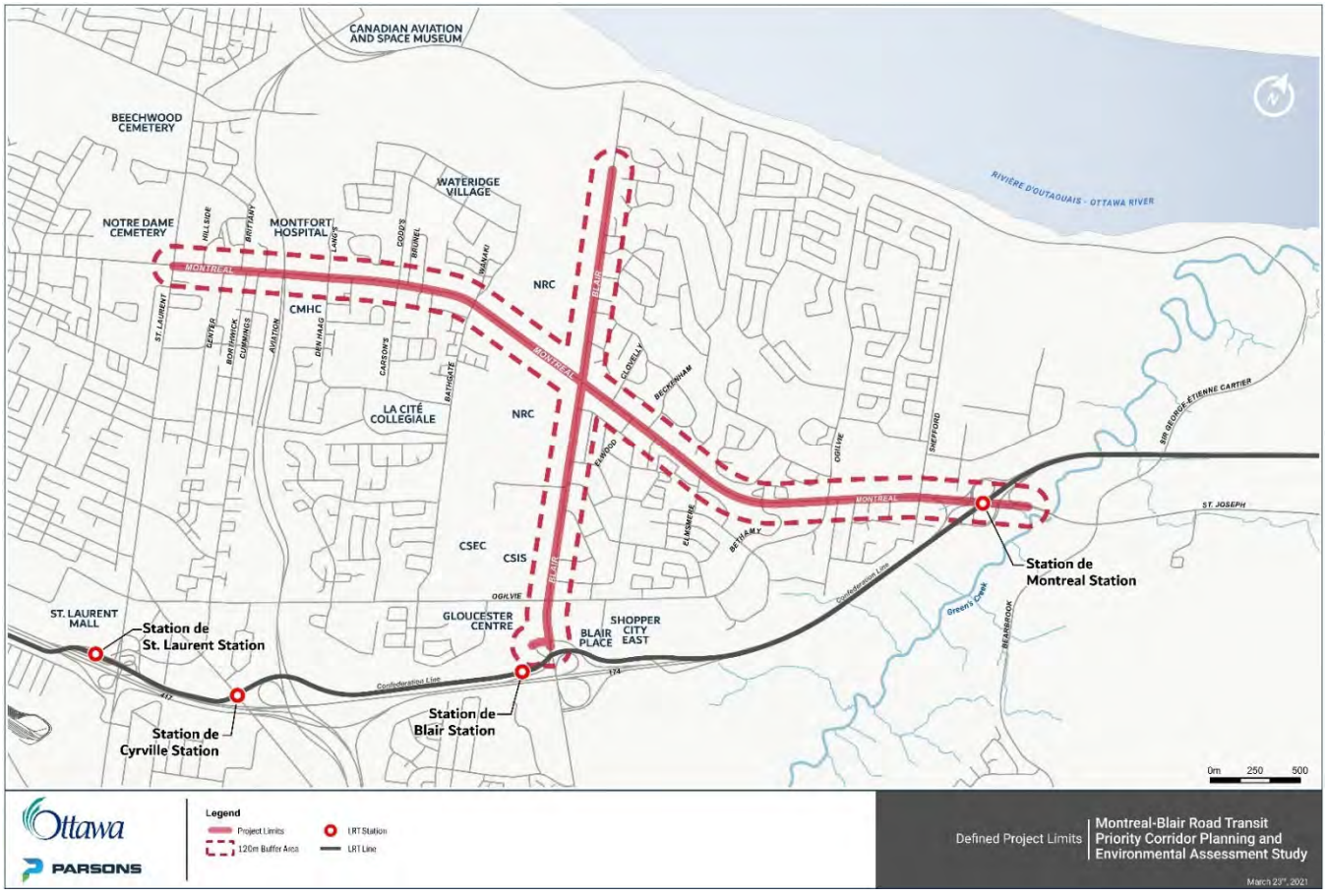
This section of the ESR presents the findings of the studies and investigations undertaken to date on the existing conditions applicable for the Project Limits. Overall, baseline data was collected and analyzed for key environmental parameters to:

- Provide an understanding of existing conditions;
- Allow for future predictions of how the proposed project may cause these environmental conditions to change;
- Allow for future predictions of how adverse effects can be mitigated and beneficial effects enhanced; and,
- Provide a basis for designing monitoring programs.

3.1.1 Physical and Temporal Boundaries

The Study Area may change depending on the element of the environment being analysed. This is because some potential environmental effects may be much more localized, such as noise, whereas others like the movement of people may have broader implications. The Study Area for each element of the environment is described based on the established Project Limits for the study. The Project Limits for the study are defined as the existing road right-of-way (ROW) along Montreal Road (St. Laurent Boulevard to the Green's Creek corridor) and along Blair Road (1.2km north of Montreal Road to Blair Station) (**Figure 3-1**).

Figure 3-1 Defined Project Limits for the EA Study



3.2 Methods of Investigation

This information was prepared by a multidisciplinary team of land use planners, biologists, geologists, archaeologists, landscape architects, municipal engineers, transportation planners, and experts in air quality, noise and vibration. This team of specialists collected, consolidated, reviewed and screened all available information with a view towards establishing the basis for development, analysis and evaluation of alternatives.

The inventory considered all available background material. The inventory is of sufficient detail to enable the analysis and evaluation of alternative transportation solutions, designs, mitigating measures and monitoring programs.

The general methodology involved the following elements:

- The submission of requests for data, drawings and reports to affected agencies;
- Contacting and meeting with affected parties as required;
- Consolidating, reviewing and analysing relevant material for each element;
- Conducting air photo interpretation and field verification as required; and
- Identifying elements or criteria that could be considered potential evaluation criteria.

Specific methods of investigation may be discussed in further detail in the respective sections as warranted. Transportation conditions and planning policies related to transportation were summarized in the Needs and Opportunities section of the Environmental Study Report (ESR) and are considered as forming part of the existing conditions for the Project Limits.

3.3 Social Environment

The existing conditions for the social environment within the Project Limits are documented through a review of relevant policy and readily available documents.

3.3.1 Regulatory Planning Policies

3.3.1.1 Federal Policy

The federal policy context providing planning guidance applicable to the Project Limits consists of the National Capital Commission (NCC) policy document: The Plan for Canada's Capital and the Greenbelt Master Plan.

3.3.1.1.1 Plan for Canada's Capital (2017)

The Plan (2017) is a long-range planning document that acts as a blueprint for the evolution of federal lands within the National Capital Region. It guides the federal management of lands to ensure that the capital reflects its national importance. The Plan acknowledges a shared and collective responsibility with municipal and provincial planning authorities to achieve the objectives of the plan.

The Plan has three strategic pillars that guide it, including:

- An Inclusive and Meaningful Capital;
- A Picturesque and Natural Capital; and
- A Thriving and Connected Capital.

The Plan aims to protect the legacy from the past while building on and strengthening the unique character of Canada's Capital Region looking towards Canada's bicentennial in 2067. The Plan focuses on sustainable mobility as fundamental to the Capital experience, providing opportunities to enjoy and explore the diversity of natural and built environments in the National Capital Region.

3.3.1.1.2 Greenbelt Master Plan (2013)

The Greenbelt Master Plan (GMP) directs and guides the preservation and evolution of the National Capital Greenbelt to 2067. One of the goals of the GMP with respect to sustainable transportation infrastructure involves ensuring that "environmental best management practices are applied in the design, operation and maintenance of existing infrastructure". The GMP highlights that new infrastructure in the Greenbelt should not be permitted "unless there is a

demonstration that there are no alternatives outside of the Greenbelt and no net loss to ecological or overall Greenbelt integrity".

The GMP includes Sector Plans which provide more detailed information on the land use designations, capital experiences, and recreational networks specific to the sector. The eastern edge of the Study Area is included in the Green's Creek Sector of the GMP (**.**

Figure 3-2). The area provides "an important natural separator between the communities of Beacon Hill, Orleans, and Blackburn Hamlet". Further, the area's diversity and accessibility from the Capital core and its proximity to nearby communities, creates opportunities for a broad range of visitor and recreational experiences as well as opportunities for farm buildings just east of the Sir George Etienne Cartier Parkway.

The eastern edge of the Study Area includes directions within three land use designations including: Core Natural Areas, Natural Link and Agriculture (**.**

Figure 3-2). The primary objectives of these land use designations are as outlined in **Table 3-1.**

Figure 3-2: Green's Creek Sector Plan (Greenbelt Master Plan, 2013)

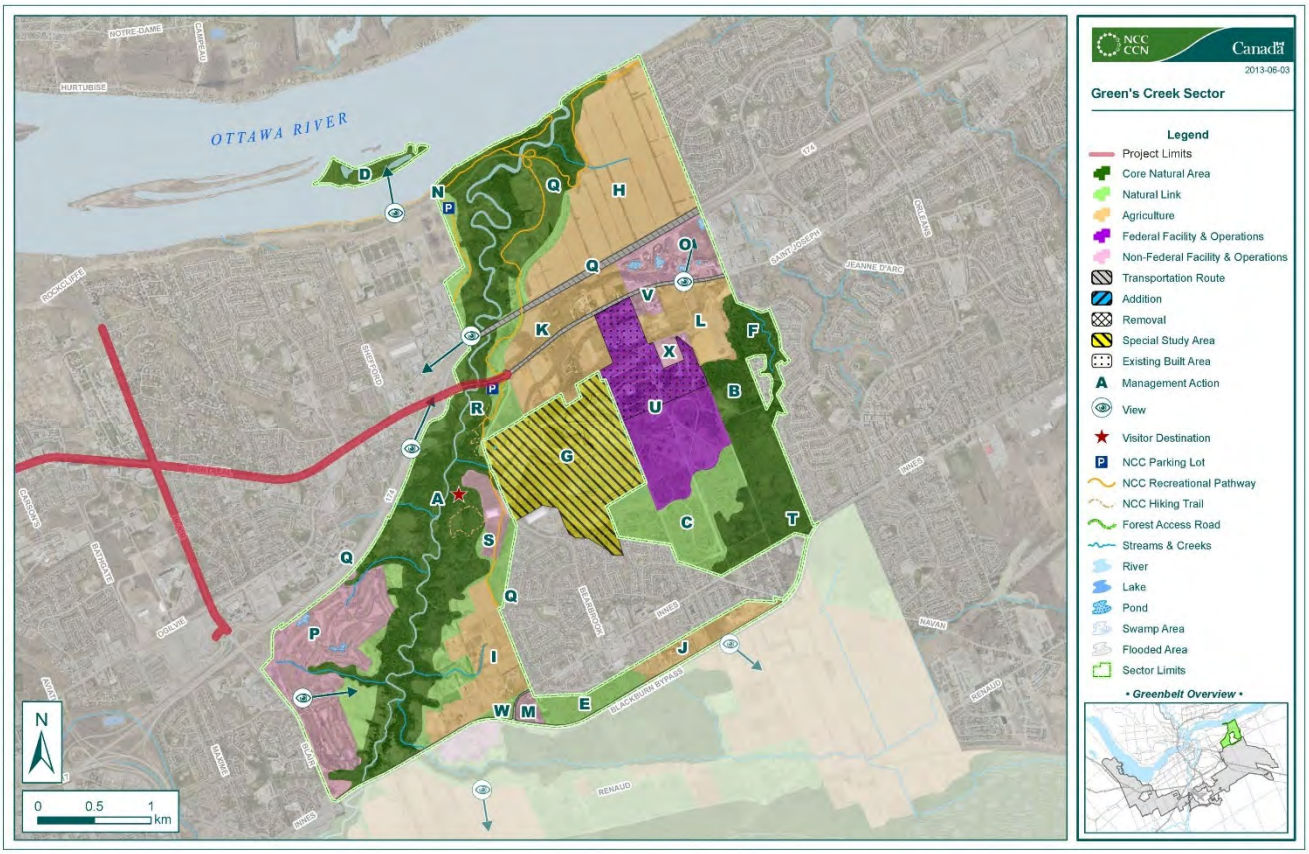


Table 3-1 Greenbelt Master Plan Land Use Designations, Primary Objectives

Land Use Designation	Primary Objectives
AGRICULTURE	• Practice sustainable agriculture • Support productive Greenbelt farms that contribute to local and regional food supply • Diversify Greenbelt farming and provide opportunities for agri-tourism • Reduce the area covered by large mono-culture farming operations and promote diverse agriculture lands • Enhance Canada's Capital through conservation of natural visual landscapes
CORE NATURAL AREA	• Protect biodiversity and ecosystem health for the long term • Restore and enhance terrestrial and aquatic biodiversity • Enhance Canada's Capital through the conservation of natural visual landscapes
NATURAL LINK	• Complement the Natural Environment, Agriculture, and Capital Experiences & Recreation • Ensure Agriculture Canada Research Facility located within the Study Area contributes to the Greenbelt's visual landscape

3.3.1.2 Provincial Policy

The Provincial Policy Statement (PPS) (MMAH, 2020) is issued under Section 3 of the *Planning Act*. The Provincial Policy Statement provides policy direction on matters of provincial interest related to land use planning and development. As a key part of Ontario's policy-led planning system, the PPS sets the policy foundation for regulating the development and use of land. It also supports the provincial goal to enhance the quality of life for all Ontarians by building strong, healthy, and resilient communities with long-term economic prosperity. It includes policies on key issues that affect our communities, such as:

- the efficient use and management of land and infrastructure;
- protection of public health and safety;
- protection of the environment and wise use and management of resources; and,
- ensuring appropriate opportunities for employment and residential development, including support for a mix of these uses.

Municipalities use the PPS to develop their Official Plans and to guide and inform decisions on planning matters. All decisions affecting land use planning matters "shall be consistent with" the PPS (MMAH, 2020).

The PPS defines *Development* as "*the creation of a new lot, a change in land use, or the construction of buildings and structures requiring approval under the Planning Act*." Many land use policies outlined in the PPS restrict development in and/or near elements of provincial interest (e.g. provincially significant wetlands) unless it can be demonstrated that there will be no negative impact on the environmental features or their ecological functions. However, as per the PPS, "*activities that create or maintain infrastructure authorized under an environmental assessment process*" are not considered development.

Notwithstanding, environmental assessments have regard to matters of provincial interest and where impacts cannot be avoided shall be minimized to the extent possible through appropriate mitigation, monitoring and/or compensation.

3.3.1.3 Municipal Policy

The municipal policy context affecting the Project Limits consists of the City of Ottawa Official Plan; City of Ottawa New Official Plan (Draft 2021); Secondary Plans; Community Design Plans (CDP) and the Comprehensive Zoning By-Law.

3.3.1.3.1 City of Ottawa Official Plan (2013, as amended)

The Official Plan provides a vision of the future growth of the City and a policy framework to guide its physical development to the year 2031. The City has been working on the New Official Plan since early 2019. On October 26, 2021 the City Council approved the New Official Plan. The policy will now go to the Ministry of Municipal Affairs and Housing for adoption and implementation. It is a legal document that addresses matters of provincial interest defined by the PPS. The Official Plan serves as a basis for, and provides guidance on, a wide range of municipal activities.

Table 3-2 outlines the various land use and other designations that apply for the Project Limits. Figure 3-3 illustrates the land use designations of the 2013 Official Plan.

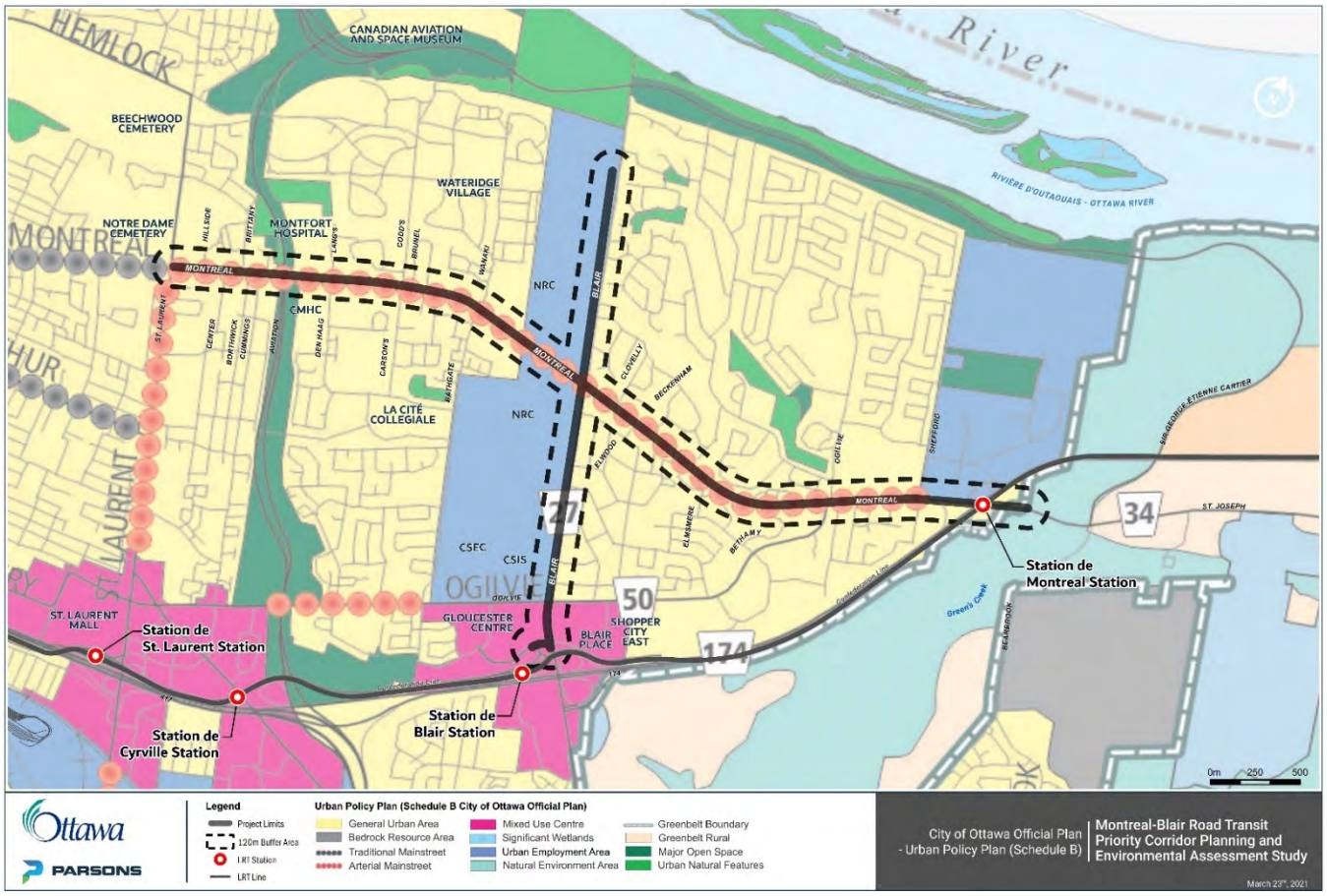
The Official Plan acknowledges, supports and protects corridors for the development of a rapid transit network. The plan also illustrates the light rail system's integration within the rapid transit system linking the City of Ottawa's Central Area to the Town Centres outside the Greenbelt and to the Mixed Use Centres inside the Greenbelt providing enhanced opportunities for better connections in the City. The Official Plan designates Montreal Road east of St. Laurent Boulevard as an Arterial Mainstreet and as a Transit Priority Corridor (Continuous Lanes) and Blair Road south of Montreal Road to Ogilvie Road as Transit Priority Corridor (Isolated Measures). Arterial mainstreets are recognized to support transit facilities, "*...to enhance connections that link development sites to public transit, roads and pedestrian walkways*" (City of Ottawa, 2013). The Blair LRT Station and the future Montreal LRT Station will add increased pedestrian and cyclist flow along Montreal Road and Blair Road.

Table 3-2 Land Use Designations Applicable in the Study Area

Schedule	Designation	Location within Project Limits
B - URBAN POLICY PLAN	General Urban Area	Lands north and south of Montreal Road as well as lands east of Blair Road.
	Arterial Mainstreet	Montreal Road, east of St. Laurent Boulevard to Shefford Road
	Traditional Mainstreet	Montreal Road, west of St. Laurent Boulevard
	Major Open Space	Portions of land north and south of Montreal Road at the intersection with Aviation Parkway.
	Urban Natural Features	Montfort Hospital Woods (east and west sides of the Aviation Parkway north to Via Venus Private and extending almost south to Montreal Road)
	Urban Employment Area	Lands west of Blair Road, extending north and south of Montreal Road at the intersection of Montreal Road and Blair Road. Lands north of the interchange between Montreal Road and OR 174.
	Natural Environment Area	Lands east and south of the interchange between Montreal Road/St Joseph Boulevard and OR 174.
C – PRIMARY URBAN CYCLING NETWORK	On-road Cycling Routes	Montreal Road, St Joseph Blvd and Blair Road
	Off-road Cycling Routes	Aviation Parkway
D – RAPID TRANSIT AND TRANSIT PRIORITY	Transit Priority Corridor (Continuous lanes)	Montreal Road Codd's Road Blair Road
	Transit Priority Corridor (Isolated measures)	St. Laurent Boulevard Ogilvie Road
	Transit Station – Rail	Blair Light Rail Transit Station Blair Station Park-and-Ride
E – URBAN ROAD NETWORK	Arterial Roads	Montreal Road Blair Road south of Montreal Road St Joseph Blvd Ogilvie Road St. Laurent Boulevard
	Major Collector Roads	Blair Road north of Montreal Road
	Collector Roads	Cummings Avenue Den Haag Drive Carsons Road

Schedule	Designation	Location within Project Limits
		Bathgate Drive Shefford Road
	City Freeway	OR 174
	Federally Owned Road	Aviation Parkway
I – SCENIC ROUTES	Scenic Entry Routes	Aviation Parkway intersecting at Montreal Road OR174
K – ENVIRONMENTAL CONSTRAINTS	Landform Feature	A portion of the northeast section of Montreal Road and Blair Road intersection
	Unstable slopes	Green's Creek Corridor Approximately following along Rothwell Drive and Naskapi Drive, then just north of Montreal Road to Shefford Road.

Figure 3-3 City of Ottawa Official Plan (2013, as amended)



3.3.1.3.2 City of Ottawa New Official Plan (Draft)

The New Official Plan will guide growth and manage physical change to 2046 through goals, objectives, and policies for the City of Ottawa (2021). The New Official Plan is organized around *The 5 Big Moves* (2019) which are policy initiatives in the following areas:

- growth management;
- mobility;
- urban and community design;

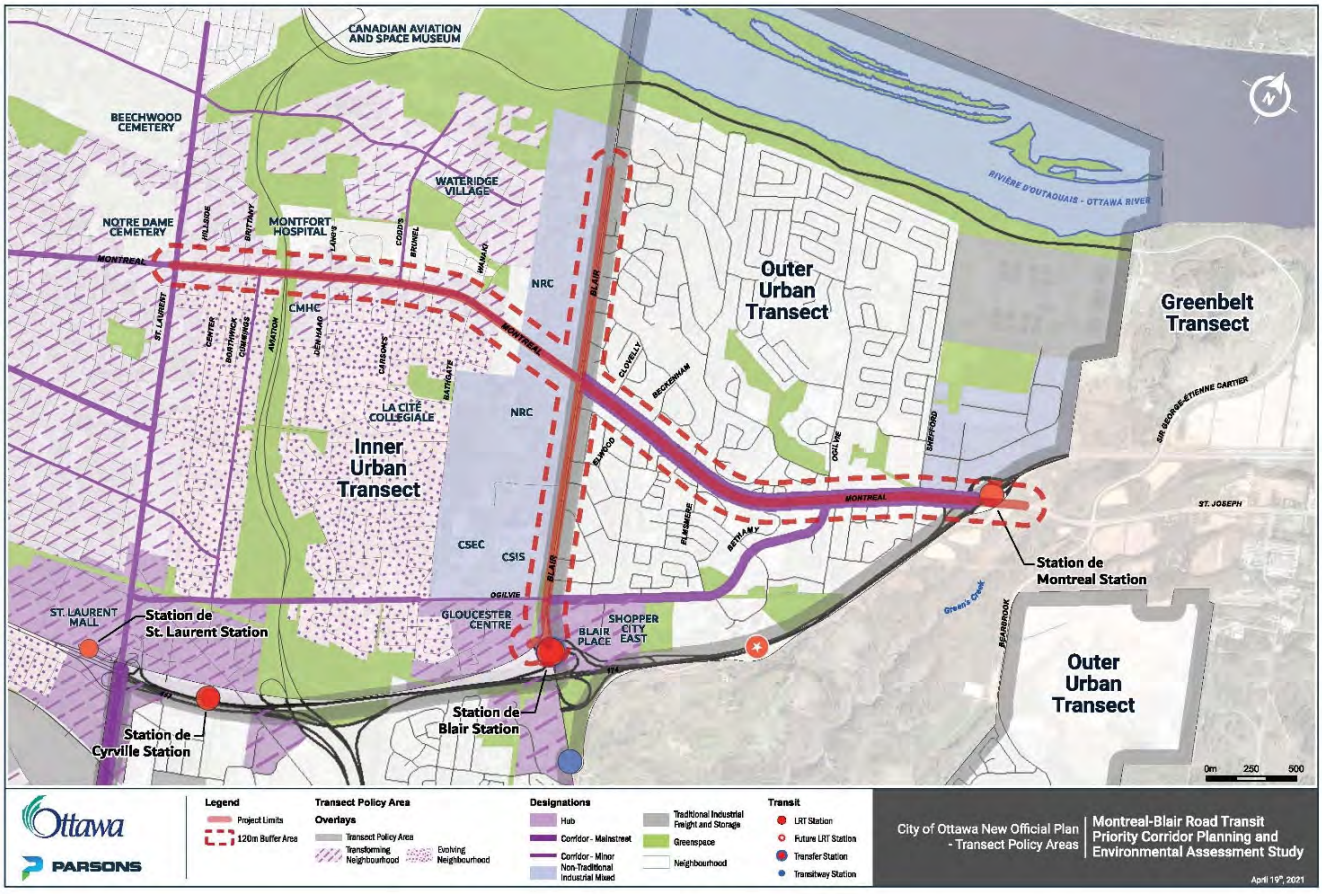
- climate, energy, and public health; and
- economic development.

By 2046, the City aims to accommodate the majority of growth through regeneration rather than greenfield development, and aims to support the majority of trips via sustainable transportation. To achieve economic development policy goals, the Official Plan directs major employment to hubs and corridors, particularly employment that is compatible with residential use.

The New Official Plan uses a growth management framework based on transect policy areas: Downtown Core, Inner Urban, Outer Urban, Greenbelt, Suburban, And Rural. Transects are defined based on location, maturity of development, and degree of functionality as a 15-minute neighbourhood. The transect framework means that the Project Limits span three transects as shown in **Figure 3-4**:

- east of the 417 interchange is Greenbelt transect;
- St. Laurent Boulevard to Blair Road is Inner Urban Transect (Schedule B2, New Official Plan); and
- Blair Road to Highway 417 interchange is Outer Urban Transect (Schedule B3, New Official Plan).

Figure 3-4 City of Ottawa New Official Plan – Transect Policy Areas



Land use planning goals for the Inner Urban Transect is to provide direction to the hubs, neighbourhoods, and mainstreet corridors, as well as to enhance urban pattern, site design, built form, and sustainable transportation (active and transit).

Goals for Outer Urban Transect are similar, with a more suburban development pattern and a focus on street connectivity as well as mobility.

Montreal Road from the Rideau River to Green's Creek – through both the Inner and Outer Urban Transects – is designated as a Corridor – Mainstreet (B2 and B3). In this Outer Urban Transect area, Montreal Road is the only designated Mainstreet Corridor (B3). West of the Inner Urban Transect boundary (B2) at the Rideau River is the Downtown

Core Transect Policy Area, where Montreal Road becomes Rideau Street and is also designated Mainstreet Corridor through Downtown (Schedule B1, not pictured).

The adjacent land north and south of the corridor within the Project Limits is designated as follows:

- Transforming Neighbourhood from St. Laurent to Bathgate Drive. At this section, land further south of the corridor, not directly adjacent to the ROW, is designated Evolving Neighbourhood (Inner Urban Transect).
- Non-Traditional Industrial Mixed from Bathgate Drive to Blair Road around the National Research Council (NCR) Canada campus area (Inner Urban Transect).
- Non-Traditional Industrial Mixed area north of the corridor near the Highway 417 interchange at the Blair Road to Green's Creek section (Outer Urban Transect).
- There are no Hubs currently designated within the project limits in either Transect Policy Area.

As such, land use and urban design direction for Mainstreet Corridors, Transforming Neighbourhoods, Evolving Neighbourhoods, and Non-Traditional Industrial Mixed designations is as follows:

- Mainstreet and Minor are Corridor sub-designations. The Corridor designation generally means "*a higher density of development, a greater degree of mixed land use, and a higher level of street transit service*" (City of Ottawa, 2020). Mainstreet Corridors are targeted for active, continuous frontage along a Mainstreet through commercial, service, and cultural development uses at grade.
- Mainstreet Corridors are also Tier 3 Design Priority Areas in Inner Urban Transect (St. Laurent to Blair Road), and Tier 4 Design Priority Areas in Outer Urban Transect (Blair Road to Highway 417 interchange). There are four tiers total of Design Priority Areas with Tier 1 the most significant. Tier 3 and 4 Design Priority Areas are characterized by neighbourhood commercial streets, a high quality pedestrian environment and public realm, and regeneration and density where rapid transit exists. Mainstreet Corridors in Inner Urban and Outer Urban Transects have a minimum of two storeys and maximum of nine storeys.
- Transforming and Evolving Neighbourhood Overlays are intended to "*provide built form direction for the urban area where regeneration is anticipated to occur*" (City of Ottawa, 2020). Both overlays indicate City support for Zoning By-law amendments that facilitate a transition from a low-density single-unit typology towards a multi-unit built form and generally towards the model of a 15-minute neighbourhood.
- Non-Traditional Industrial Mixed areas are characterized by a broad mix of commercial and light industrial uses that are generally less impactful than other designations (e.g. Traditional Industrial). These areas are intended as a transition between neighbourhoods and industrial areas and can preserve land for City economic development goals.

The New Official Plan also designates Montreal Road throughout the entirety of the project limits as a Transit Priority Corridor (Schedule C2, New Official Plan). The intensity of transit priority is to be designated in the Transportation Master Plan.

3.3.1.3.3 City of Ottawa Secondary Plans

The City of Ottawa Official Plan is supported by a collection of Secondary Plans and Site-Specific Policies. The plans contain complementary and more detailed policy direction for specific areas and neighbourhoods in the City.

The two (2) secondary plans which provide policy direction applicable to, or in proximity of the Project Limits are:

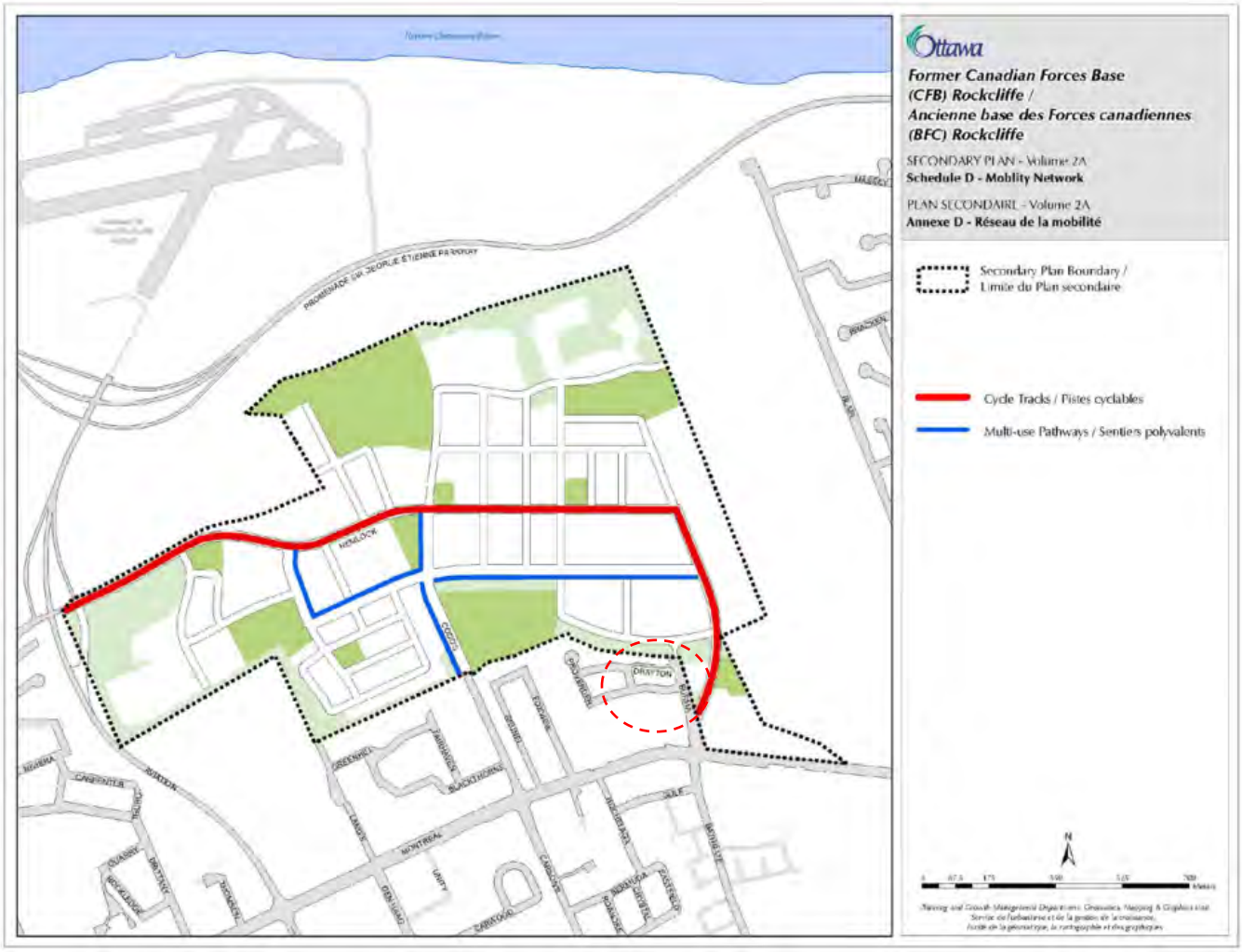
- Former Canadian Forces Base (CFB) Rockcliffe Secondary Plan
- Montreal Road District Secondary Plan

Former Canadian Forces Base (CFB) Rockcliffe Secondary Plan

The Former Canadian Forces Base (CFB) Rockcliffe Secondary Plan as seen in **Figure 3-5** is intended to guide future growth and development on the Former CFB Rockcliffe lands by providing policy direction on land use, densities, building heights, open space and mobility. The plan highlights the mobility network to be organized around a regular grid of blocks facilitating pedestrian and cyclist connectivity within the area and surrounding road network and neighbourhoods. The Secondary Plan illustrates on-road cycling facilities on Hemlock Road and Wanaki Road/Burma Road. Overall, the Plan aims to provide better cycling and walking connections with guidance from the Former CFB Rockcliffe Community Design

Plan. **Figure 3-5** illustrates a proposed cycling connection linking the Former CFB Rockcliffe site to Montreal Road (approximate location identified by a red dashed circle on **Figure 3-5**).

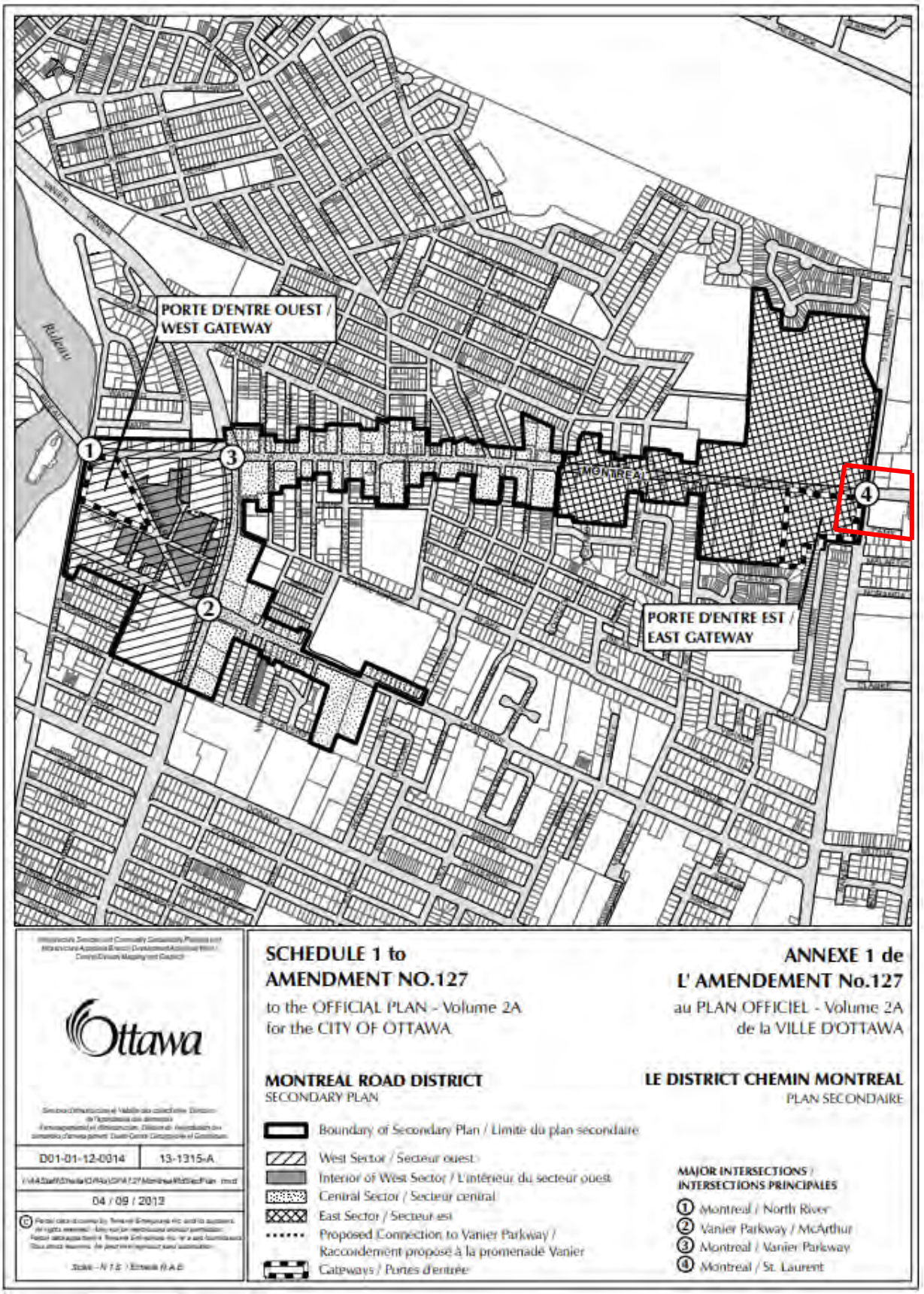
Figure 3-5 Former Canadian Forces Base (CFB) Rockcliffe Secondary Plan



Montreal Road District Secondary Plan

The Project Limits border the east gateway of the Montreal Road District as seen in **Figure 3-6**. The Montreal Road District Plan sets goals and objectives that provide a framework to guide the development of the Montreal Road District. The Secondary Plan highlights four (4) major intersections in the District and provides supporting policy guidance for their development. The primary goal for the major intersections is to improve pedestrian and cycling movement by providing enhanced crossings, improving connections to bus stops and design techniques to reduce pedestrian crossing distances. The southwest portion of the St. Laurent Boulevard-Montreal Road intersection is identified as the East Gateway and serves as a linkage between the residential areas west of St. Laurent Boulevard and commercial areas east of St. Laurent Boulevard.

Figure 3-6 Montreal Road District Secondary Plan



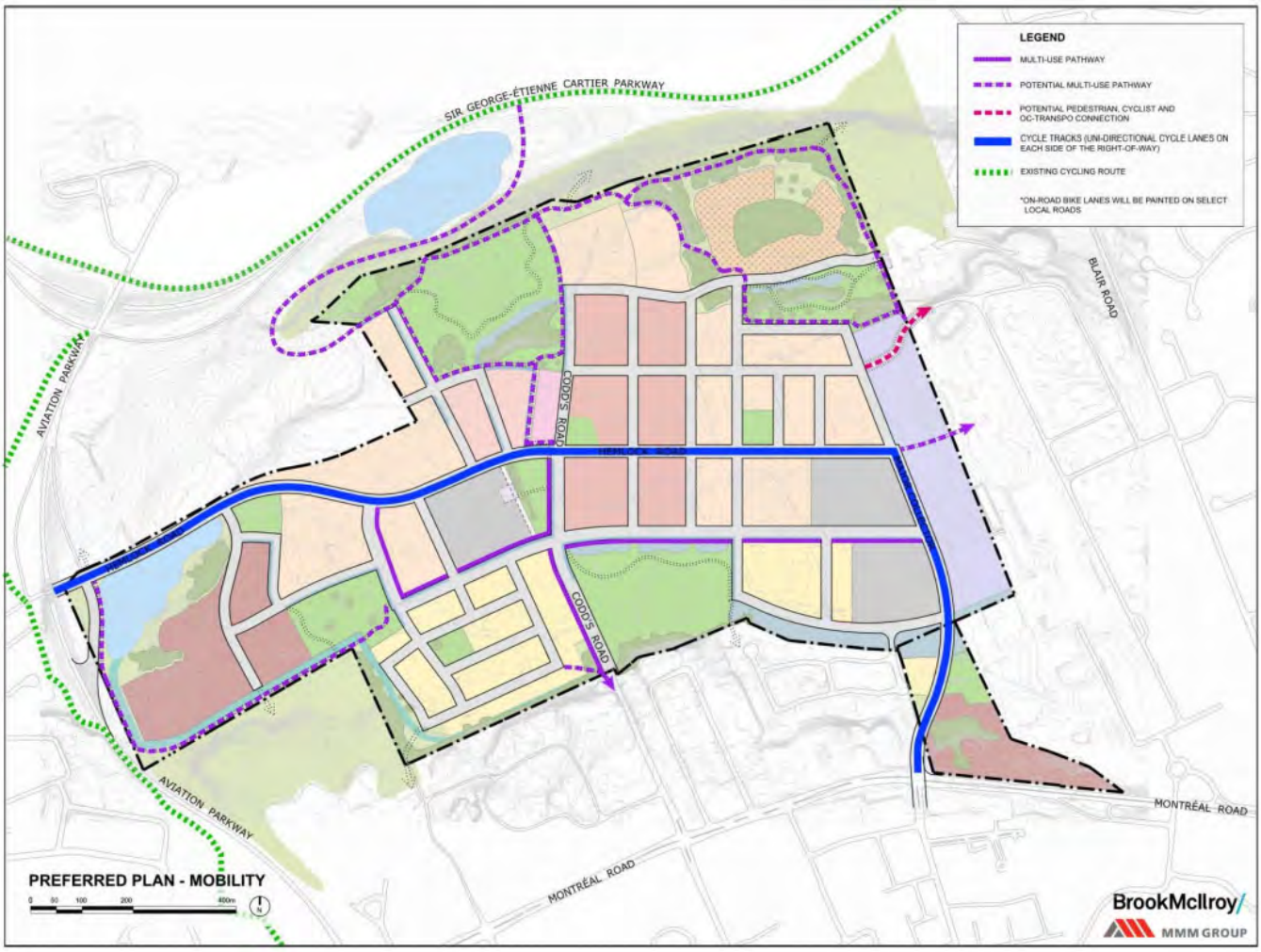
3.3.1.3.4 Community Design Plan

Community Design Plans (CDPs) are intended to guide development in target growth areas with the purpose of translating policies of the Official Plan to the community scale. CDPs recognize unique opportunities and challenges for managing development within a community and focus on encouraging intensification while also maintaining a compatible balance. CDP's form the basis for Secondary Plans policies that form part of the Official Plan and Zoning By-law.

Former CFB Rockcliffe Community Design Plan (2015)

The Former Canadian Forces Base (CFB) Rockcliffe CDP as seen in **Figure 3-7** was received by the City of Ottawa as a roadmap for future development on the site, named Wateridge Village. Redevelopment within the community is aimed at resulting in a contemporary mixed-use, walkable, cycling-supportive and transit-oriented community. The CDP aims to increase pedestrian and cycling connectivity and facilitate easy mobility from the Wateridge Village community. **Figure 3-7** illustrates the proposed pedestrian, cycling and transit connections which provide a convenient link connecting the Former CFB Rockcliffe site to Montreal Road and to Blair Road through the National Research Council (NRC) Canada Campus. The designation of Hemlock Road as a transit priority corridor through Wateridge Village was removed as part of this plan.

Figure 3-7 Former CFB Rockcliffe Community Design Plan



3.3.1.3.5 Transit Oriented Development Plan

In anticipation of the land development pressure in proximity to Ottawa's Light Rail Transit (LRT) stations, Transit-Oriented Development (TOD) plans were developed to establish a broad growth strategy for achieving transit supportive

communities and setting the stage for future transit-supportive land development in priority areas located near LRT stations.

Blair Transit Oriented Development (TOD) Plan Area

The Blair LRT station is located near OR 174 and Blair Road, adjacent to the Gloucester Centre (**Figure 3-8**). Blair Station is the interim eastern terminus of the LRT Confederation Line and a major transfer point between light rail trains and buses, until the LRT is extended to Orleans as part of the City's Stage 2 extension. A portion of the Project Limit falls within the Blair TOD Plan Area. The plan also describes the pedestrian, cycling, and street network, the Blair Green Plan and land-use framework for the area as follows:

Blair Pedestrian Network: Proposed pedestrian network highlights the addition of sidewalks and multi-use pathways to complete connections, shorten pedestrian routes and improve safety throughout the Blair TOD Plan Area.

Blair Bicycle Network: Provides opportunities to complete a disconnected assortment of cycling facilities in order to provide safe and convenient cycling access to Blair Station and throughout the Blair TOD Plan Area.

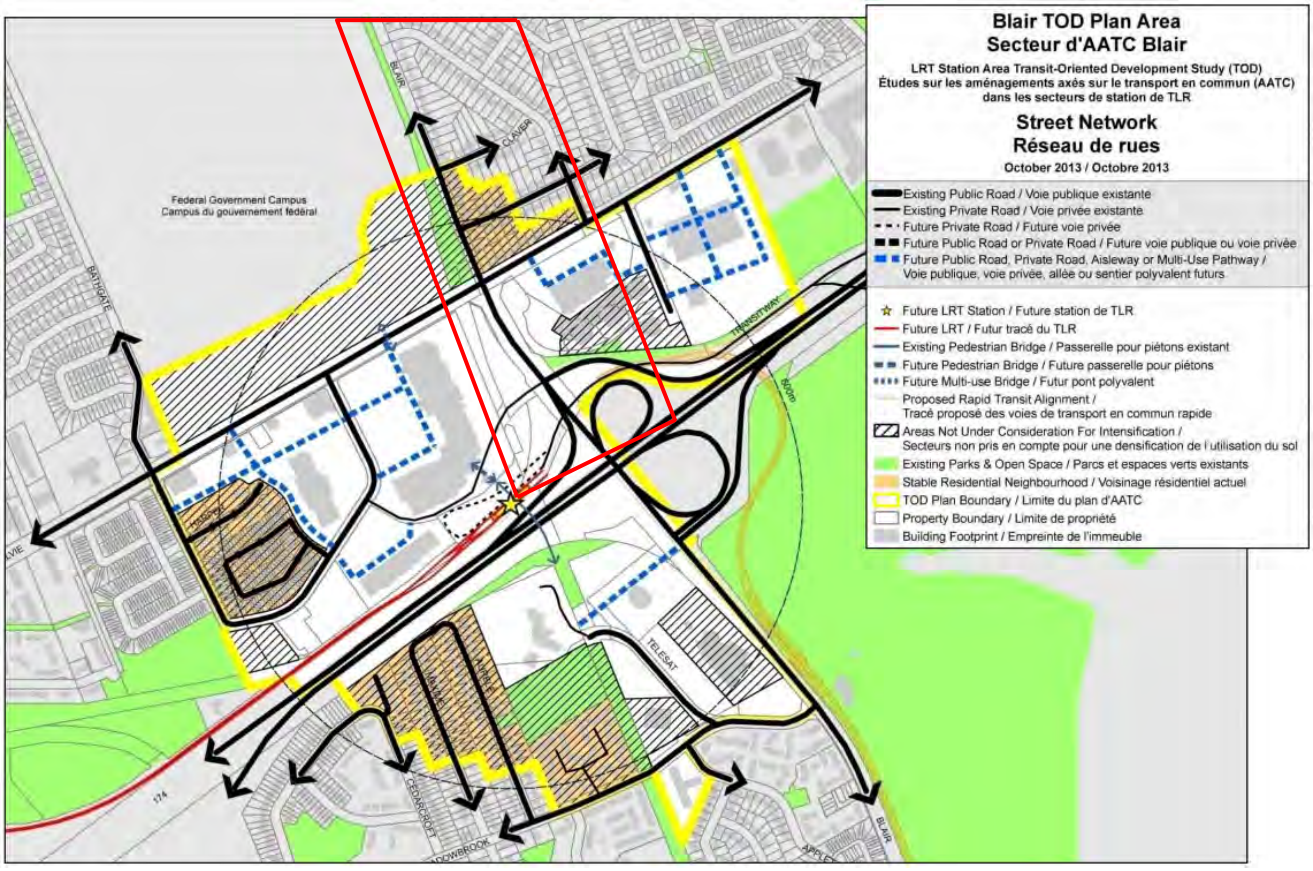
Blair Street Network: Provides new and improved connections that will strengthen pedestrian and cycling access to Blair Station.

Blair Green Plan: Builds a strong existing foundation of parks and open spaces that are found in, or adjacent to, each of the three sectors of the Blair TOD study area.

Blair Land Use Framework: The framework illustrates the land uses which is mostly designated as mixed-use which provides for a wide range of uses.

The overall Blair TOD Plan Area acknowledges that the growing federal office campus north of Ogilvie Road and west of Blair Road will influence transit ridership at Blair Station and will significantly increase north-south pedestrian movement through the Project Limits.

Figure 3-8 Blair TOD Plan Area

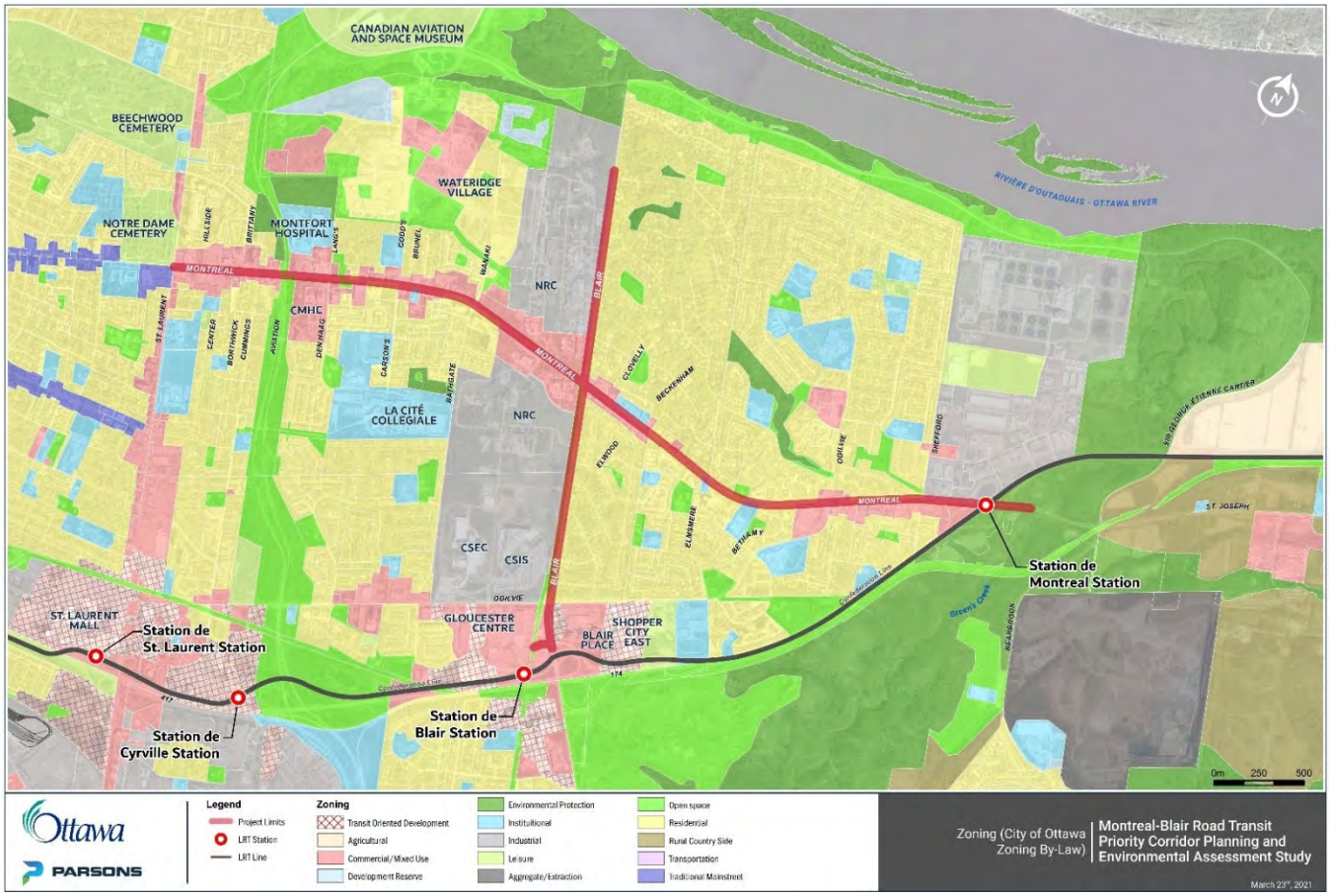


3.3.1.3.6 Zoning By-Law

The City of Ottawa Zoning By-Law implements the land use objectives of the Official Plan at a site-specific level. Given the detailed nature of zoning provisions, a characterization of zoning is provided rather than a detailed inventory of applicable zones and related standards. Zoning for the Project Limits is shown in **Figure 3-9**.

The lands adjacent to the Project Limits are contained within a range of zones including Light Industrial (IL), Residential (R1, R3, R4, R5), Parks and Open Space (O1), Mixed-Use Centre Zone (MC), TOD Zone (TD), Arterial Mainstreet (AM), Minor Institutional Zone (I1), Traditional Mainstreet Zone (TM), Environmental Protection Zone (EP), and Community Leisure Facility Zone (L1).

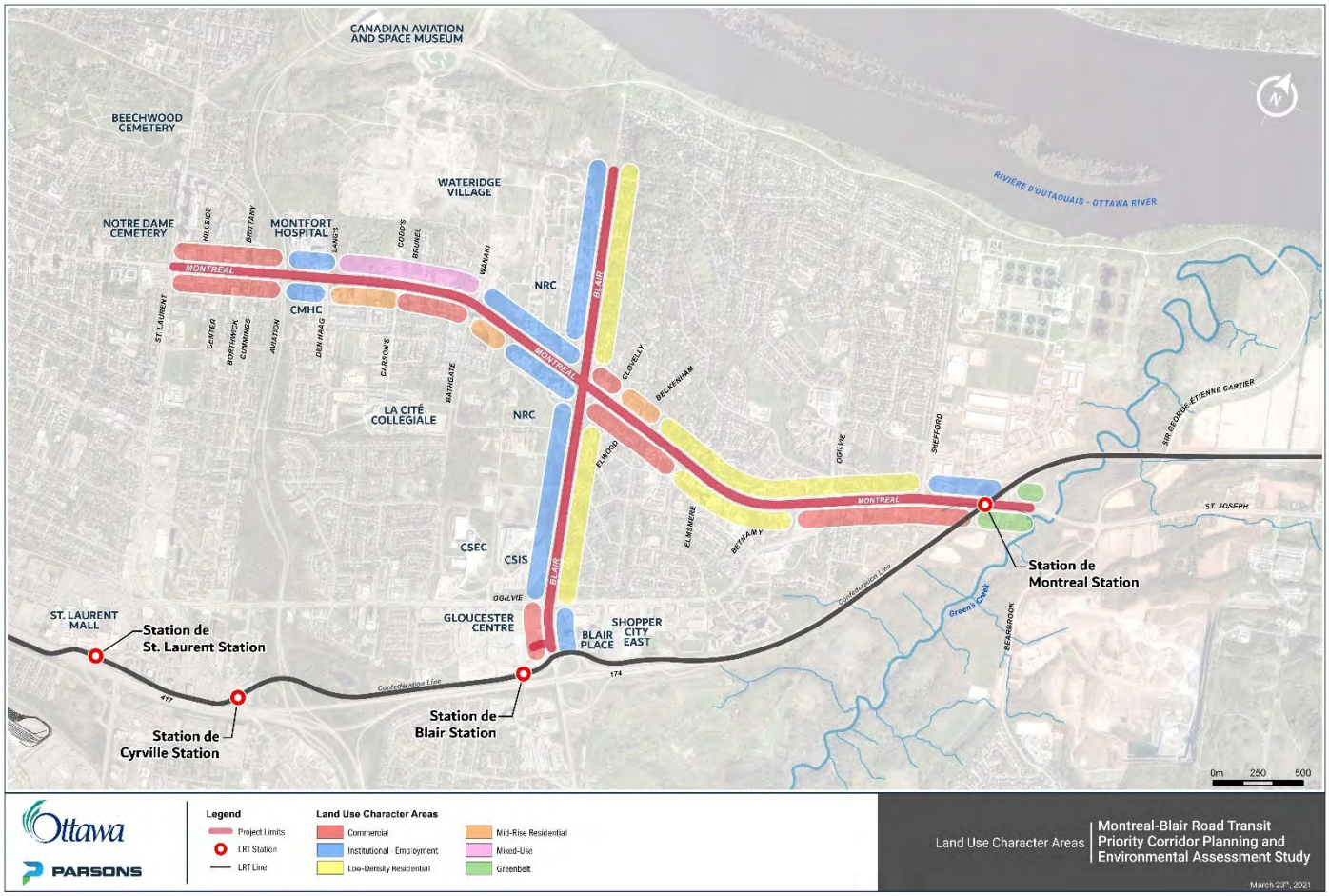
Figure 3-9 Zoning for the Project Limits



3.3.2 Land Use Character

Land use character varies throughout the Project Limits. Montreal Road is a combination of residential, commercial, institutional-employment, Greenbelt and mixed uses whereas Blair Road north of Ogilvie Road is institutional-employment on the west side and residential on the east side. South of Ogilvie Road, Blair Road contains institutional-employment and commercial lands. **Figure 3-10** illustrates the existing land use character areas for the Project Limits.

Figure 3-10 Land Use Character Areas for the Project Limits



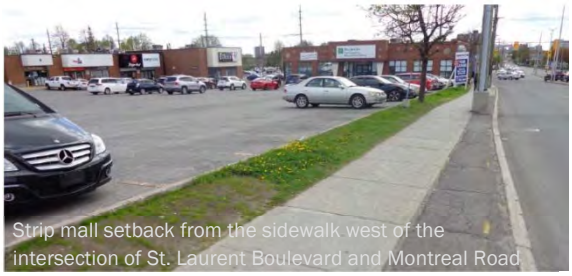
3.3.3 Landscape and Urban Design Character

3.3.3.1 Montreal Road limits

St. Laurent Boulevard to Aviation Parkway

Commercial buildings and uses located between the St. Laurent Boulevard and Aviation Parkway are setback (approximately 10+ metres) considerably from Montreal Road in order to accommodate for large parking lots between the road and the building. There are few trees or at times no trees within the City owned ROW or sidewalk space. Approximately 1.8 m wide concrete sidewalks are located along both sides of Montreal Road with standard utilities (such as hydro lines, water hydrants, light poles, street signage), overhanging directional signs, transit stops, and shelters located within the boulevard space. This section lacks street furniture and any other forms of enhancements to the public realm. The road itself includes 4 travel lanes, designated on-road bike lanes and a central two-way left turning lane with periodic concrete road medians located at intersections.


Montreal Road to Aviation Parkway Streetscape


Strip mall setback from the sidewalk west of the intersection of St. Laurent Boulevard and Montreal Road

Aviation Parkway to Bathgate Drive

This section of the road continues to maintain 4 travel lanes, designated on-road bike lanes and sections of a central two-way left turning lane with periodic concrete road medians located at intersections. Presence of trees and grass boulevards increases west of the intersection of Montreal Road and Aviation Parkway as the built environment changes from commercial uses to mixed-use residential and institutional-employment uses. The most notable institutions located to the east of Aviation Parkway are the Montfort Hospital and Canada Mortgage and Housing Corporation (CMHC) properties. Although the sidewalks on both sides of the Montreal Road continue to maintain a width of 1.8 m, a higher density of mature trees are found along the CMHC property providing a green pocket along the busy arterial mainstreet. There is presence of grass boulevards and some trees at the access / entrance to Montfort Hospital which also includes directional signage for the hospital along the City's ROW. The Aviation Parkway owned and managed by the NCC includes a parallel multi-use pathway on the west side and green road edge. The Aviation Parkway Capital Pathway is part of the NCC's Capital Pathway Strategic Plan.


Vegetation buffers with mature trees at the CMHC property on Montreal Road looking west


Montfort Hospital on Montreal Road


Grass boulevards on both sides of the sidewalk on Montreal Road looking east


Four lane road with designated bike lanes on Montreal Road looking east

Residential uses are found to the east of the Montfort Hospital and CMHC property. Tree coverage improves on both sides of Montreal Road as the uses begin to change to residential. The Le Boutillier Park lies to the east of the intersection of Montreal Road and Den Haag Drive. A cluster of dense, mature trees acts as a buffer between the residential community located to the east of Montreal Road. Concrete sidewalks are found on both sides of Montreal Road which includes hydro poles signage boards and bus stops, bus shelters, waste receptacles and benches. The road continues to maintain four travel lanes, a designated bike lane on both sides and a central turning lane with periodic concrete and vegetated road medians located at intersections. Grass boulevards with a mix of young trees along with some levels of soft landscaping are located along the frontage of residential uses such as the Cite Parkway Retirement Residence and

Hermitage Apartments. The majority of the buildings are setback 9m+ from Montreal Road and are predominantly separated by vegetated landscapes composed of turf areas, shrub planting beds and mature trees.

Bathgate Drive to Blair Road

This section of the road continues to maintain 4 travel lanes with periodic concrete road medians located at intersections. The designated bike lanes end just past Burma/Bathgate and cyclists must ride in mixed traffic. The sidewalk elements change on the north side to include a narrow grass boulevard separated by an asphalt sidewalk along the curb. The building setbacks become further away from the road with intermittent fencing and steel guardrails along a residential apartment property located on the south side of Montreal Road at the Burma/Bathgate/Montreal Road intersection.

The National Research Council (NRC) campus is located to the north and south of Montreal Road at Blair Road and is connected to Montreal Road via vehicle ramps on both sides of Montreal Road. Macallum Street is an underpass of Montreal Road which contributes towards maintaining a continuous road network within the NRC campus across Montreal Road. There are no street trees and minimal vegetation is found along the sidewalk boulevard within the City owned ROW. Light poles, transit stops, and bus shelters are the only elements found along the sidewalks with no other street furniture. Vegetation, including trees are located on private property improving the character of the street in this location.

Absence of street trees along the NRC campus sidewalk on either side of Montreal Road.

Chain link fencing (left) along NRC campus with an absence of street trees in the city owned right-of-way.

Blair Road to Ogilvie Road

The section of Montreal Road between Blair Road and Ogilvie Road predominantly consists of low to mid-rise residential uses on both sides of the road. However, there is presence of some commercial uses immediately west of the intersection of Montreal Road and Blair Road. The sidewalk continues as a 1.8 m wide concrete sidewalk with grass boulevards on both sides of the road. Buildings are set back by approximately 10 metres thereby accommodating parking lots on both sides of the road. There are few street trees and minimal vegetation is found along the sidewalk boulevard within the City owned ROW. Light poles, transit stops, and bus shelters are the only elements found along the sidewalks with no other

street furniture. Vegetation, including trees are located on private property improving the character of the street in this location.

However, the urban character changes on approaching the residential land uses. There is a presence of dense, mature trees along both sides of the road. The road continues to maintain four travel lanes and a central turning lane with periodic concrete and vegetated road medians located at intersections.

Dense mature trees along the residential uses on Montreal Road between Blair Road and Ogilvie Road looking east

Ogilvie Road to Shefford Road

The section between Ogilvie Road and Shefford Road consists of commercial uses on the south and low-density residential uses on the north side of Montreal Road. The road continues to maintain four travel lanes and concrete and vegetated road medians and auxiliary lanes located at intersections. Designated bike lanes are found on both sides of Montreal Road after Ogilvie Road. The bike lanes in this area periodically transition into cycle tracks, which run flush with the adjacent sidewalk. The sidewalk is approximately 1.8 m wide. Utility poles with overhead cables are prevalent along this section. Sloped vegetative buffers containing mature trees with turf are mixed with intermittent wood / chain link fencing elements, primarily located the residential uses on the west side of Montreal Road. No street trees and minimal vegetative treatment is found along the sidewalk boulevard, within the City owned ROW.

Residential uses located on the west and commercial uses located on the east between Ogilvie Road to Shefford Road on Montreal Road looking east

Shefford Road to the Intersection of Bearbrook Road/Sir George Étienne Cartier Parkway

The section of Montreal Road between Shefford Road and Green's Creek consists of low-density commercial and residential uses with large setbacks leading up to the OR 174 interchange. South of Montreal Road west of the interchange is a small strip mall complex with access only via Shefford Road, and a corresponding parking lot along Montreal Road buffered by a minimally landscaped strip. North of Montreal Road is a midrise retirement residence, also surrounded by parking lots, accessways, and landscaped areas along the road, with additional commercial uses and parking lots further north. The sidewalks on each side terminate after approaching the strip mall and retirement residence, allowing the road to shift in character into a cloverleaf interchange with the OR 174. Montreal Road features a concrete and vegetated median as it approaches this interchange, with the land surrounding the interchange vegetated/landscaped with minimal trees.

Montreal Road looking east towards the highway interchange. The sidewalk terminates after the access point into the northern residential area and is not present at this southern side of the road.

As Montreal Road exits this interchange eastward, it becomes St. Joseph Boulevard. The land surrounding the road east of the interchange to Green's Creek is the NCC Greenbelt, vegetated greenspace with the density of shrubbery and tree coverage increasing closer to the Green's Creek corridor. This area features some Greenbelt pathways throughout but not parallel to the road, giving the road at this section a semi-rural character. The road here has two travel lanes in each direction, with inconsistent sidewalks and inconsistent shoulder space for cyclists. It does not feature a vegetated median. The lack of development at this section further emphasizes its semi-rural character as the road passes through the Greenbelt. Green's Creek runs roughly perpendicular to the road, with the road crossing over the creek as a bridge. The bridge section of the road features sidewalks on both sides and a simple metal handrail/fence for pedestrian safety due to significant grade changes.

St. Joseph Boulevard (Montreal Road) looking east, east of the OR 174 interchange. Green's Creek runs roughly perpendicular to this road section.

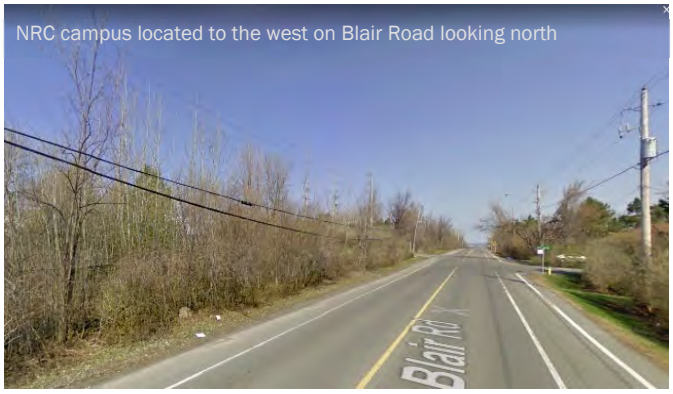
3.3.3.2 Blair Road Limits

North of Montreal Road

Blair Road north of Montreal Road is institutional and employment on the west side and residential on the east side. The road is two lanes wide with paved shoulders. Standard utilities such as light poles, hydro poles and transit stops are located in the City owned ROW. There is a short segment of sidewalk on the east side of Blair Road between Montreal Road and Nicol Street. There are no sidewalks on either side of Blair Road, north of Nicol Street.

The NRC campus is located to the west of Blair Road. The campus is heavily buffered from Blair Road with large groupings of trees progressing to dense woodlots in the majority of the northern section of the road, outside of the City owned ROW. The campus buildings are set back approximately 15+ meters and the setback is primarily occupied by dense vegetation, composed of mature shrubs and trees, and fencing along the perimeter of the NRC property.

Residential uses are located to the east of Blair Road. Buildings are set back approximately 10 metres. Buildings fronting Blair Road in this area tend to have driveway access with adjacent landscaping, ranging from turf to dense vegetation, composed of mature shrubs and trees. Some private driveways and landscaping are within the existing City owned ROW.



Montreal Road to Ogilvie Road

Blair Road south of Montreal Road is institutional and employment on the west side and residential on the east side. The road is two lanes wide with a designated on-road bike lane on both sides. Standard utilities such as light poles, hydro poles and transit stops are located in the City owned ROW. A sidewalk approximately 1.8 m wide is located along residential use on the east side of Blair Road. The east side of the road consists of private driveways accessing Blair Road directly and are lined with overhead utilities. No street trees or vegetative treatment is found along the sidewalk boulevard, within the City owned ROW.

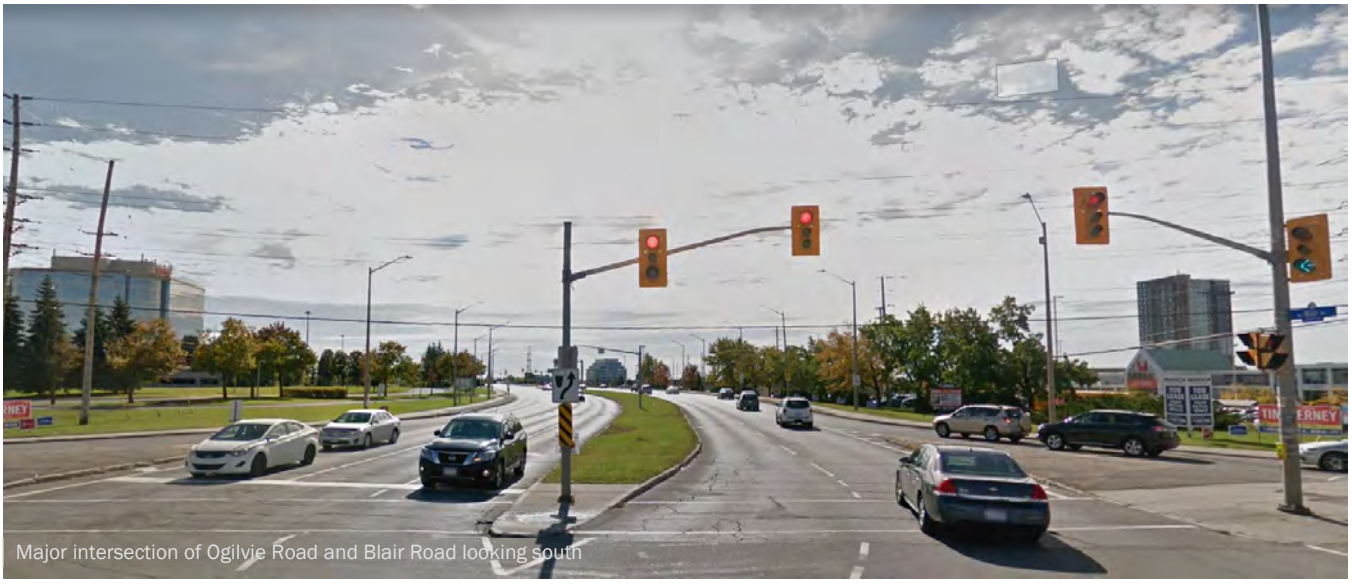
The NRC campus is located west of Blair Road. The main NRC buildings are largely offset from Blair Road by vegetated landscape, composed of low-lying grasses, large multi-stem shrubs and groupings of mature trees. The Canadian Security Intelligence Service (CSIS) campus is located to the southwest of Blair Road and is also buffered by woodlots from the road.


NRC campus located to the west on Blair Road and residential uses located to the east on Blair Road looking south

Ogilvie Road to Gloucester Shopping Centre

The dominant land uses in this section of Blair Road are retail and commercial on the west side of the road and office / retail on the east side of the road. The most notable retail location is the Gloucester Centre, which includes the Confederation Line's Blair Transit Station. Blair Road is up to eight lanes wide south of the Ogilvie Road and Blair Road intersection.

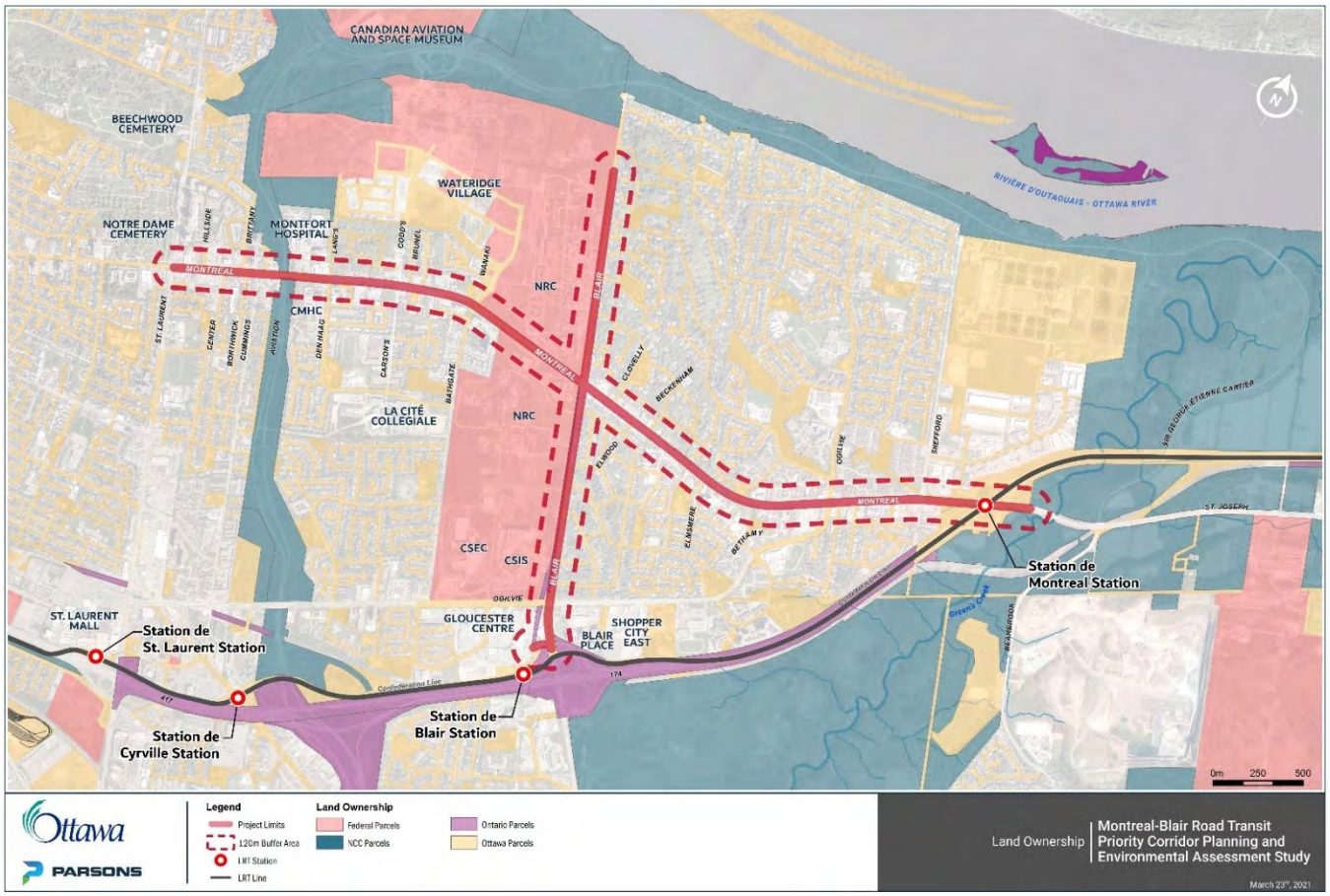
Approximately 1.8 m wide concrete sidewalks are located on both sides of Blair Road. The landscape is primarily composed of turf with sections of mature trees and multi-stem shrubs acting as a buffer between the sidewalk and adjacent properties. Buildings in this section are set back approximately 20 meters from Blair Road. Buildings are separated from the road by a mix of parking lot space with turf buffers, containing mature trees, and transit access routes to Blair Station. No street trees and minimal vegetative treatment is found along the sidewalk boulevard, within the City owned ROW.


Major intersection of Ogilvie Road and Blair Road looking south

3.3.4 Land Ownership

Figure 3-11 illustrates land ownership for the Project Limits. A major landowner is the Federal Government, with the CMHC at 700 Montreal Road, National Research Council (NRC) at 1200 Montreal Road, the CSIS at 1941 Ogilvie Road, Communications Security Establishment (CSE) at 1929 Ogilvie Road and the NCC as the owner of the Aviation Parkway. The Canada Lands Company (CLC), a federal Crown corporation is the owner of the Wateridge Village lands that are in the process of being sold and developed. The NCC owns the Greenbelt area around the Green's Creek corridor, and the lands around the interchange of OR 174 and Montreal Road/St. Joseph Boulevard are City-owned (Ottawa parcels). NCC ownership extends to the easternmost project limits. The CMHC is located on the south side of Montreal Road between the Aviation Parkway and Den Haag Drive. Hydro One owns a corridor along the west side of Blair Road, south of Montreal Road to Ogilvie Road. All other lands not identified as provincial, municipal, federal (including NCC lands) are privately owned with the exception of roadways.

Figure 3-11 Existing Land Ownership for the Project Limits



3.3.5 Climate Change

There is global consensus that the earth's climate is changing at international and regional scales. Due to the variability and rapidly changing breadth of knowledge on climate change and its impacts, scientists have dedicated increasing time and effort to forecasting the timelines, trends, and impacts of extreme weather and climate related events. Although there remains some uncertainty in the predictability of climate change, the scientific consensus is that action must be taken to respond to this threat.

On April 24, 2019, Ottawa City Council declared a climate emergency with the intention to demonstrate how climate change is being put at the forefront of decision-making for the City of Ottawa. In response, the City developed and approved a *Climate Change Master Plan* (CCMP) in 2020 that provides a framework for how Ottawa will mitigate and adapt to climate change over the next three decades. The CCMP supersedes the 2014 Air Quality and Climate Change Management Plan and sets guiding principles, greenhouse gas (GHG) emission targets and short-term priority actions to be undertaken in the next five years.

The City, in partnership with the NCC, has undertaken an extensive exercise to examine the future climate for the National Capital Region (NCR). The outcome of this study, *Climate Change Projections for the National Capital Region* (2020) identified the key climate change effects for the NCR to 2100. Some of the ways in which changes in climate are predicted to change vary by region. At the local level, the municipal government and residents of Ottawa need to consider the impacts of warmer, wetter days, and the stress of extreme events. The existing conditions as they relate to climate change are described as per this study below.

3.3.5.1 Temperature Projections

Examples are given based on the projections by the 2050s with ranges for both lower and higher emission modelled scenarios:

- Increase in Average Annual Temperatures – the average annual temperature for all seasons is projected to increase over time. By the 2050's an increase from a baseline of 6.1°C to a range of 8.2 to 9.3°C.
- Less Cold Extremes – cold extremes are projected to decrease in intensity and frequency. There will be approximately 35% less days of extreme cold from a baseline of 71 days to approximately 53-46 days. The temperature of an extreme cold day will also be less in the future.
- More Warm Extremes – warm extremes are projected to increase in both intensity and frequency. There will be 3-4 times as many extreme heat days above 30°C, rising from 11 per year to 32-43 days per year.
- Change in Seasonal Characteristics – the first and last days of frost (autumn and spring respectively) are projected to be later and earlier in the future. By the 2050's this will mean winter will be approximately 5 weeks shorter and spring will begin 2 weeks earlier.
- Shift in Freeze-Thaw Cycles – freeze-thaw cycles are predicted to increase by 33% during winter (December – February) and decrease during spring (March- May) and fall (September – November) as temperatures warm.

3.3.5.2 Precipitation Projections

Examples are given based on the projections by the 2050s with ranges for both lower and higher emission modelled scenarios:

- Increase in Total Annual Precipitation – the total annual precipitation amount (including snow and rain) is projected to increase by 8%, concentrated in the winter, spring and autumn seasons, with no increases projected for summer (June – September). Total increases from 921 mm/year are projected to increase to 979-993 mm/year.
- More Intense Precipitation (Rain) – the annual maximum precipitation that falls in one day is expected to increase by 14% from the baseline 37 mm to 41-42 mm.
- Decrease in Total Annual Snowfall – the total annual snowfall is projected to decrease by 20% in the future from 223 cm to 179-184 cm.
- Shorter Snow Season – the first snowfall of the season is projected to be later and the last snowfall is expected to be earlier. Overall, the number of days with snow cover will decrease from 115 to approximately 95 days in the future.
- Increased Variability in Extreme Snow – projections indicate a decrease in the maximum snow depth. The maximum 1-day snowfall findings indicate potential for increased amounts from 20 cm to a maximum of 22 cm in 2050, but these results are inconclusive.

Humidity, wind, extreme events and other weather phenomena such as freezing rain, tornadoes, lightning, hurricanes, and wildfires were also examined. No trends in average wind speeds or humidity were identified, but the study concluded that high wind chill is expected to decrease, the number of high humidity days to increase. Future conditions also favour an increase in extreme weather events.

3.3.6 Archaeological Resources

The determination of archaeological potential is based on historical travel routes, proximity to watercourses, degree of previous disturbance and unique land formations. For the purposes of determining archaeological potential, the archaeological Study Area is defined as the Project Limits plus a 10-metre buffer around them. A Stage 1 Archaeological Assessment (**Appendix B**) was completed for the Project and determined that the existing road ROW for Montreal and Blair Roads contains low archaeological potential while areas beyond the ROW contain archaeological potential and

further archaeological assessment will be undertaken as early as possible during detailed design an prior to any ground disturbing activities. This report did not include assessment of the potential bus loop location. Detailed maps showing specific areas of archaeological potential can be found in the report in **Appendix B**.

The results from the Confederation Line East Extension (LRT) Stage 2 Archaeological Assessment (AECOM, 2017) were also considered because it included the lands where the bus loop for his project was considered (located just east of the Project Limits). The results of that Stage 2 AA indicated that the area does not contain archaeological potential (AECOM, 2017).

3.3.7 Built Heritage Resources and Cultural Heritage Landscapes

A Cultural Heritage Report was undertaken for the Project to provide an overview of recognized and potential Cultural Heritage Resources (CHR) which includes built heritage resources (BHR) and cultural heritage landscapes (CHL). BHR is defined as a building, structure, monument, installation or any manufactured remnant that contributes to a property's cultural heritage value or interest as identified by a community, including an Indigenous community. BHRs are generally located on a property that has been designated under Parts IV or V of the *Ontario Heritage Act* (OHA), or included on local, provincial and/or federal registers. CHL means a defined geographical area that may have been modified by human activity and is identified as having cultural heritage value or interest by a community, including an Indigenous community. Farms and cemeteries are examples of CHLs.

The complete report can be found in **Appendix B**. For the purposes of determining cultural heritage, the cultural heritage Study Area is defined as the Project Limits plus a 10-metre buffer around them (**Figure 3-12**). This report did not include assessment of the potential bus loop location. The report included completion of the Cultural Heritage Screening Checklist, review of previously completed Cultural Heritage reports, a review of online databases and historical and environmental background research of the cultural heritage Study Area.

There are two Recognized Federal Heritage Building Review Office (FHBRO) buildings located on one property within CHR-6 property:

- NRC Campus 1191 Montreal Road buildings M-12 and M-20 (CHR-6).

The Aviation Parkway (CHR-2) is one of the NCC's Scenic Parkways and is considered a CHL.

The following three properties within the cultural heritage Study Area were added to the Municipal Heritage Register as listed under Section 27, Part IV of the *Ontario Heritage Act* (OHA) in December 2019:

- Notre-Dame Cemetery, 435-455 Montreal Road (CHR-1);
- 701 Montreal Road (CHR-4); and
- c.1860 stone house within the NRC Campus at 1191 Montreal Road (CHR-6).

No properties designated under Section 29, Part IV of the OHA are located within the cultural heritage Study Area. No provincial heritage properties are located within the cultural heritage Study Area. No Ontario Heritage Trust (OHT) properties or easements exist within the cultural heritage Study Area.

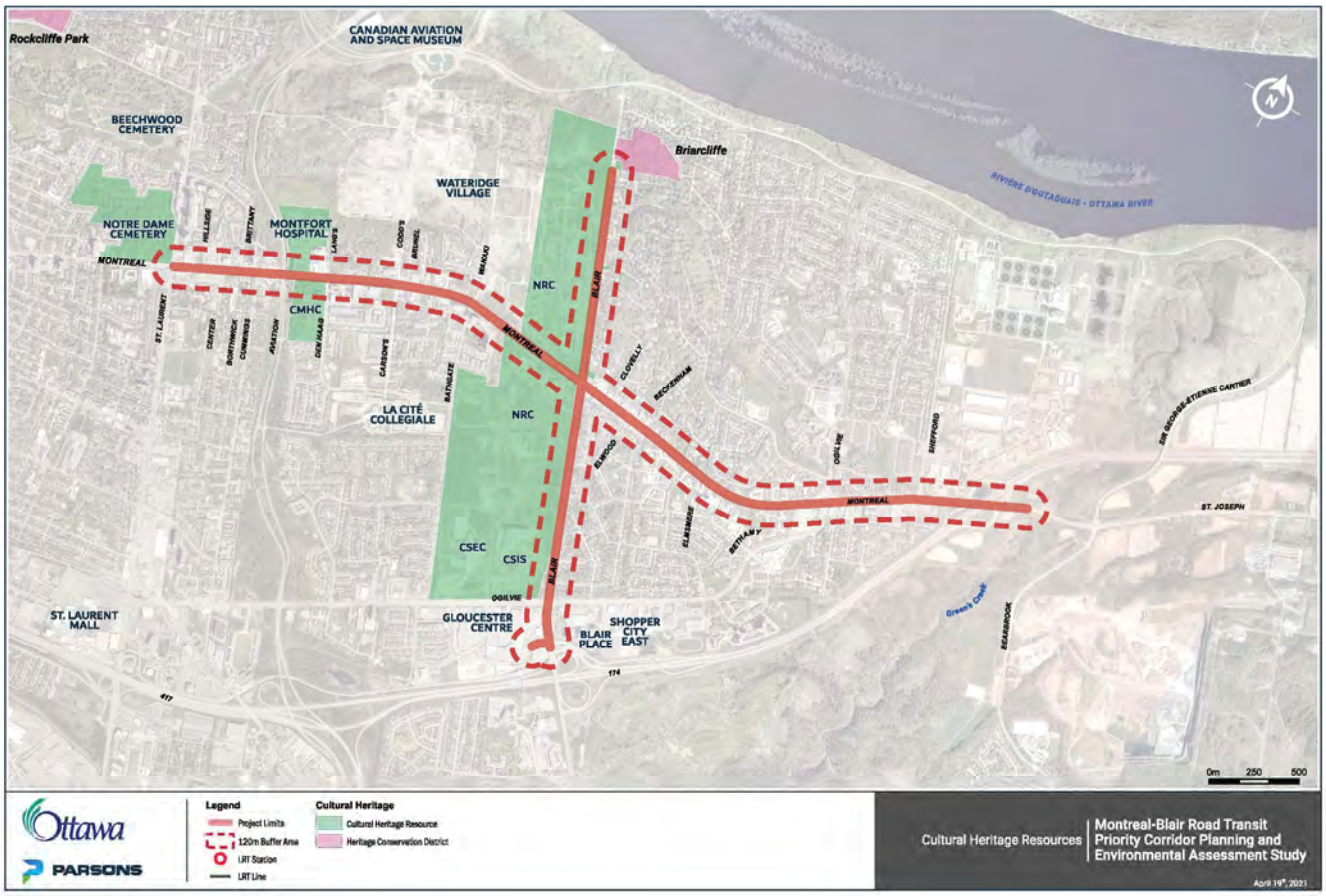
One property, 2 Briarcliffe Drive (CHR-9), designated under Part V of the OHA is located within the cultural heritage Study Area.

Four additional potential CHRs were identified during the screening process:

- The Canada Housing and Mortgage Corporation building, 700 Montreal Road (CHR-3);
- Montfort Hospital, 713 Montreal Road (CHR-5);
- 741 Blair Road (CHR-7); and,
- 571 Blair Road (CHR-8).

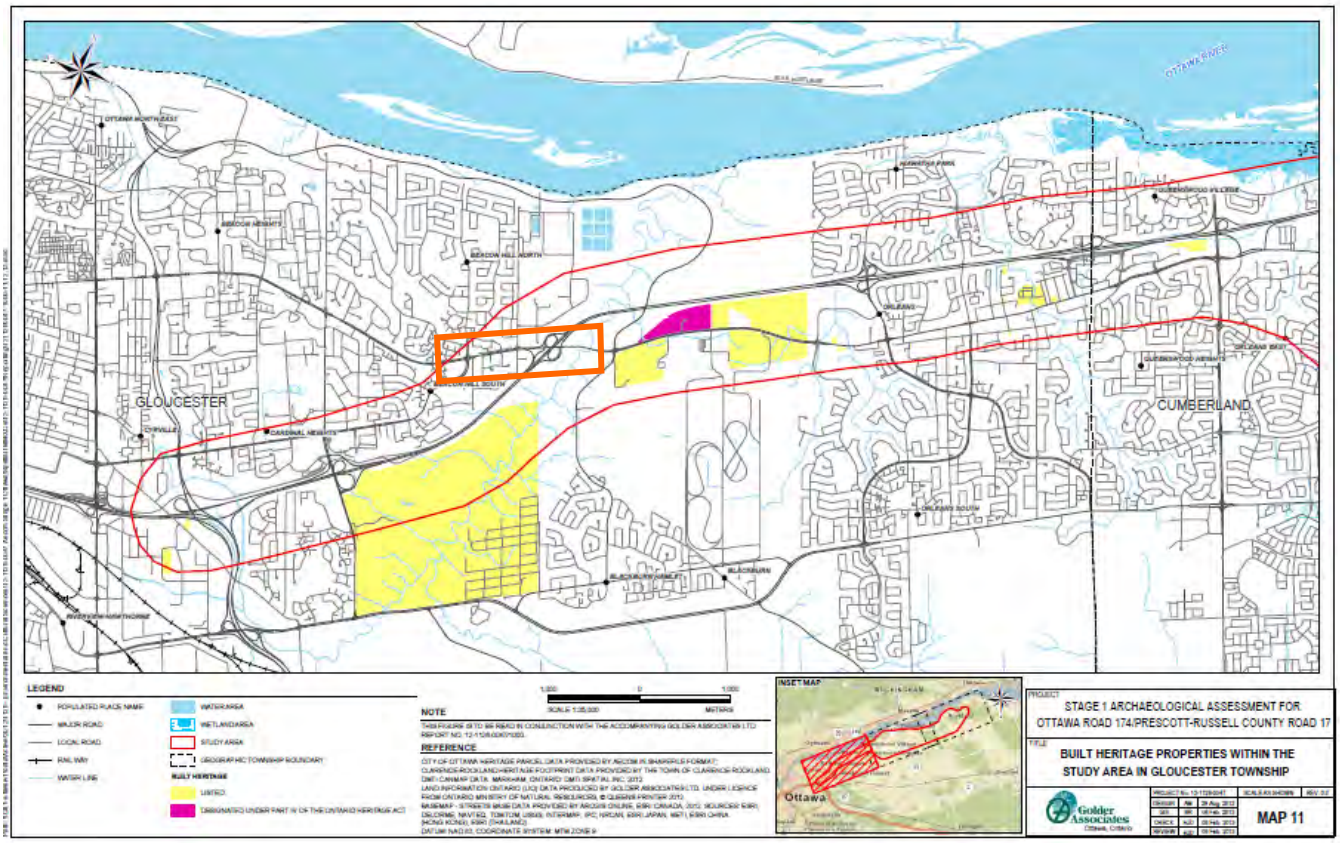
These properties have been screened for their potential to meet the criteria outlined in Ontario Regulation 9/06: *Criteria for Determining Cultural Heritage Value or Interest under the Ontario Heritage Act* and it was determined that they have the potential to meet one or more of the criteria.

Figure 3-12 Cultural Heritage Resources



The results from the widening of OR 174/County Road 17 Stage 1 AA (AECOM, 2016) were also considered because it included the lands where the bus loop for this project was considered (located just east of the Project Limits). The results indicate that 1367 St. Joseph Boulevard, the Butler House heritage property is designated under Part IV of the OHA and 1300 St. Joseph Boulevard is a listed property (**Figure 3-13**). They are both located approximately 1km east of the OR 174 interchange beyond the Study Area shown in pink in **Figure 3-13**.

Figure 3-13 Built Heritage Properties (Golder, 2013)



3.3.8 Indigenous Land Claims

The Project Limits are within the Algonquins of Ontario land claim area. There is no known current use of lands and/or resources for traditional purposes nearby. Known areas used for traditional fishing include the Ottawa River which is located approximately 1.5 km from the Study Area (Algonquins of Ontario, 2014). Consultation was undertaken with identified groups that may have an interest in the Project Limits and circulated the Stage 1 AA and Cultural Heritage Report for review and comment.

As part of the development of the Wateridge Village at the Former CFB Rockcliffe site north of Montreal Road, Canada Lands Company (CLC) held consultations with the Algonquins of Ontario (AOO) to identify ways in which the Algonquin presence and heritage can be reflected on the site. This is recognized through the installation of commemorative elements, the design of park spaces and the naming of streets to highlight the legacy of both the Algonquin heritage and the Military and Aviation heritage.

3.3.9 Noise, Air Quality and Vibration

Existing conditions for noise, air quality and vibration were assessed for the Project. The complete report can be found in **Appendix B**. For the purposes of this assessment, the Study Area as it relates to noise, air quality and vibration is defined as 150m buffer of the Project Limits. Sensitive receivers in the Study Area include schools, hospitals, daycares, the outdoor living areas to residential houses, as well as the NRC has indicated that they have laboratories that are sensitive to ground vibrations.

3.3.9.1 Noise

Environmental noise levels in the Study Area range based on proximity to high-volume roadways. The City of Ottawa's Environmental Noise Control Guidelines (ENCG) (2016) objective level is 55 decibel unit (dBA) before noise attenuation should be provided as part of transportation infrastructure projects. Environmental noise levels are elevated around Montreal and Blair Road and will exceed 55 dBA where receptors are located in close proximity to these arterial and other

collector roadways. Noise levels are moderate to low and will fall below 55 dBA as distance increases from arterial roads. The NRC is a known noise source, however, noise emissions from the NRC or other institutional/industrial facilities are considered stationary noise. Under the provincial and City guidelines stationary noise is evaluated separately from transportation sources.

3.3.9.2 Air Quality

In the Study Area, roadway vehicle traffic is the primary source of air-borne pollutants. Emissions from roadway vehicles include Carbon Monoxide (CO), Hydrocarbons (HC), Oxides of Nitrogen (NOx) and Particulate Matter (PM), among other volatile organic compounds (VOC), contribute to ambient air quality levels. The concentrations of these pollutants produced by vehicle emissions are low to moderate through the Study Area.

3.3.9.3 Ground Vibrations and Ground Borne Noise Assessment

Heavy roadway vehicles on uneven terrain can produce perceptible levels of ground vibrations, and incidentally ground-borne noise. The highest concentrations of ground vibrations are sourced from roadways and at peak travel times. Ground vibrations for the Study Area are low to moderate with the primary source being Highway 417/OR 174. Consideration has also been given to the implementation of the future LRT Confederation Line which will also contribute to ground vibrations in the Study Area.

3.4 Natural Environment

The natural environment existing conditions provides a high-level summary of natural environment features of provincial interest as identified by the PPS (MMAH, 2020), MECP and the City's Official Plan (2013). Existing Natural Environment Features are shown in **Figure 3-15.** The complete report is provided in **Appendix B**.

For the purposes of this assessment, the Study Area as it relates to the natural environment is defined as a 120m buffer of the Project Limits which is consistent with the minimum distance to natural features before potential impacts require detailed evaluation according to Provincial Policy (MMAH, 2020).

Terrestrial and aquatic environments are limited because the Study Area is located within a highly developed, urban area. The eastern edge of the Study Area falls within the Greenbelt, and crosses NCC lands surrounding Green's Creek. The Study Area is located within the Kemptville Ecodistrict 6E-12. This area consists of limestone plain and sandstone bedrock with sand, silt, loam, and clay soils (Henson, B.L. and K.E. Brodribb. , 2005). The northern boundary of the Study Area includes a mixture of the Russell and Prescott Sand Plains and the Ottawa Valley Clay Flats. Vegetated natural cover in this Ecodistrict is primarily deciduous forest at 37%, where 22% is composed of swamp wetlands (Henson, B.L. and K.E. Brodribb. , 2005).

3.4.1 Terrestrial Environment

The Study Area is located within the Great Lakes-St. Lawrence Forest Region, within the forest section of Upper St. Lawrence. Although the Study Area was once dominant with deciduous forests of sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*), basswood (*Tilia americana*), and white ash (*Fraxinus americana)* (Rowe, 1972) to name a few; it is now highly developed with urban lands and only small, fragmented deciduous woodlots occur. One area of larger woodland is identified within the Green's Creek corridor, consisting of mixed and deciduous woodlots at varied stages of succession and dominated by white ash, sugar maple, trembling aspen (*Populus tremuloides*), eastern hemlock (*Tsuga canadensis*), white spruce (*Picea glauca*), and white pine (*Pinus strobus*) (Morrison Hershfield Limited, 2017a) The overall conifer composition of limited areas of mixed woodlots within the Study Area is approximately 25%.

Components of the Natural Heritage System, identified on Schedule L in the City's Official Plan, are located within the Study Area. The Natural Heritage System in general is defined to include areas such as Provincially Significant Wetlands, Significant Woodlands, Significant Valleylands, Areas of Natural and Scientific Interest (ANSI) and Urban Natural Features and other natural features. Natural Heritage Features that are located within the Study Area are discussed below.

3.4.1.1 Wildland Fire Risk

Table 3-3 provides a description of forest species composition categorized by wildland fire risk level as described in the Wildland Fire Risk Assessment and Mitigation Reference Manual (Ministry of Natural Resources and Forestry (MNRF), 2017). The risks associated with wildland fire in the Study Area are anticipated to be generally low, with some areas of moderate risk based on the MNRF's generalized wildland fire hazard data (MNRF 2017) which provides a coarse scale assessment of areas with the greatest potential for risks associated with wildland fire.

As the woodlands present in the Study Area are dominated by deciduous species, or have approximately 25% coniferous cover, and woodland cover appears to have been reduced in areas categorized by the MNRF's wildland fire hazard dataset as moderate, the overall fire risk for the Study Area is low.

Table 3-3 Hazardous Forest Types Characteristic and Risk Level (MNRF, 2017)

Wildland Fire Risk Level	Forest Species Composition
EXTREME	• Immature jack pine • Boreal spruce • Black or white spruce • Balsam fir • Immature red, white pine
HIGH	• Mature jack pine • Mixed wood with >50% conifer (jack pine, spruce, balsam fir, immature red or white pine)
MODERATE TO LOW	• Mixed wood forests ranging from 25% (low) to 50% (moderate) conifer composition • Mature red, white, and Scots pine • Hardwood/deciduous forests composed of maple, birch, oak, poplar, ash etc. • Typically standing cedar, hemlock and tamarack are low risk • Mature red, white and Scots pine with clean or deciduous understory are low risk

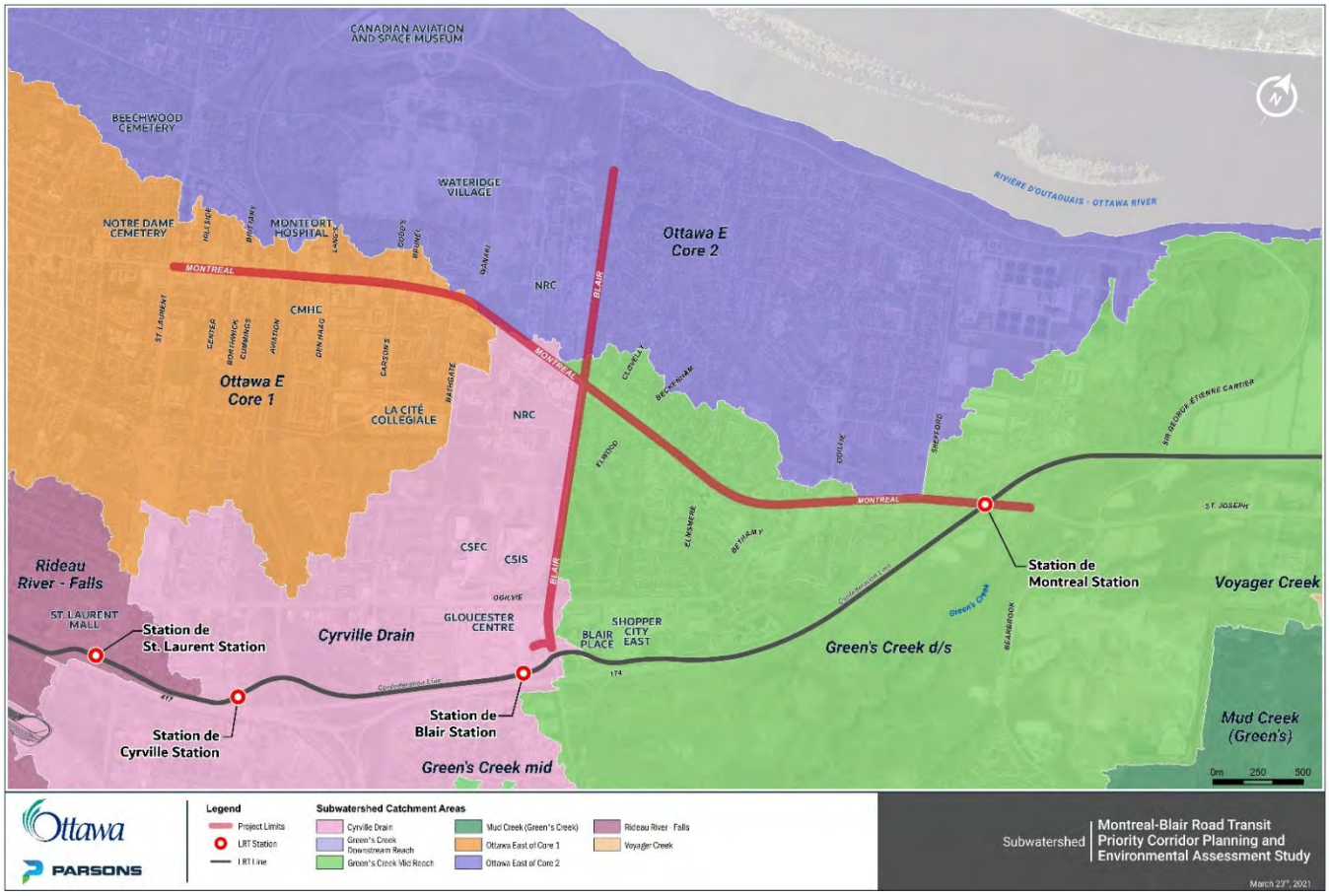
3.4.2 Aquatic Environment

The Study Area is within the Ottawa River system as it occupies the confluence of the Rideau and Ottawa Rivers. Subwatersheds for the Study Area are listed in Table 3-4 and shown in Figure 3-14.

Table 3-4 Watershed and Subwatersheds related to the Study Area

Drainage Area	Watershed	Subwatershed
Blair Road north Project Limit to 130m north of Montreal Road	Ottawa River East	Ottawa East of Core 2
Montreal Road from Burma Road/Bathgate Drive to the west Project Limit	Ottawa River East	Ottawa East of Core 1
Blair Road 130m north of Montreal Road south and east sides to Claver Street	Green's Creek	Green's Creek Downstream Reach
Blair Road at Montreal Road south and west to south Project Limit	Green's Creek	Cyrville Drain

Figure 3-14 Subwatershed Catchment Areas related to the Study Area



Surface water features may include: headwaters, rivers, streams, seepage areas and associated riparian areas. Due to the high degree of urbanization surface water features are limited and highly altered within the Study Area. Two watercourses are located within the Study Area, these are Green's Creek and an unnamed watercourse/drainage that acts as a tributary to Green's Creek.

Green's Creek crosses the eastern limits of the Study Area between the Montreal Road/St-Joseph Boulevard and OR 174 interchange and Bearbrook Road. It is classified as a warmwater system (Rideau Valley Conservation Authority (RVCA), 2016). The unnamed watercourse appears to connect from drainage located on the north side of OR 174 flowing parallel to Montreal Road/St-Joseph Boulevard before emptying through three culverts and into Green's Creek.

Two stormwater management ponds are located in close proximity to the unnamed watercourse (one under construction at the time of this report). These are located within the northwest and southeast segments of the cloverleaf at the Montreal Road/St-Joseph Boulevard and OR 174 interchange.

3.4.2.1 Fish and Fish Habitat

Fish habitat within the Study Area is limited to Green's Creek and the downstream 50 m of the unnamed watercourse.

Green's Creek is a warmwater system that contains habitat that supports various fish species that have adapted warm to cool-water thermal classifications. A total of 44 distinct fish species have been observed from Green's Creek fish sampling records from 2000 to 2016 (**Table 3-5**) (RVCA, 2016). No Threatened or Endangered fish species were reported. RVCA has identified one species ranked as Special Concern under Schedule 1 of the SARA, River redhorse (*Moxostoma carinatum*), as having potential to occur within Green's Creek (RVCA, 2016).

Dip-netting and observation surveys determined that the unnamed watercourse does not support fish or provide direct or indirect fish habitat (Morrison Hershfield Limited, 2017b). A portion of the watercourse flows through an entombed culvert and extends down a steep slope which further prohibits movement of fish. (Morrison Hershfield Limited, 2017b).

Table 3-5 Summary of Fish Species observed in Green's Creek (RVCA 2016)

Common Name	Scientific Name
Banded killifish	*Fundulus diaphanus*
Black crappie	*Pomoxis nigromaculatus*
Blacknose dace	*Rhinichthys atratulus*
Blacknose shiner	*Notropis heterolepis*
Bluegill	*Lepomis macrochirus*
Bluntnose minnow	*Pimephales notatus*
Brassy minnow	*Hybognathus hankinsoni*
Brook stickleback	*Culaea inconstans*
Brown bullhead	*Ameiurus nebulosus*
Burbot	*Lota lota*
Central mudminnow	*Umbra limi*
Channel catfish	*Ictalurus punctatus*
Common carp	*Cyprinus carpio*
Common shiner	*Luxilus cornutus*
Creek chub	*Semotilus atromaculatus*
Darter species	Etheostoma sp.
Emerald shiner	*Notropis atherinoides*
Fathead minnow	*Pimephales promelas*
Freshwater drum	*Aplodinotus grunniens*
Golden shiner	*Notemigonus crysoleucas*
Goldfish	*Carassius auratus*
Hornyhead chub	*Nocomis biguttatus*
Largemouth bass	*Micropterus salmoides*
Logperch	*Percina caprodes*
Longnose dace	*Rhinichthys cataractae*
Longnose gar	*Lepisosteus osseus*
Mimic shiner	*Notropis volucellus*
Northern pearl dace	*Chrosomus eos*
Northern pike	*Esox lucius*
Northern redbelly dace	*Chrosomus eos*
Pumpkinseed	*Lepomis gibbosus*
Quillback	*Carpiodes cyprinus*
River redhorse	*Moxostoma carinatum*
Rock bass	*Ambloplites rupestris*
Sauger	*Sander canadensis*
Shorthead redhorse	*Moxostoma macrolepidotum*
Silver redhorse	*Moxostoma anisurum*
Smallmouth bass	*Micropterus dolomieu*
Spotfin shiner	*Cyprinella spiloptera*
Trout-perch	*Percopsis omiscomaycus*
Walleye	*Sander vitreus*
White sucker	*Catastomus commersonii*
Yellow bullhead	*Ameiurus natalis*
Yellow perch	*Perca flavescens*

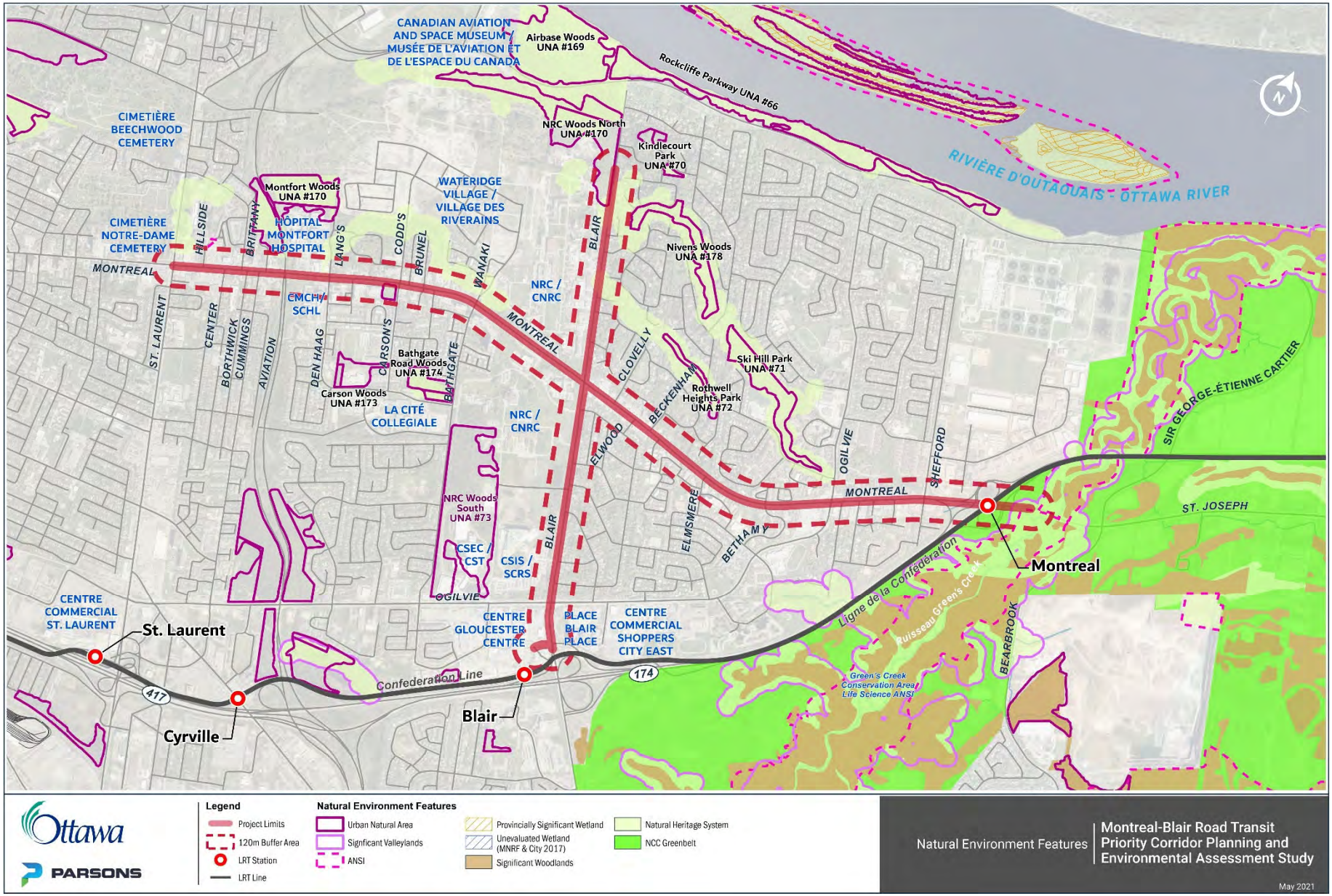
3.4.3 Wetlands

No wetlands within the Study Area have been designated as provincially significant. The nearest PSWs include Duck Island Marsh, located approximately 1.5 km north of the Study Area, in the Ottawa River, and Mer Bleue, located approximately 5 km southeast of the Study Area.

No other wetlands within the Study Area have been evaluated as per the provincial or federal evaluation system and therefore considered absent from the Study Area.

Unevaluated wetlands are mapped by the MNRF and the City of Ottawa (2017) in the Study Area as shown in **Figure 3-15**. Two unevaluated wetland pockets occur within the Study Area. The first one is located approximately 510m south of Montreal Road, directly adjacent to the west side of Blair Road.

Figure 3-15 Natural environment features present in the Study Area



3.4.4 Areas of Natural and Scientific Interest

There are two ANSIs located within the Study Area (**Figure 3-15**).

St. Laurent – Montreal Road is a regionally significant Earth Science ANSI that occurs within the Study Area. This natural heritage feature is a small outcrop of fossiliferous Eastview limestone with thin shale interbeds. Such rock is exposed at the back of the Hillside Plaza on Montreal Road (Ministry of Natural Resources (MNR), 1987).

The Green's Creek Conservation Area Life Science ANSI intersects the eastern limits of the Study Area, between the Montreal Rd/St-Joseph Boulevard and OR 174 Interchange to the west and Bearbrook Road to the east. The Green's Creek ANSI extends from Anderson Road northwards to the Ottawa River (Natural Heritage Information Centre (NHIC), 2021) and includes 425 ha of mixed and deciduous woodland noted for significance as wildlife habitat, ecological corridors, and the presence of rare plant species (Morrison Hershfield 2017a).

3.4.5 Significant Valleylands

The identification and evaluation of significant valleylands rests on the municipal planning authorities. The City of Ottawa has defined significant valleylands as having slopes greater than 15% and a length of more than 50 m with water present for some period of the year, excluding manufactured features such as pits and quarries (City of Ottawa 2013).

Green's Creek is described as having steep, forested slopes (NCC 2020) with its riparian corridor extending for over 5,000 m between Innes Road and the Ottawa River (**Figure 3-15**). The steep slopes of Green's Creek are identified as significant valleyland as well as classified as "unstable" on Schedule K of the Official Plan (City of Ottawa 2013).

3.4.6 Significant Woodlands

The Study Area is absent of significant woodlands (**Figure 3-15**). The City has adopted new guidelines and criteria for the identification and evaluation of significant woodlands (2019). It is possible that following the revised criteria and guidelines, significant woodlands may exist within the Study Area.

3.4.7 Urban Natural Areas and Urban Natural Features

The City of Ottawa undertook the Urban Natural Areas Environmental Evaluation Study (UNAEES Muncaster and Brunton 2005 & 2006) in conjunction with the Greenspace Master Plan (City of Ottawa, 2006). The purpose of the UNAEES was to identify woodlands, wetlands and ravines throughout the City of Ottawa urban area and evaluate their environmental significance.

Once the UNAEES was completed, those Urban Natural Areas (UNAs) worthy of protection and/or acquisition were identified using strategic guidelines set forth within the Urban Natural Features Strategy (City of Ottawa, 2007). UNAs identified as priority areas included high and moderate-rated sites, natural features currently in City ownership (including sites with low environmental rating), areas with recognized planning status, and the ability to promote environmental stewardship on privately-owned lands with a low environmental rating (City of Ottawa 2007). A total of 40 UNAs were re-designated to Urban Natural Features (UNF) based on this strategy. UNFs are shown on Schedule B of the OP (2013) as land use designations and are included on Schedule L as part of the City's Natural Heritage System.

Four UNAs are located in the Study Area: NRC Woods North (UNA 170), Montfort Hospital Woods (UNA 171), Assaly Woods (UNA 172), and Niven Woods (UNA 178) (**Figure 3-15**). Only UNA 171 and 178 have been designated as UNFs and overlap the Study Area and therefore are described further below.

Montfort Hospital Woods (UNA 171) is approximately 13 hectares (ha) in size and located north of Montreal Road, skirting the Aviation Parkway. The eastern woodland behind the hospital has been described as a mature upland deciduous forest composed of Manitoba maple, trembling aspen, American elm, Norway maple, sugar maple, and American beech. Whereas the woodland portion west of Aviation Parkway has been described as a young lowland deciduous forest with white ash, ironwood, trembling aspen, bur oak, and green ash (Muncaster and Brunton, 2005 & 2006). This is an isolated feature with limited connectivity and interior habitat for wildlife. A major paved pathway is also present along the eastern edge of woods west of Aviation Parkway thereby influencing edge effects. Small, informal footpaths also occur throughout

contributing to further disturbance of the site. It received an overall ecological rating of Moderate due to habitat maturity, native flora biodiversity, and its large size (Muncaster and Brunton, 2005).

Niven Woods (UNA 178) is approximately 6.3 ha in size and located east of Blair Road, north of Montreal Road. It is described as a large remnant upland mixed forest on steep, slopping shale escarpment. Tree canopy consists of; sugar maple, eastern hemlock, ironwood and eastern white cedar. It received an overall ecological rating of Moderate due to habitat maturity, connectivity, representative flora, as well as providing slope stabilization, and wildlife habitat/linkage opportunities.

3.4.8 Linkage Features

A component of the Natural Heritage System incorporates and promotes ecological functions such as linkages/corridors. Corridors should be preserved and/or designed to accommodate the natural movement/life patterns of flora and fauna as movement is key for biodiversity conservation and long-term viability of ecological systems (MNR, 2010). OP Amendment (OPA) 150 describes and maps areas that provide linkage opportunities between significant features (City of Ottawa 2013, Schedule L). No areas identified in OPA 150 are within the Study Area.

The Study Area contains portions of the Natural Heritage System that may function as linkage features (**Figure 3-15**). The minimal existing natural features within the Study Area limits the opportunity for wildlife corridors; the exception is Green's Creek. Particularly, the Green's Creek Life Science ANSI is identified as a major wildlife corridor as it provides connectivity between the Mer Bleue PSW and smaller habitat features to the south of the Study Area, with the Ottawa River. Additionally, Niven Woods (UNA 178) has been identified to contain connectivity to other UNAs, such as Kindlecourt Park (UNA 70), Rothwell Heights Park (UNA 72), and Ski Hill Park (Muncaster and Brunton 2005), which therefore has potential to act as a linkage feature within the Study Area.

No formal natural links have been identified for the Study Area within the *Greenspace Master Plan* (City of Ottawa 2006). Yet, it is acknowledged that most UNAs are no longer connected, and natural corridors should be maintained to support them. The Plan (2006) further states that: "the same pathways and corridors that link parks and open spaces can also connect natural areas." Major open space, parklands, and remnant woodland features are present within the Study Area and in some cases coincide with the Natural Heritage System. Altogether such features could provide connectivity for wildlife movement.

3.4.9 Species at Risk and Species of Conservation Concern

A review of online databases, City of Ottawa, RVCA, and MNRF and MECP correspondence identified a number of records of Species at Risk (SAR) and/or Species of Conservation Concern that exist either within 1 km (as per NHIC) or 10 km (as per wildlife atlas records) of the Study Area (**Table 3-6**). Twelve SAR that have potential to occur in the Study Area based on the presence of suitable habitat are highlighted in grey in **Table 3-6** and discussed below.

Table 3-6 SAR and Species of Conservation Concern wildlife records

Common Name	Scientific Name	S-Rank[1]	ESA Status[2]	SARA (Schedule 1) Status[3]
PLANTS				
Butternut	*Juglans cinerea*	S2?	Endangered	Endangered
Sartwell's Sedge	*Carex sartwelli*	S4	Not at Risk	Not at Risk
Foxtail Sedge	*Carex alcopecoidea*	S4	Not at Risk	Not at Risk
AMPHIBIANS				
Western Chorus Frog	*Pseudacris maculata*	S3	Not at Risk	Threatened
REPTILES				
Blanding's Turtle	*Emydoidea blandingii*	S3	Threatened	Threatened
Northern Map Turtle	*Graptemys geographica*	S3	Special Concern	Special Concern
Snapping Turtle	*Chelydra serpentina*	S3	Special Concern	Special Concern
Eastern Milksnake	*Lampropeltis triangulum*	S4	Not at Risk	Special Concern

Common Name	Scientific Name	S-Rank[1]	ESA Status[2]	SARA (Schedule 1) Status[3]
BIRDS				
Bald Eagle	*Haliaeetus leucocephalus*	S2N, S4B	Special Concern	No Status
Bank Swallow	*Riparia riparia*	S4B	Threatened	Threatened
Barn Swallow	*Hirundo rustica*	S4B	Threatened	Threatened
Black-crowned Night-heron	*Nycticorax nycticorax*	S3B, S3N	No status	No status
Bobolink	*Dolichonyx oryzivorus*	S4B	Threatened	Threatened
Canada Warbler	*Cardellina canadensis*	S4B	Special Concern	Threatened
Chimney Swift	*Chaetura pelagica*	S4B, S4N	Threatened	Threatened
Common Nighthawk	*Chordeiles minor*	S4B	Special Concern	Threatened
Eastern Meadowlark	*Sturnella magna*	S4B	Threatened	Threatened
Eastern Wood-pewee	*Contopus virens*	S4B	Special Concern	Special Concern
Peregrine Falcon	*Falco peregrinus*	S3B	Special Concern	No Status
Wood Thrush	*Hylocichla mustelina*	S4B	Special Concern	Threatened
MAMMALS				
Little Brown Myotis	*Myotis lucifugus*	S4	Endangered	Endangered
Northern Myotis	*Myotis septentrionalis*	S3	Endangered	Endangered
Tri-coloured Bat	*Perimyotis subflavus*	S3?	Endangered	Endangered
INVERTEBRATES				
Monarch	*Danaus plexippus*	S2N, S4B	Special Concern	Special Concern
FISH				
Channel Darter	*Percina copelandi*	S2	Special Concern	Special Concern
Lake Sturgeon	*Acipenser fulvescens pop.3*	S2	Endangered	No Status
Northern Brook Lamprey	*Ichthyomyzon fossor*	S3	Special Concern	Special Concern
River Redhorse	*Moxostoma carinatum*	S2	No Status	Special Concern

Status Source:

[1]S-Rank (MNRF 2019)

S1: Critically Imperiled – Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.

S2: Imperiled – Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

S3: Vulnerable – Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4: Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5: Secure – Common, widespread, and abundant in the nation or state/province.

SNA: Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

S#S#: Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

SR or ? - Recorded within a nation or subnation, but local status not available or not yet determined. When combined with a global rank of G1 to G3, local status is 'Indeterminate,' but the entity is nevertheless presumed vulnerable, if still extant.

N – rank for non-breeding populations in the province.

B – rank for breeding populations in the province.

[2]**ESA** (Endangered Species Act) Status (Government of Ontario 2020)

[3]**SARA** (Species at Risk Act) Status (federal status - listed) (Government of Canada, 2021)

Extinct - A species that no longer exists anywhere.

Extirpated (EXT) - Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.

Endangered (END) - Lives in the wild in Ontario but is facing imminent extinction or extirpation.

Threatened (THR) - Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.

Special Concern (SC) - Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.

Not at Risk (NAR) - A species that has been evaluated and found to be not at risk.

Data Deficient (DD) - A species for which there is insufficient information for a provincial status recommendation.

- **Butternut:** designated as Endangered under the ESA and the SARA. Suitable habitat is present within the Study Area in the form of deciduous woodlands. In Ontario, Butternut generally grows alone or in small groups in deciduous forests, in moist soil, and is intolerant of shade.
- **Sartwell's Sedge**: designated as Regionally Significant in the City of Ottawa (Muncaster and Brunton, 2005 & 2006). There is suitable habitat present within the Study Area in the form of wet meadows, marsh edges, and ditches. Records from 2010 indicated that the only population of this sedge within the City of Ottawa was located within the Study Area, however surveys from 2017 indicate that this species is no longer present in its original location.
- **Foxtail Sedge**: designated as Regionally Significant in the City of Ottawa (Muncaster and Brunton, 2005 & 2006). There is suitable habitat present within the Study Area in the form of wet meadows, marsh edges, and ditches.
- **Western Chorus Frog:** designated as Threatened under the SARA. There is limited suitable habitat present in the Study Area in the form of seasonally wet meadows and wetlands. This species has not been recorded in proximity to the Study Area since 2009.
- **Barn Swallow:** designated as Threatened under the ESA and the SARA. This bird receives species and habitat protection on private, provincial and federal lands. In addition, individuals, nests, and eggs are protected under the MBCA. There is suitable habitat present within the Study Area. Barn Swallows are frequently found foraging over farmlands or rural areas which may include the Greenbelt lands and primarily nests on buildings, bridges and culvert structures near or over water.
- **Chimney Swift**: designated as Threatened under the ESA and the SARA. This bird receives species and habitat protection on private, provincial and federal lands. In addition, individuals, nests, and eggs are protected under the MBCA. There is suitable habitat present within the Study Area in the form of open chimneys. Chimney Swift are commonly found in urban areas near buildings, nesting in chimneys.
- **Common Nighthawk**: designated Special Concern under the ESA and Threatened under the SARA. This bird receives species and habitat protection on federal lands. In addition, individuals, nests, and eggs are protected under the MBCA. There is suitable habitat present within the Study Area in the form of flat gravel roof-tops. Common Nighthawk prefers open pastures and mixed/coniferous forests in natural settings.
- **Eastern Wood-pewee**: designated Special Concern under the ESA and SARA. Individuals, nests, and eggs are protected under the MBCA. There is suitable habitat present within the Study Area in the form of deciduous woodlands and parklands. This species prefers to nest in deciduous, mixed forests in forest gaps and/or edges. They are also known to inhabit parklands.
- **Peregrine Falcon**: designated as Special Concern under the ESA. There is suitable habitat present within the Study Area in the form of tall buildings. They nest on tall, steep cliffs or ledges of buildings, often near water.
- **Little Brown Myotis**: designated as Endangered under the ESA and the SARA. There is suitable habitat present within the Study Area in the form of deciduous woodlands. They prefer to roost in hollow trees or buildings, feeding primarily in wetlands and forest edges.
- **Northern Myotis**: designated as Endangered under the ESA and the SARA. There is suitable habitat present within the Study Area in the form of deciduous woodlands. They prefer to roost under loose bark in hollow trees. They typically hunt within forests, particularly below the canopy.
- **Tri-coloured Bat:** designated as Endangered under the ESA and the SARA. There is suitable habitat present within the Study Area in the form of deciduous woodlands. They prefer to roost under loose bark or in hollow trees. They typically hunt within forests, particularly below the canopy, and are known to be sparsely populated within their range.
- **Monarch**: designated as Special Concern under the ESA and the SARA. There is suitable habitat present within the Study Area in the form of meadows and open areas, including disturbed areas, where nectaring plants and especially Common Milkweed (*Asclepias syriatica*) is found which is their preferred foraging habitat.

3.5 Physical Environment

A brief overview of existing subsurface and hydrogeological condition was undertaken to support the Project. For the purposes of determining geotechnical and hydrogeological conditions, the Study Area is defined as the Project Limits plus a 100m buffer around them. The complete report is included in **Appendix B.** For areas east of Shefford Road, reports completed as part of Ottawa Road 174/Prescott-Russell County Road 17 EA Study were reviewed to supplement the information prepared specifically for this study.

3.5.1 Subsurface Conditions

Surficial geology in the Study Area consists of alluvial sand and silt deposits, glacial till plain, surficial bedrock and outcrops and silty clay is shown in **Figure 3-16**.

Bedrock Geology in the Study Area is shown in **Figure 3-17**. The bedrock throughout most of the Study Area consists of Billings Formation (shale), Lindsay Formation (limestone with dolostone beds), Bobcaygeon Formation (limestone) and Gull River formations (limestone with dolostone beds).

Mapping indicates that bedrock is fairly shallow throughout the Study Area (**Figure 3-18**). Depth to bedrock (drift thickness) varies from at surface for most of the Study Area to as deep as 100 m below ground surface between Ogilvie Road and Shefford Road.

Figure 3-16 Surficial Geology in the Study Area

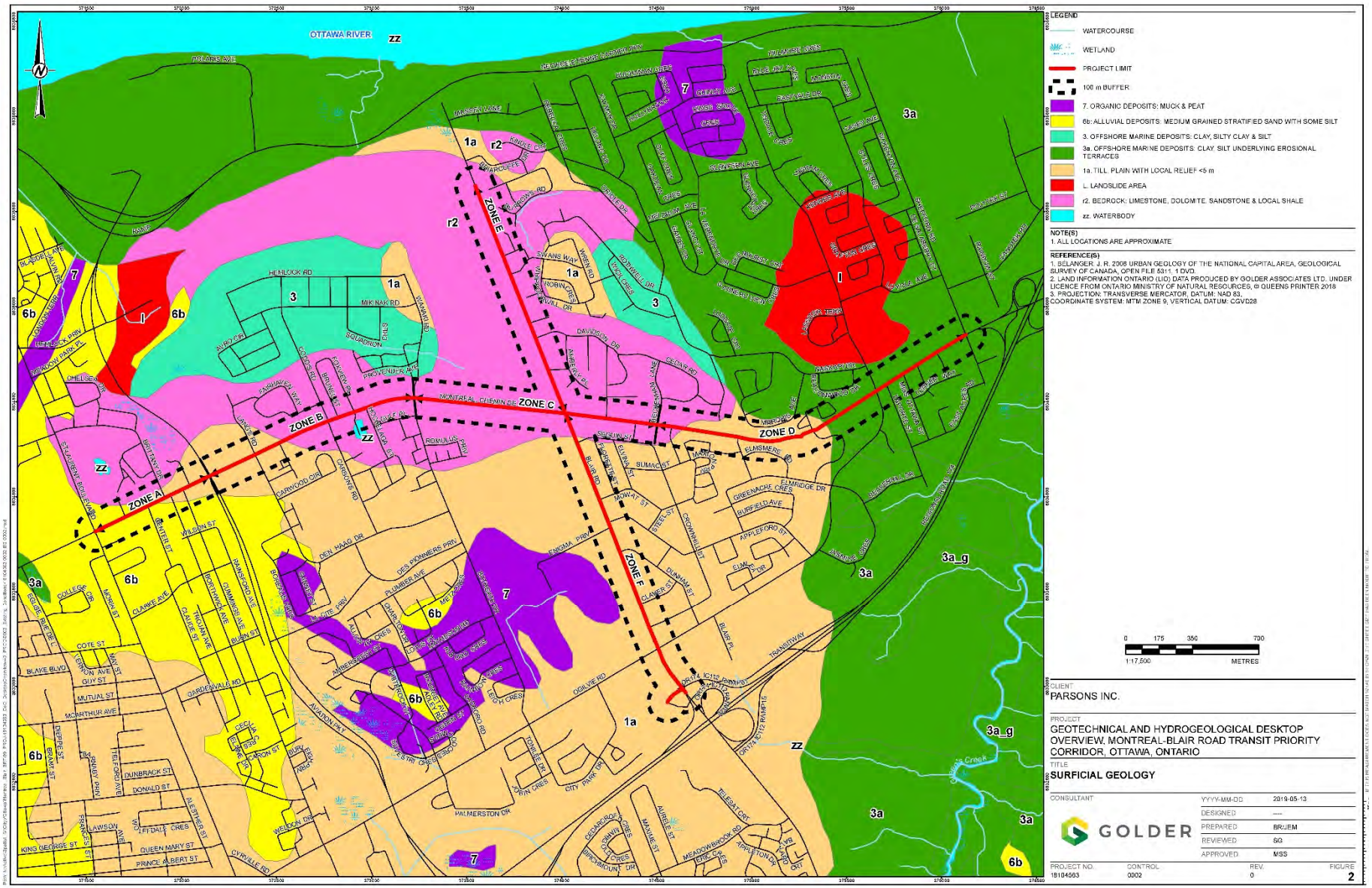


Figure 3-17 Bedrock Geology in the Study Area

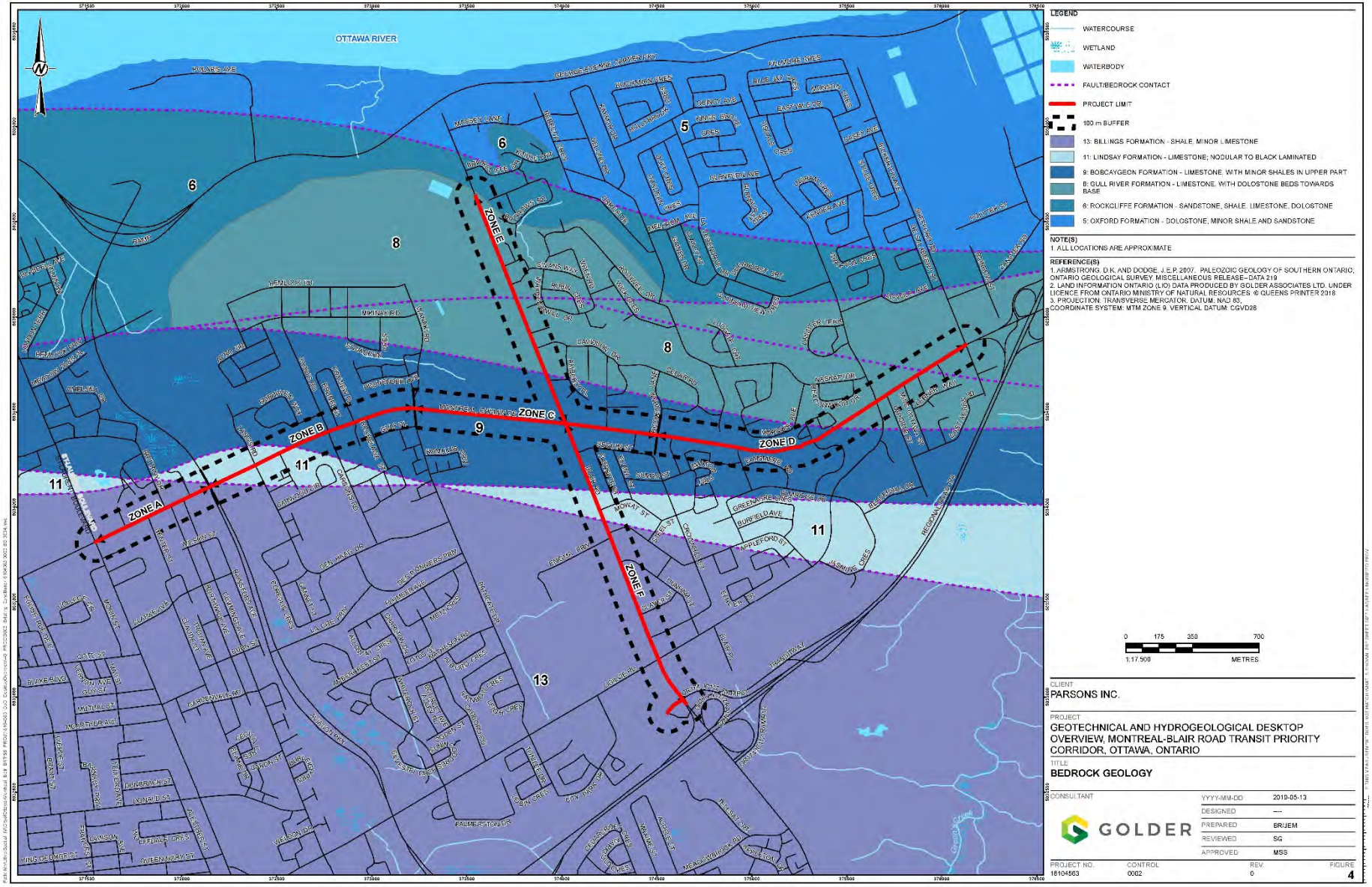
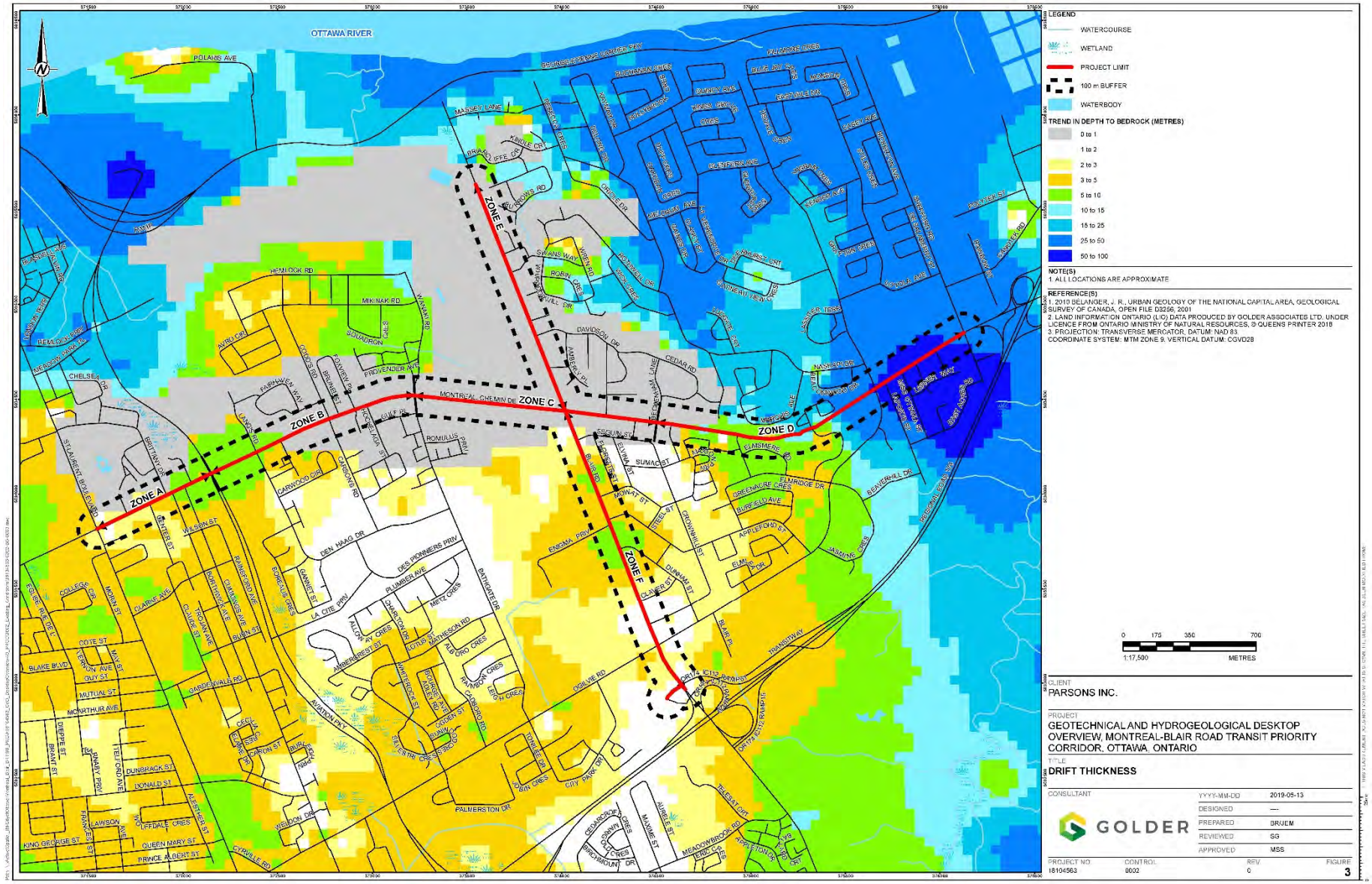


Figure 3-18 Drift Thickness in the Study Area



3.5.2 Hydrogeology

Previous investigations within the Study Area indicate that groundwater levels range anywhere from near ground surface to greater than 7 metres below ground surface. The water table was generally the deepest in the boreholes near Montreal Road between Aviation Parkway and Blair Road, while the water table was generally the shallowest in the boreholes near Blair Road to the south of Montreal Road.

The water table is most commonly found in the overburden but was also found in the bedrock subsurface layers. From the intersection of Aviation Parkway and Montreal Road west to St. Laurent Boulevard, the water table is generally found to lie in a sand deposit. The water table is located in the bedrock most often near Blair Road to the north of Montreal Road, which is also the area with the shallowest average depth to bedrock.

It should be noted that the data from the reviewed investigations took place over several decades and may not be representative of the current groundwater conditions given that factors such as infrastructure development can impact groundwater levels. Groundwater levels are also expected to fluctuate seasonally, and higher groundwater levels can be expected during wet periods of the year, such as spring.

3.5.2.1 Groundwater Supply Wells

There are 61 wells in the MECP Water Well Information System (WWIS) database that were completed as water supply wells within 100m of the Project Limits. Wells in the WWIS with a poor location accuracy greater than 300m were excluded. Within the Project Limits, 55 of the water supply wells are completed in bedrock and the remaining six wells are completed in the overburden.

The Fairhaven Community was incorporated in 1947 as one of the first cooperatives of single-family homes in the country and consists of about 25 houses situated between Lang's Road and Codd's Road just to the east of the Montfort Hospital and north of Montreal Road. The community consists of private water wells and septic systems, it is not connected to City water or sewer services, nor to the gas lines. This area is known for shallow karst bedrock and potential impacts from excavations in proximity to this area will need to be considered.

3.5.2.2 Overburden Aquifers

Based on information from the WWIS, there are six supply wells in the Study Area completed in the overburden, all of which are located in areas with thick clay deposits (eastern end of the Project Limits). The overburden wells were completed either in the clay (3) or in a gravel layer approximately 25 to 65 metres below ground surface and below the clay deposit (3). The wells completed in the gravel layer may indicate the presence of a confined gravel aquifer below the thick clay deposits. The gravel aquifer is likely of relatively limited extent as there are very few wells in the area that use it and its presence is not indicated in the well information of other wells in the area. The wells that were completed in clay do not contain any information on yield (no pumping test completed) and are not likely productive wells. Given the limited extent of the more highly transmissive deposits (sand and gravel), the principal water supply aquifer within the vicinity of the Project Limits is considered to be the underlying bedrock formations.

3.5.2.3 Bedrock Aquifers

The Billings Formation and Lindsay Formation are expected to have poor water yields due to the high percentage of shale. The Bobcaygeon and Gull River Formations are expected to provide marginally adequate to acceptable well yields for domestic consumption (less than 10 to 15 litres/minute) and are usually only exploited where better aquifers are too deep.

3.5.3 Sourcewater Protection Area

The *Clean Water Act*, 2006 provided the legislative framework for Source Protection in Ontario. The Project Limits fall within the Rideau Valley Source Protection Area, as described in the Mississippi-Rideau Source Protection Plan, effective January 1, 2015. The Mississippi-Rideau Source Protection Region is 8,500 square kilometers and is made up of the jurisdictions of the Mississippi Valley and Rideau Valley Conservation Authorities. Source protection plans exist to protect drinking water across municipal boundaries. The Source Protection plan identifies four vulnerable areas: Wellhead

Protection Areas, Intake Protection Zones, Highly Vulnerable Aquifers, and Significant Groundwater Recharge Areas. The Project Limits were examined for existence of these areas.

3.5.3.1 Intake Protection Zone

Intake Protection Zones (IPZ) identify areas with sensitive surface water infiltration areas. Areas with an IPZ of 1 or 2 are much more sensitive and means that contaminants could reach a drinking water intake pipe at the water treatment plant within, or less than two hours. The Project Limits are not located in an area identified as an IPZ.

3.5.3.2 Wellhead Protection Area

The Project Limits are not located in a Wellhead Protection Zone.

3.5.3.3 Groundwater Recharge and Vulnerable Aquifers

The Project Limits are not located in a Significant Groundwater Recharge Area. The Project Limits contain Highly Vulnerable Aquifers, which are more vulnerable to surface contaminants. Most of the Mississippi-Rideau region contains aquifers of similar vulnerability. No policies apply within Significant Groundwater Recharge Areas or Highly Vulnerable Aquifers.

3.5.4 Contamination and Hazardous Materials

A Limited Phase I Environmental Site Assessment (ESA) was completed to support the Project. For the purposes of determining areas of potential environmental concern, the Study Area is defined as the Project Limits plus a 250m buffer around them. This distance is defined by the requirement outlined in Ontario Regulation 153/04, Records of Site Condition – Part XV.1 of the *Environmental Protection Act*. The complete report is included in **Appendix B.** The information was supplemented with reports prepared for the Ottawa Road 174/Prescott-Russell Country Road 17 Environmental Assessment Study.

The primary objective of ESA is to identify, based on readily available information and without intrusive investigation, actual or potential issues of environmental concern which have the potential to impact the soil and/or groundwater within the Study Area related to former activities within the Study Area and to identify the need for further ESA activities (i.e., Phase II ESA). The ESA consisted of the following items with respect to the Study Area:

- A review of aerial photographs;
- A site visit;
- A review of topographic, geologic and hydrogeologic maps or reports; and
- A review of the Environmental Risk Information Service (ERIS) Database Report.

Based on the information obtained, 100 properties within the Study Area contain potential environmental concern and are illustrated on **Figure 3-19**, **Figure 3-20**, **Figure 3-21**, **Figure 3-22** and **Figure 3-23**.

Figure 3-19 Areas of Potential Environmental Concern within the Study Area-West

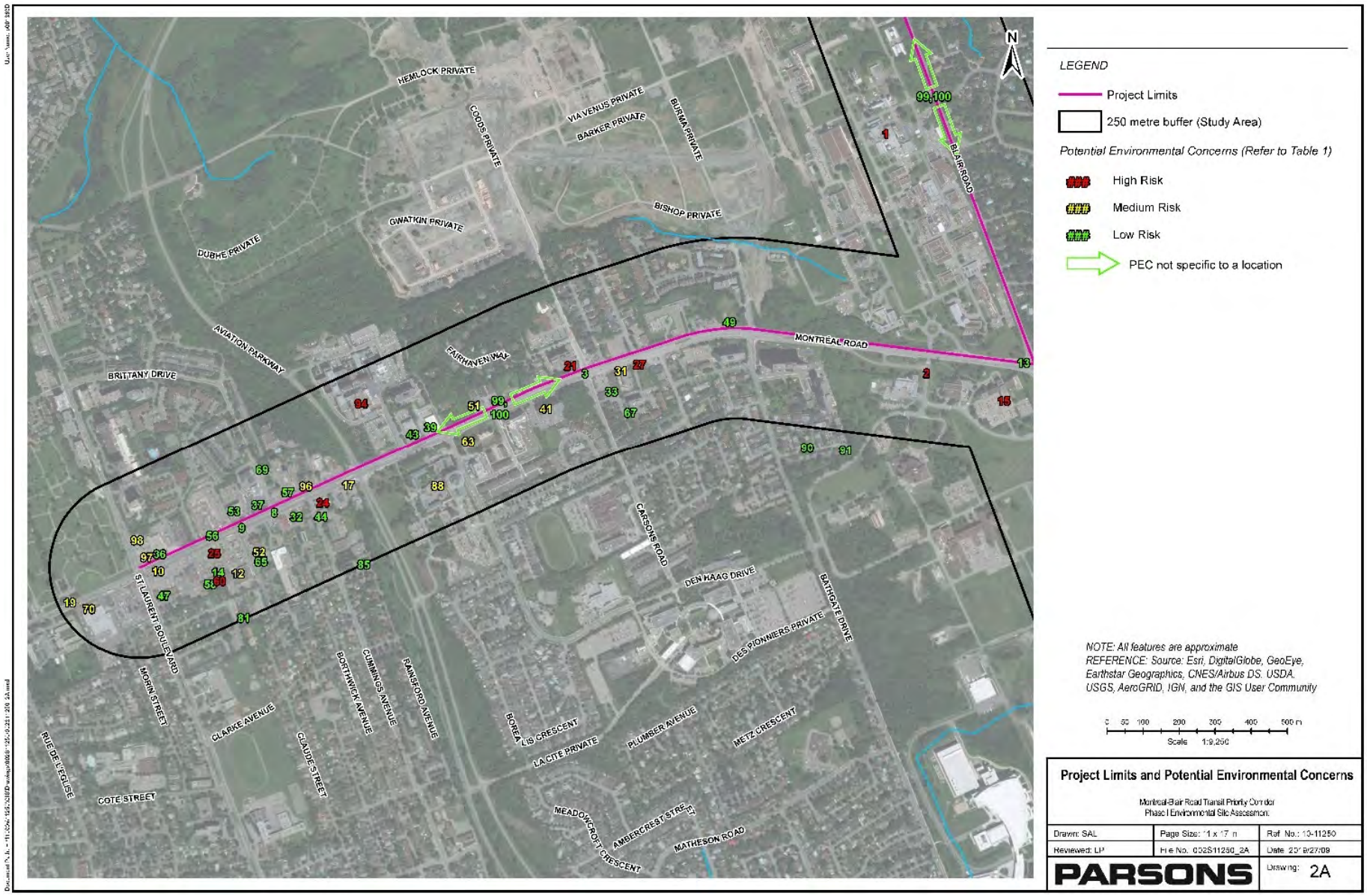


Figure 3-20 Areas of Potential Environmental Concern within the Study Area - East

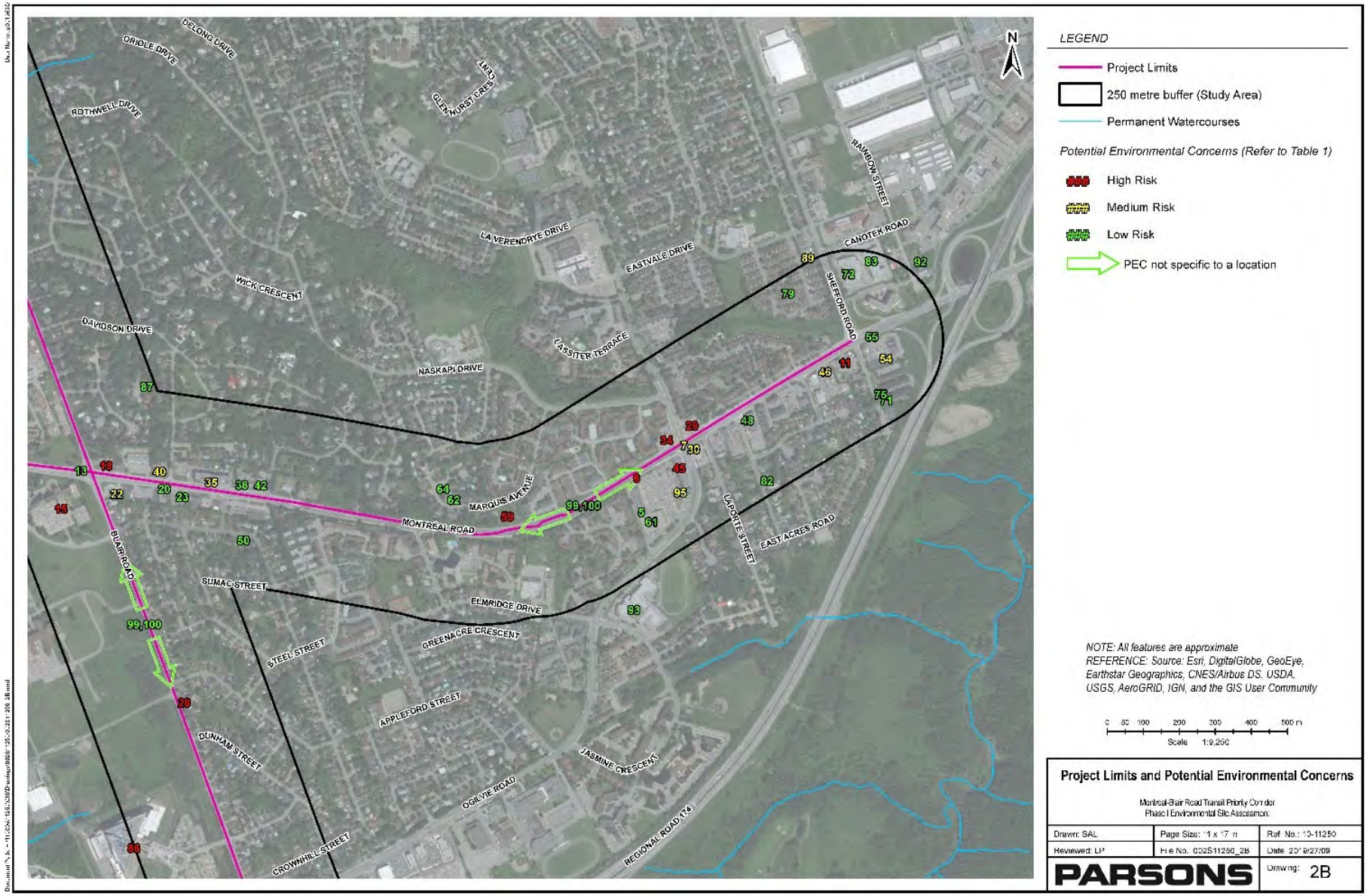


Figure 3-21 Areas of Potential Environmental Concern within the Study Area - Alternative Bus Loop Sites

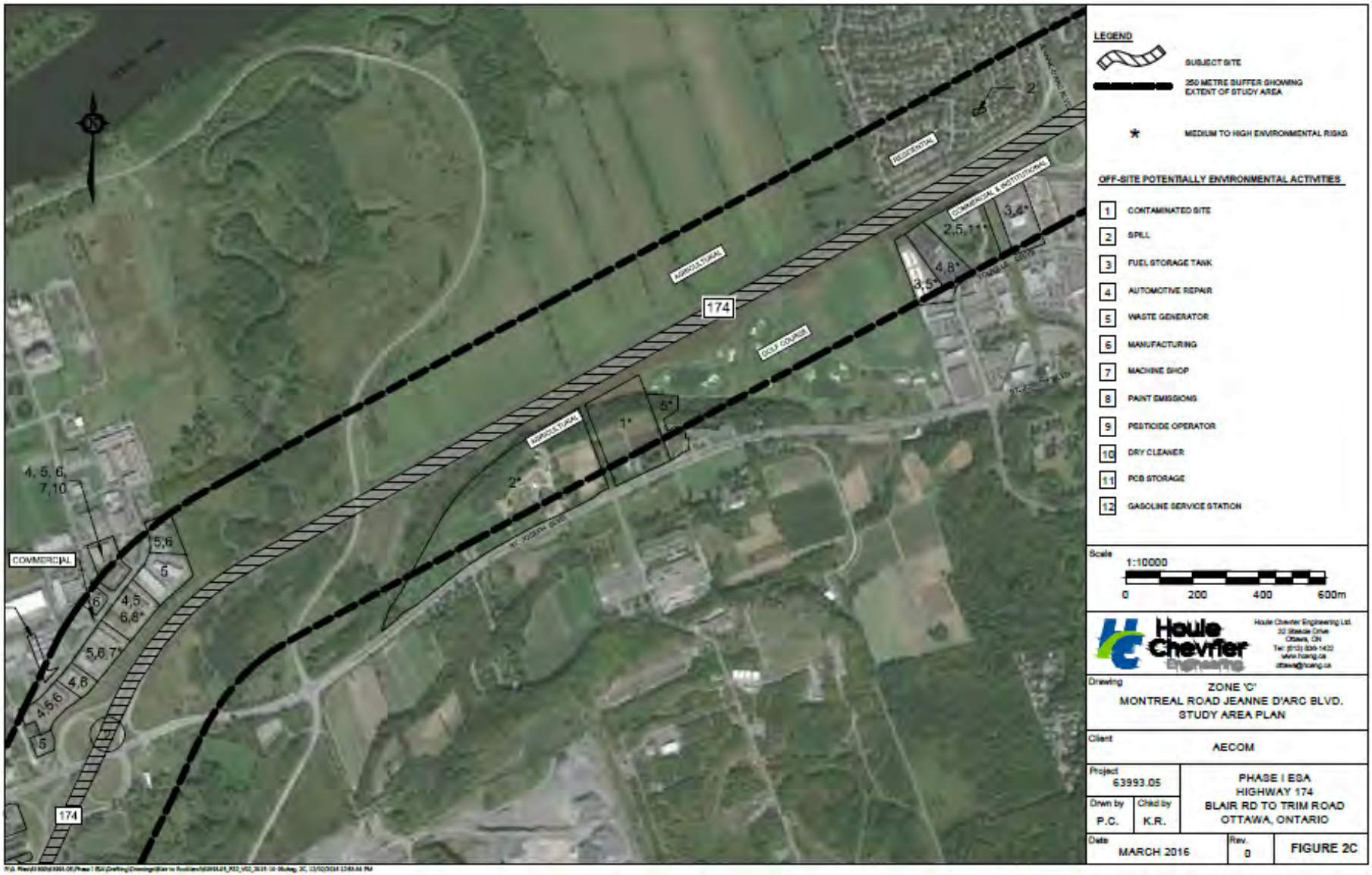


Figure 3-22 Areas of Potential Environmental Concern within the Study Area - North

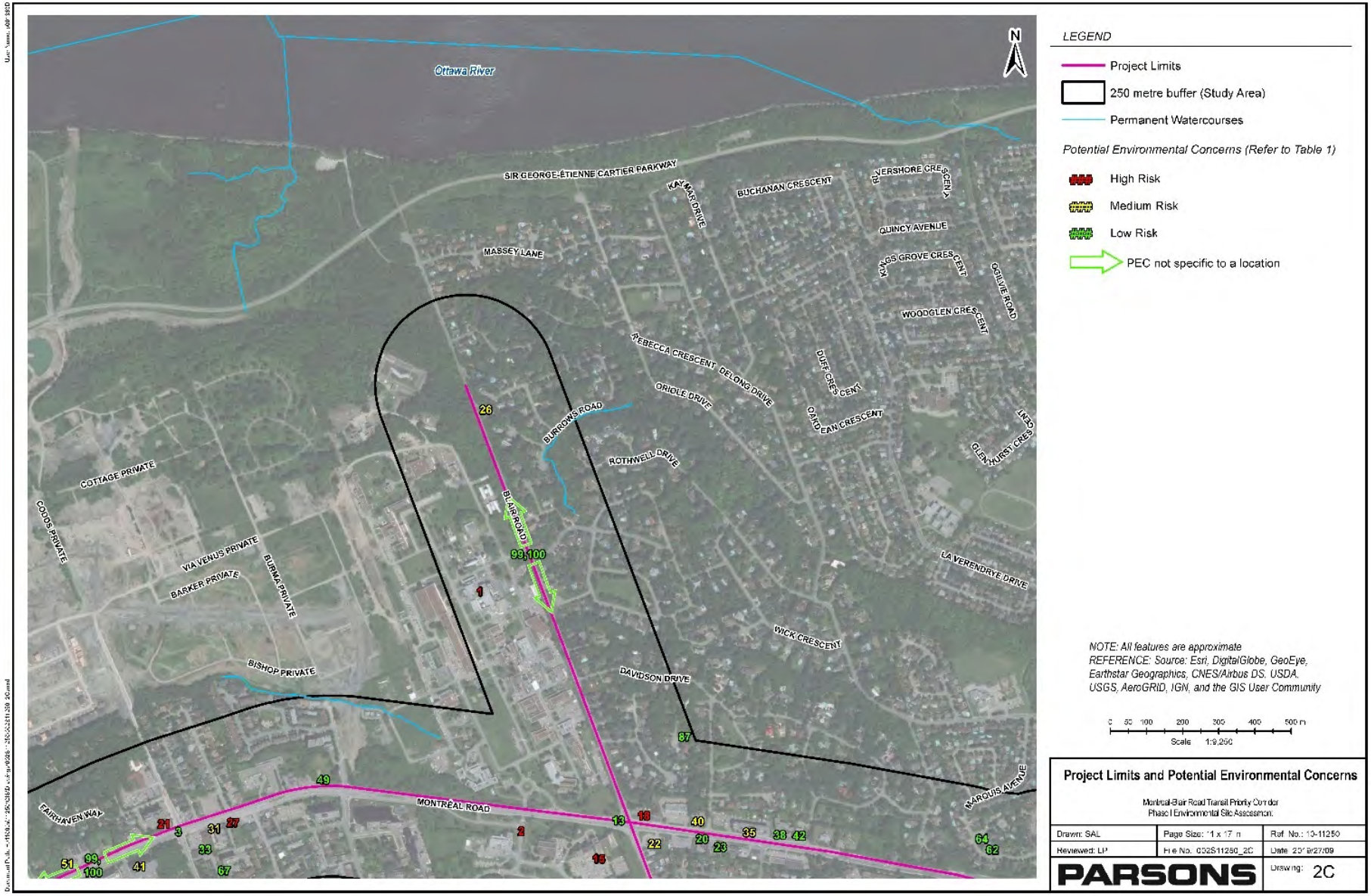
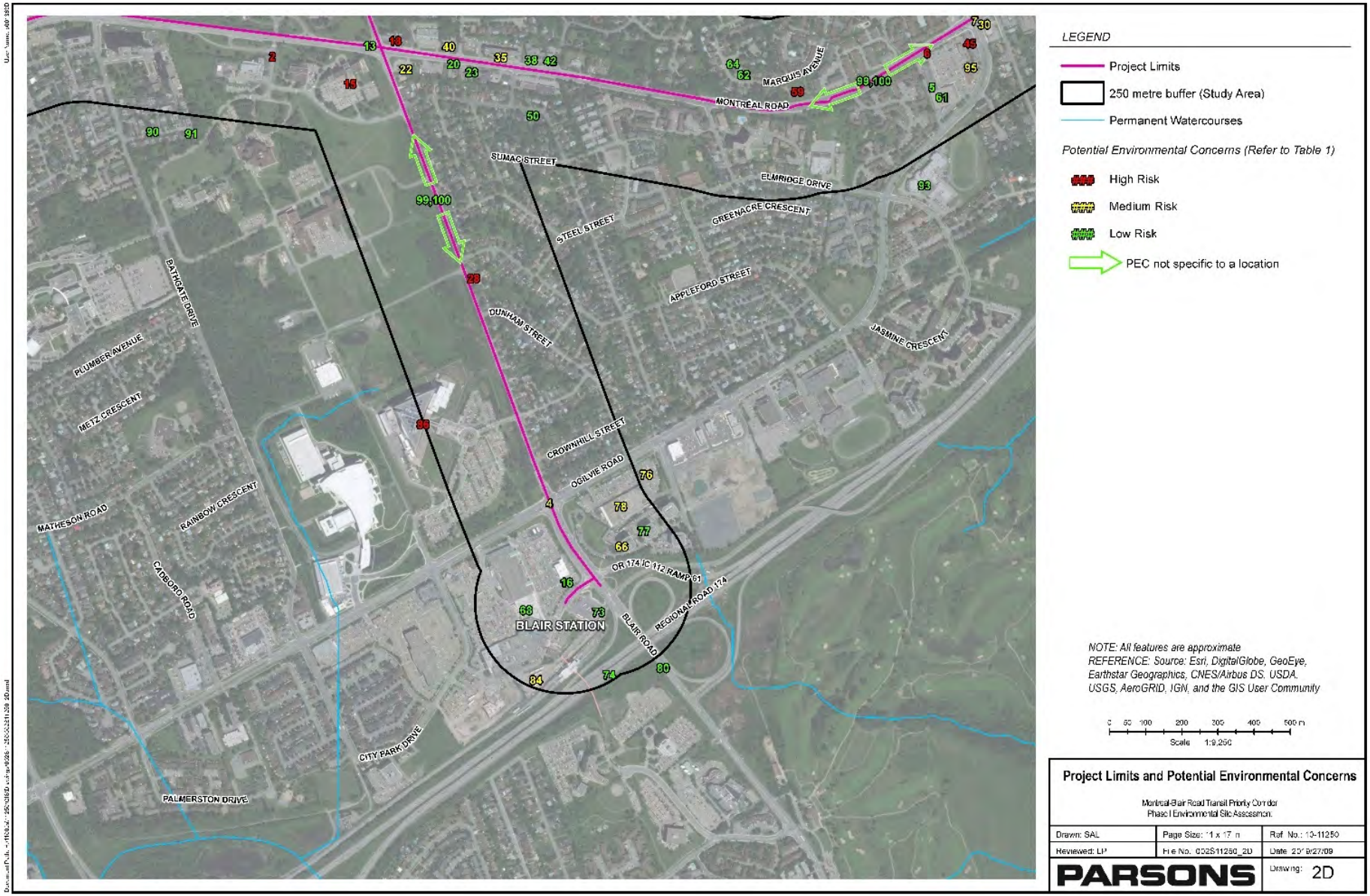


Figure 3-23 Areas of Potential Environmental Concern within the Study Area - South



3.5.5 Infrastructure and Utilities

This section identifies existing infrastructure and utilities within the Project Limits.

The documents reviewed to inform this section include the City of Ottawa *Utility Coordinating Committee drawings* (UCC), GeoOttawa web mapping, and the 2013 *Infrastructure Master Plan* (City of Ottawa, 2013) and the City of Ottawa Construction-and-Infrastructure-Interactive map.

3.5.5.1 Water Distribution Network

3.5.5.1.1 Existing Water Distribution Network

The City of Ottawa municipal water distribution network fully services the area within the Project Limits. The distribution network includes backbone watermains, feedermains, distribution mains, valves, valve chambers and hydrants. The network also includes a high pressure main and a low pressure main on Montreal Road. 406mm watermain materials include ductile iron (DI), unlined cast iron (UCI), Concrete (CONC), asbestos concrete (AC), extra strength concrete (CONX), reinforced concrete (CONR), and polyvinyl chloride (PVC). The watermains range in size from 152mm diameter to 914mm diameter and were installed between 1952 and 2014. Only watermains 400mm diameter and larger are detailed in **Table 3-7** and **Table 3-8** and shown in **Figure 3-24.**

The Project Limits are within pressure zones "1E" and "MONT". The "MONT" pressure zone is supplied by two pumping stations. The first one is located at 565 Brittany Drive, 70m north of Montreal Road. The second one is located at 989 Montreal Road near the Blair Road intersection.

Table 3-7 East-West Running Watermains

Montreal Road	Diameter (mm)	Material	Year Installed
22m west of St. Laurent Blvd. to St. Laurent Blvd	406	--	--
St. Laurent Blvd. to 12m west of Brittany Dr.	406	UCI	1952
12m west of Brittany Dr. to Lang's Rd.	406	PVC	2005
Brittany Dr. to Burma Rd.	406	PVC	2004/2005/2006
28m west of Burma Rd. to Burma Rd.	610	C301	2003
Ogilvie Rd. to 235m east of Shefford Rd.	914	C301	2014
Highway 417 Off Ramp to eastern limit of study	1220	C301	1972

Blair Road	Diameter (mm)	Material	Year Installed
Ogilvie Road	610	C301	1966

Table 3-8 North-South Running Watermains

Montreal Road	Diameter (mm)	Material	Year Installed
St. Laurent Blvd.	406	DI	1961/1971
St. Laurent Blvd.	406	DI	1961
Brittany Dr.	406	PVC	2005
Codd's Rd.	406	PVC	2016
17m east of Burma Rd.	406	C301	2004
25m west of Burma Rd.	610	C301	2003
Burma Rd.	406	PVC	2004
Ogilvie Rd.	406	CI	1966
45m west Shefford Rd.	610	C301	2014
Shefford Rd.	406	DI	1972

Blair Road	Diameter (mm)	Material	Year Installed
Ogilvie Rd.	610	C301	1966

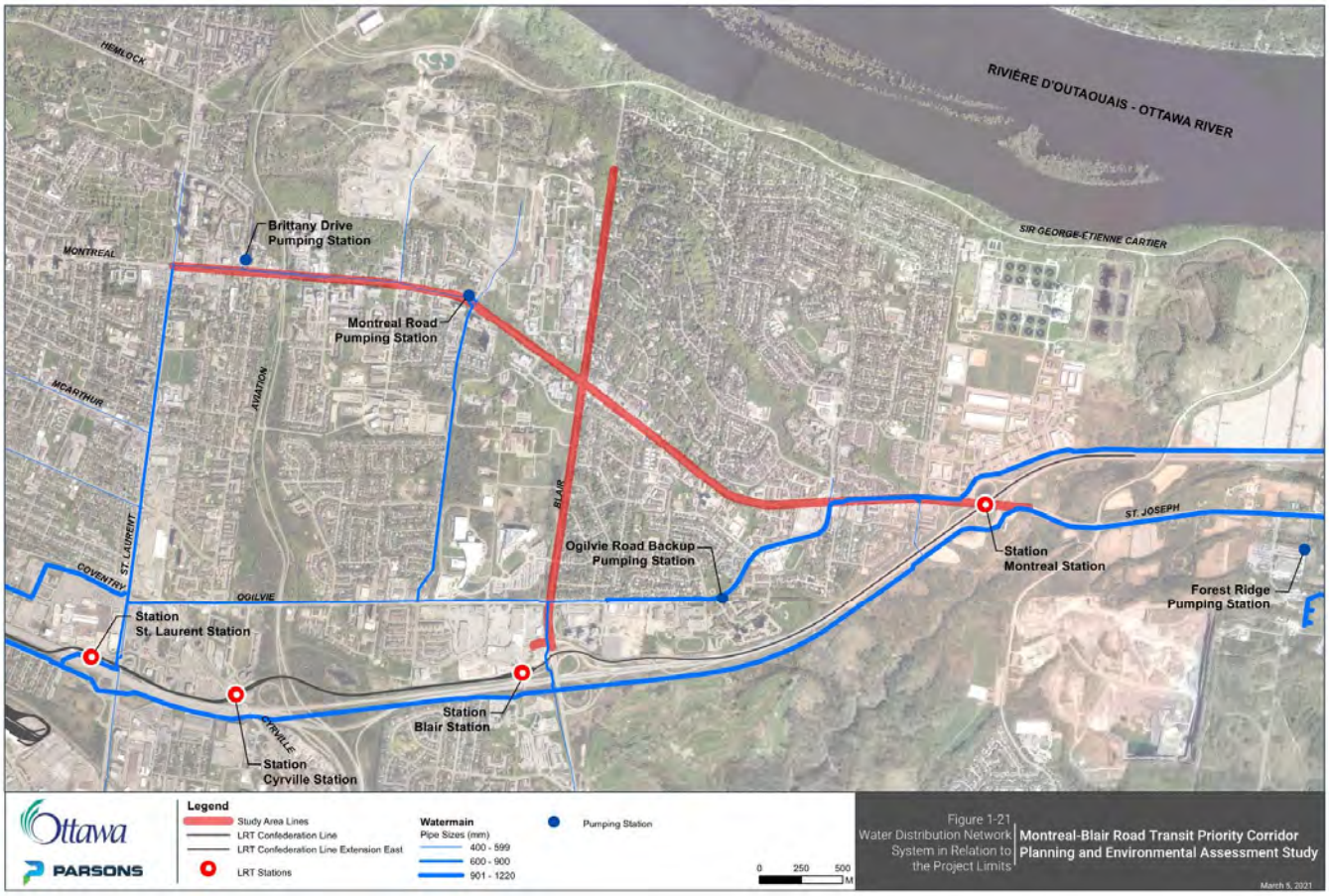
3.5.5.1.2 Future Water Distribution Projects

The City of Ottawa has scheduled the following works in the near future:

- renewal of a 914mm diameter watermain located on the north side of Montreal Road between Shefford Road and the eastern limit of the study. This project is scheduled to be started this year (2021), and,
- renewal of a 1220mm diameter watermain located on the south side of Montreal Road from 120m east of OR 174 overpass to the eastern limit of the study. This project is scheduled to be started between 2022 and 2023.

The 2013 IMP identifies one growth-related project in the Project Limits. The project will involve the installation of a watermain to link the 914mm diameter watermain, located on the north side of Montreal Road and Shefford Road, to an existing transmission main located to the south of the Montreal Road. The construction is not currently scheduled.

Figure 3-24 Water Distribution Network in Relation to the Project Limits



3.5.5.2 Wastewater Collection System

3.5.5.2.1 Existing Wastewater Collection System

The City of Ottawa municipal sanitary collection system fully services the area within the Project Limits. The wastewater collection system includes collectors/trunks, local sanitary sewers, a private combined forcemain and maintenance holes. The private 300mm diameter combined forcemain, owned by the NRC, crosses Montreal Road between Bathgate Drive and Blair Road. Sewer materials include concrete (CONC), asbestos concrete (AC), extra strength concrete (CONX), reinforced concrete (CONR), and polyvinyl chloride (PVC). The sewers range in size from 200mm to 3000mm and were installed between 1953 and 2010. Only sewers 450mm diameter and larger are detailed in **Table 3-9** and shown in **Figure 3-25.**

Table 3-9 North-South Running Sanitary Sewers

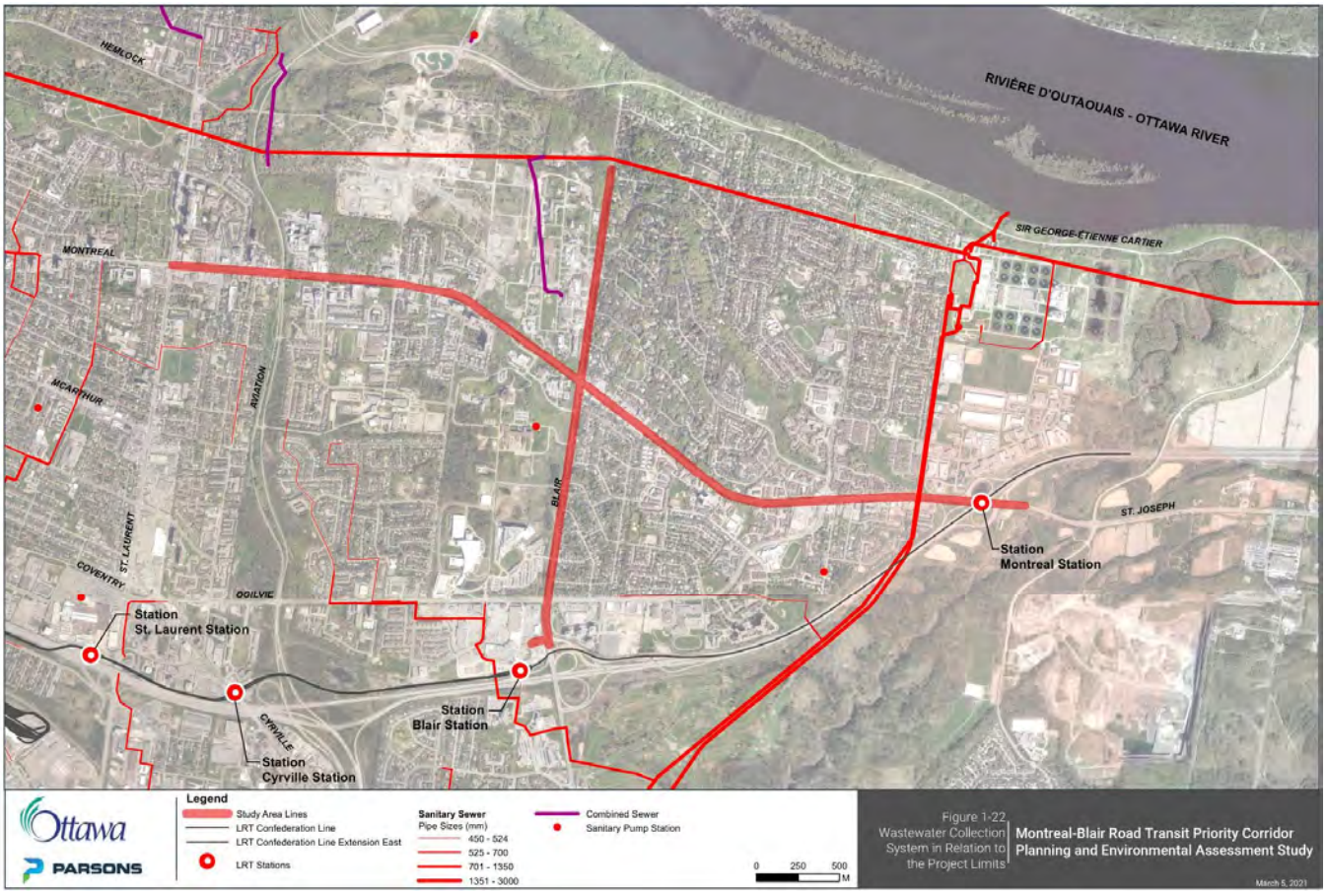
Montreal Road	Diameter (mm)	Material	Year Installed
Shefford Rd.	1650	CONR	1963
Shefford Rd.	3000	CONR	1995
317m west of Blair Rd. (NRC combined forcemain)	300	--	1962

3.5.5.2.2 Future Wastewater Collection Projects

The City of Ottawa has indicated the following works that are scheduled in the near future:

- 83 m of sanitary sewer on Montreal Road between Center Street and Brittany Drive, scheduled for trenchless sewer lining this year (2021);
- 270m of sanitary sewer on Montreal Road between Center Street and Brittany Drive, scheduled for trenchless sewer lining in 2019; and
- 220m of sanitary sewer on Brittany Drive from Montreal Road to the first maintenance hole north of Montreal Road, adjacent to the Brittany Drive Pumping Station, scheduled to be reconstructed in 2020 in conjunction with the Brittany Drive Pumping Station upgrades.

Figure 3-25 Wastewater Collection System in Relation to the Project Limits



3.5.5.3 Stormwater Collection System

3.5.5.3.1 Existing Stormwater Collection System

The City of Ottawa municipal stormwater collection system fully services the area within the Project Limits. The stormwater collection system includes collectors/trunks, local storm sewers, catch basins, maintenance holes and culverts. Sewer materials include concrete (CONC), reinforced concrete (CONR), polyvinyl chloride (PVC) and corrugated steel (CSP). The sewers range in size from 225mm to 1200mm and were installed between 1960 and 2010. Only sewers 600mm diameter and larger are detailed in **Table 3-10** and **Table 3-11** and shown in **Figure 3-26**.

Runoff generated along Montreal Road ultimately drains into the Ottawa River via a sewer network, although some flow is diverted into stormwater management (SWM) ponds located near the intersection of Highway 417 and OR 174. Much runoff generated along Blair Road also drains into these SWM ponds, however, some stormwater is diverted into a sewer system that discharges into a tributary of Green's Creek at the intersection of OR 174 and Blair Road.

Table 3-10 East-West Running Stormwater Sewers

Montreal Road	Diameter (mm)	Material	Year Installed
Western limit of study to St. Laurent Blvd.	750	CONR	1972
St. Laurent Blvd. to 8m east of Hillside Dr.	675	CONR	1966
Cummings Ave. to 110m west of Lang's Rd.	750	CONC	1978
110m west of Lang's Rd. to Lang's Rd.	675	CONC	--
30m to 70m east of Brunel St.	600	CONR	1975
Blair Rd. to Clovelly Rd.	600	CONR	1971
100m west of Foxborough Priv. to Ogilvie Rd.	750	CONR	1972
Foxborough Priv. to Ogilvie Rd	600	CONC	1980/1986
150m east of Foxborough Priv. to 25m west of Ogilvie Rd.	600/675	CONR	1980
15m to 160m east of Shefford Rd.	600	CONX	1980

Blair Road	Diameter (mm)	Material	Year Installed
140m south of Dunham St.	1050	CSP	1996

Table 3-11 North-South Running Stormwater Sewers

Montreal Road	Diameter (mm)	Material	Year Installed
St. Laurent Blvd	675	CONC	1977
Cummings Ave.	900	CSP	1995
Codd's Rd.	600	CONC	1973
Blair Rd.	600	CONR	1972
100m west of Foxborough Priv.	750	CONR	1973

Blair Road	Diameter (mm)	Material	Year Installed
Montreal Rd. to Crownhill St.	600 to 1200	CONR	1964

3.5.5.3.2 Future Stormwater/Drainage Projects

The City of Ottawa has identified several culverts near Blair Station but outside the Project Limits will be replaced in 2021. These culverts are shown on **Figure 3-26** below.

The 2013 IMP does not identify specific growth-related stormwater projects in the Project Limits.

Figure 3-26 Future Stormwater Works near Blair Station

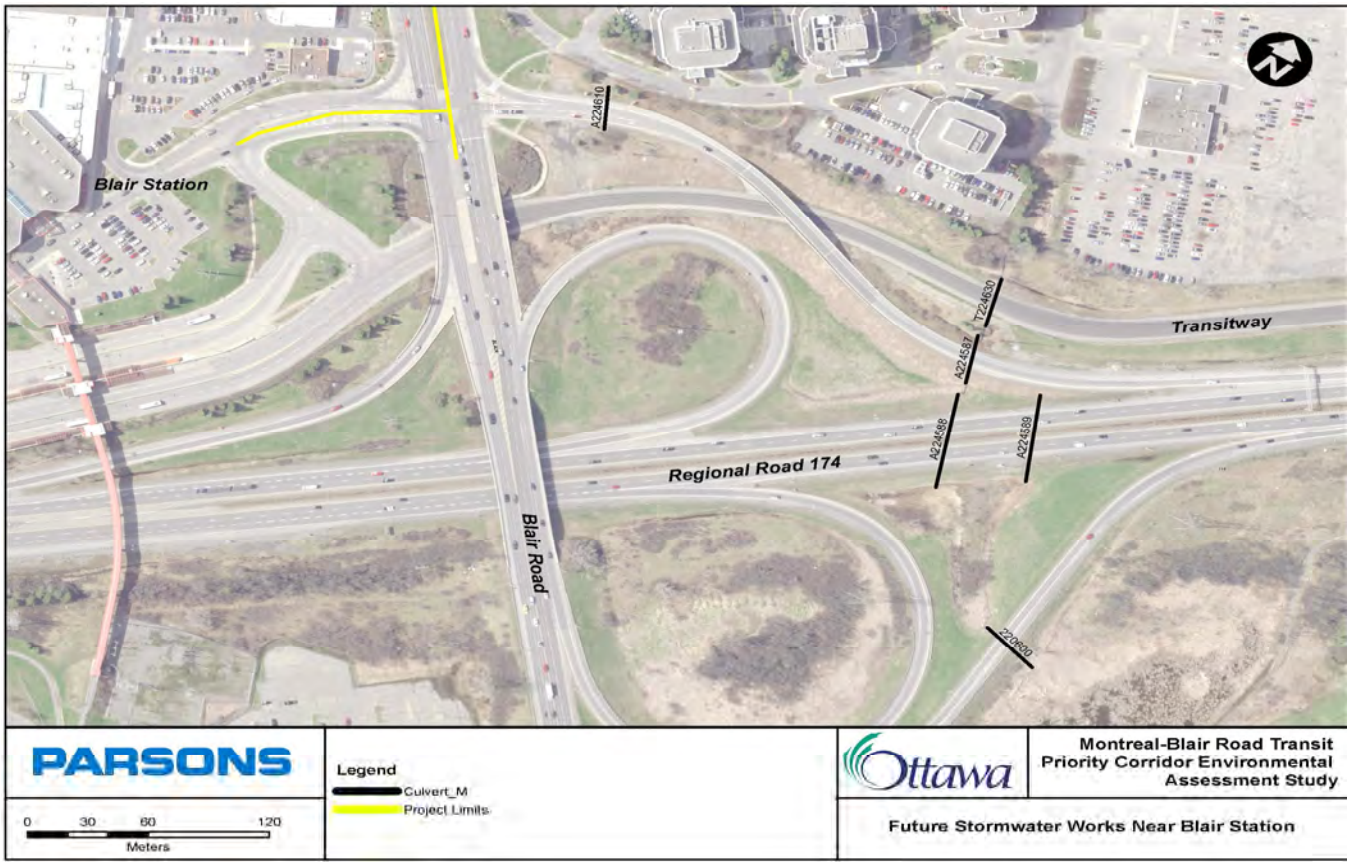
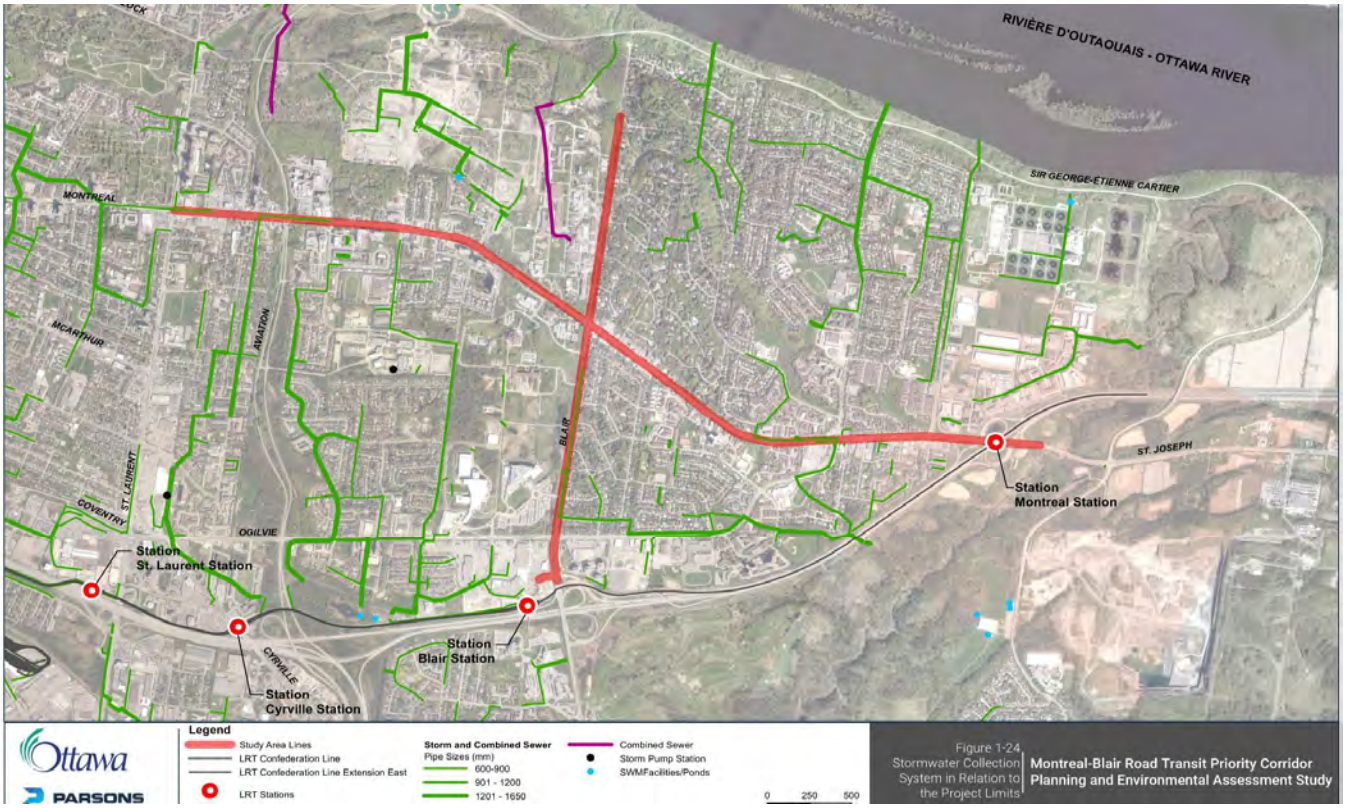


Figure 3-27 Stormwater Wastewater Collection System in Relation to the Project Limits



3.5.5.4 Gas Distribution

Enbridge Gas distributes natural gas through gas mains within the Project Limits. The gas mains range in sizes from 35mm to 300mm diameter. The 300mm diameter gas main runs north-south and east-west at Montreal Road and St. Laurent Boulevard intersection. That gas main is identified as “vital”. Vital gas mains are critical to the gas distribution system. They are typically more costly to relocate due to their size and operating pressure. Gas mains are detailed in

Table 3-12 East-West Running Gas Mains

Montreal Road	Side of Road	Diameter (mm)	Type
west of St. Laurent Blvd. to 55m east of Hillside Dr.	north	150	--
St. Laurent Blvd.	south	300	vital
Burma Rd. to 110m east of Clovelly Rd.	north	200	--
150m east of Beckenham Ln. to 45m west of Ogilvie Rd.	north	200	--
45m west of Ogilvie rd. to Ogilvie Rd.	north	100	--
Ogilvie Rd. to Shefford Rd.	north	50	--
St. Laurent Blvd. to 120m east of St. Laurent Blvd.	south	200	--
55m east of Hillside Rd. to 65m west of Codd's Rd.	south	200	--
65m west of Codd's Rd. to Burma Rd.	south	200	--
110m east of Clovelly Rd. to 150m east of Beckenham Ln.	south	200	--
250m east of OR 174 overpass to eastern limit of study	south	150	--

Blair Road	Side of Road	Diameter (mm)	Type
Swans Way S	south	35	--
Davidson Dr.	north	35	--
Nicol St.	south	50	--
Montreal Rd.	north	200	--
Seguin St.	north	35	--
Appleford St.	north	35	--
Dunham St.	north	35	--
Claver St.	south	35	--
Crownhill St.	south	50	--
Ogilvie Rd.	north	150	--
155m south of Ogilvie Rd.	--	200	--

Table 3-13 North-South Running Gas Mains

Montreal Road	Side of Road	Diameter (mm)	Type
St. Laurent Blvd.	east	300	vital
115m east of St. Laurent Blvd.	--	150	--
235m east of St. Laurent Blvd.	--	150	--
Hillside Rd.	west	35	--
Brittany Dr.	west	35	--
Cummings Ave.	west	--	--
Thomson St.	west	35	--
150m east of Aviation Pkwy	--	100	--
Lang's Rd.	east	50	--
Den Haag Dr.	east	100	--
30m east of LeBoutillier Ave.	--	35	--
65m west of Codd's Rd.	--	200	--
Codd's Rd.	west	35	--
Codd's Rd.	east	150	--
Brunel St.	east	50	--
Burma Rd.	east	200	--
Burma Rd.	east	150	--
Bathgate Dr.	east	100	--
MacCallum St.	east	200	--
40m east of MacCallum St.	--	200	--
Blair Rd.	east	50	--

Montreal Road	Side of Road	Diameter (mm)	Type
Clovelly Rd.	east	50	--
110m east of Clovelly Rd.	--	200	--
150m east of Beckenham Ln.	--	200	--
100m west of Elmsmere Rd.	--	100	--
Ogilvie Rd.	west	100	--
Miss Ottawa St.	east	50	--
Sinclair St.	east	50	--
45m east of Sinclair St.	--	35	--
Shefford Rd.	east	50	--
250m east of OR 174 overpass	--	150	--

Blair Road	Side of Road	Diameter (mm)	Type
Northern limit of study to 315m north of Swans Way N	--	35	--
Swans Way S to 90m south of Swans Way S	east	35	--
35m north of Fairview Ln. to 50m north of Nicol St.	east	35	--
Nicol St. to Montreal Rd.	east	50	--
70m from Montreal Rd. to 15m north of Mowat St.	east	35	--
30m south of Mowat St. to Appleford St.	east	35	--
15m south of Appleford St. to Dunham St.	east	35	--
15m south of Dunham St. to Claver St.	east	35	--
Claver St. to 55m south of Crownhill St.	east	50	--
Ogilvie Rd. to 155m south of Ogilvie Rd.	west	200	--
155m south of Ogilvie Rd. to southern limit of study	east	200	--

3.5.5.5 Electricity Distribution

Hydro Ottawa network distributes electricity within the Project Limits through using a combination of underground duct banks, individual conduits, buried cables and overhead on poles. The duct banks in the Project Limits vary in size from 400mm to 1232mm wide. Duct banks are located at the St. Laurent Boulevard and Montreal Road intersection. On Montreal Road, the duct banks are located on both sides of the road from St. Laurent Boulevard up to 100m east of Codd's Road. From Codd's Road, the duct banks are located on the north side to Foxview Place. Other duct banks are located at Montreal Road and Bathgate Drive intersection. Blair Road is serviced by overhead cables on poles. Two 680mm wide duct banks cross Blair Road between Ogilvie Road and Blair Station.

A Hydro One high voltage power line on pylons is located parallel to OR 174, on the south side of the road as well as a 115-kilovolt transmission line on the west side of Blair Road.

3.5.5.6 Telecommunications Distribution Systems

Telecommunications services within the Project Limits are provided by Bell, Rogers, Atria, Telecom Ottawa, Telus and Allstream. These services are distributed through underground duct banks, conduits, cables, and overhead on poles.

4.0 EVALUATION OF ALTERNATIVE SOLUTIONS

Environmental assessment (EA) processes recognize that there may be various alternatives or options to solve a need or opportunity and require that proponents explore all reasonable solutions. Alternative planning solutions are functionally different ways of addressing a need or opportunity. As part of this EA process, alternative solutions were considered at the project level versus at a City network level as provided in the Transportation Master Plan (TMP).

The goal of the TMP is to develop a sustainable transportation network for the current planning period (to the year 2031) that meets the needs of residents and businesses in a cost-effective manner. The alternative planning solutions considered for this EA study were developed and evaluated recognizing that the 2013 TMP preferred solution for the Montreal-Blair Road corridors was to provide transit priority measures in some manner as listed in the Transit Priority Projects. These are listed below in **Table 4-1**.

Table 4-1 Montreal-Blair Road Transit Priority Projects as per 2013 TMP

Project (TMP Schedule)	General Description	Rationale
Blair Road (Affordable Network and Network Concept)	Exclusive bus lanes and transit signal priority between Blair LRT Station ("Blair Station") and Montreal Road. Bus lanes to be a combination of road widening (north of Ogilvie Road) and conversion of existing traffic lanes (south of Ogilvie Road)	Improves transit service between the eastern suburbs and Vanier
Montreal Road (Affordable Network)	Road widening to provide exclusive bus lanes and transit signal priority between St. Laurent Boulevard and Blair Road	Reduces travel time and improves reliability of bus service and accommodates future development at former CFB Rockcliffe
Montreal Road (Network Concept)	Road widening to provide exclusive bus lanes and transit signal priority between Blair Road and Ogilvie Road	Reduces travel time and improves reliability of bus service and accommodates future development at former CFB Rockcliffe

During the Study, Blair Road north of Montreal Road was added to the northern project limits for consideration in the EA. The decision to add this section of Blair Road was made by City Council when approving the Scope of Work for this EA study in May 2018. The goal is to investigate the feasibility of transit, cycling and pedestrian connection(s) from Wateridge Village across the National Research Council (NRC) campus to Montreal or Blair Road, as identified in the Former CFB Rockcliffe Community Design Plan (2015). Further, the eastern project limits of the EA study on Montreal Road were also extended to Shefford Road (not to Ogilvie Road as per the TMP) as it was determined that it better provides consideration for tying in the transit priority corridor to the future Montreal LRT Station ("Montreal Station"), which will be built as part of Stage 2 LRT Confederation Line.

The TMP analyzed projected weekday morning peak-period transportation demand for the year 2031. This analysis indicated that measures to enhance non-automobile mode shares would most effectively meet the overall transportation needs, reduce long-term operating costs, and support the City's growth management targets supporting intensification. The City developed a 2031 Network Concept that includes the supporting infrastructure to achieve the City's targets for travel mode shares for pedestrians and cyclists, transit and automobile drivers/passengers and level of service for roads and transit. For the Montreal-Blair Road corridors the identified transit project was to provide exclusive bus lanes primarily through road widening. It was anticipated at that time, that additional right-of-way (ROW) requirements would be needed to implement the project as a complete street which would also include enhancements to the pedestrian and cycling environment.

In 2015, Council approved a Complete Streets Framework, which requires a look at all modes when projects are initiated. Complete Streets incorporate the physical elements that allow a street to offer safety, comfort and mobility for all users of the street regardless of their age, ability, or mode of transportation. A Complete Streets approach uses every transportation project as a catalyst for improvements within the scope of the project to enable safe, comfortable barrier-free access for all users.

With the TMP analysis as a starting point, and based on an overview of relevant existing conditions in the study area, planning policy directions for growth as outlined in the City's Official Plan and supporting Secondary Plans, as well as a general need an opportunity to reconstruct Montreal Road and Blair Road as a Complete Street, a range of alternative

solutions were developed and evaluated for the Montreal and Blair Road Corridors as well as the possibility of providing an active transportation and transit link across the NRC campus.

4.1 Planning Objectives

As presented in the 2013 Transportation Master Plan, *"Ottawa's Transportation system [in 2031] will enhance our quality of life by supporting social, environmental, and economic sustainability in an accountable and responsive manner."* This vision for transportation in the City is supported by a number of elements and principles that provide a basis for developing and evaluating alternatives as part of this Study. Some of these themes, as they apply to the Montreal-Blair Road Transit Priority Corridors include:

1. Support a reduction in automobile dependence
2. Support a multi-modal system for all ages and abilities
3. Support adjacent land uses and future intensification
4. Sensitive to the natural environment
5. Enhance the Economy
6. Deliver cost-effective services
7. Provide a system that is adaptable and resilient to climate change

4.2 Alternative Solutions

There are three distinct aspects of the study that require a review of alternative solutions. These include the:

1. Montreal Road Corridor
2. Blair Road Corridor
3. Wateridge Village/NRC Transit and Active Transportation Link

A range of alternative solutions were developed for the road corridors and the transit and active transportation link separately that have some potential to address the above-noted planning objectives. The alternative solutions are described in Table 4-2 and Table 4-3.

Table 4-2 List of Alternative Solutions – Montreal and Blair Road Corridors

	Alternative Solution	Description
1	Do Nothing	Used as a baseline for comparison, includes regular on-going maintenance of the corridor in its present configuration but does not include modifications or enhancements to the pedestrian and cycling environment.
2	Expand Road Capacity	Reconstruction and widening of the roadway, with buses continuing to operate in mixed traffic. Enhancements to the pedestrian and cycling environment would also be included in this solution.
3	Expand Active Transportation Network	Reconstruction, with the potential for widening, to enhance in corridor pedestrian and cycling facilities only.
4	Isolated Transit Measures	Reconstruction that includes localized improvements only that may include bus queue jumps, special bus stop arrangements, or transit signal priority at intersections for example. The solution would include some improvements to pedestrian and cycling accommodation at intersections only.
5	Provide Transit-Only Lanes (*TMP Solution)*	Reconstruction to provide exclusive bus transit lanes by re-allocating existing traffic lanes and/or widening the ROW. This solution does not include physical separation of the transit lanes. Full corridor enhancements to the pedestrian and cycling environment would also be included in this solution.
6	High-Occupancy Vehicle* Lanes	Re-designation to provide high-occupancy vehicles (HOV) lanes by re-allocating existing traffic lanes but does not include modifications or enhancements to the pedestrian and cycling environment on Montreal Road. Implementation of HOV lanes on Blair Road would require road widening and reconstruction in some sections.
7	Rapid Transit Separated Facility	Reconstruction and widening of the roadway to provide a continuous and separated rapid transit facility for rapid transit service (i.e bus transitway or light rail transit). Enhancements to the pedestrian and cycling environment would also be included in this solution.

*Note: A HOV lane means a lane or lanes of a roadway that have restrictions on use to encourage ridesharing. Typically, HOV lanes are open to motor vehicles carrying two or more passengers and may be made available to vehicles that use alternative fuels. Access restrictions on HOV lanes can apply 24-hours a day or only during peak congestion periods. HOV lanes would also permit transit vehicles.

Table 4-3 Alternative Solutions - Transit and Active Transportation Link

	Alternative Solution	Description
1	Do Nothing	Used as a baseline for comparison, includes maintaining the existing transit service to the Wateridge Village. Ridership and services would be reviewed and modified using existing review processes.
2	Provide Link for Active Modes	Provision for pedestrian and cycling linkages from Wateridge Village, through the NRC Campus to Blair Road or Montreal Road.
3	Provide Transit Link	Construct or designate a dedicated transit route from Wateridge Village, through the NRC Campus, to Blair Road or Montreal Road. This solution would also identify a link for pedestrians and cyclists through the NRC Campus.

A roadway link for general purpose lanes was examined as a potential solution through the NRC campus to provide access to Montreal or Blair Road, however, this alternative was screened out from further evaluation for the following reasons: it is counter to the Community Transportation Study for Wateridge Village that requires a modal shift to transit and active modes over the private automobile, and the roadway link is not supported by the NRC or the surrounding communities.

It is important to note that *Transportation Demand Management measures* are considered part of all the above solutions which includes a range of strategies that encourage individuals to reduce the number of trips they make, to travel more often by non-driving alternatives, to travel outside of peak periods and/or to reduce the length of their trips.

4.3 Evaluation Process

The full range of alternative solutions was subject to an evaluation process that compared the outcome of each solution to the planning objectives from the TMP listed in Section 4.1. The results are presented individually in the following tables for each of the Montreal Road and Blair Road Corridors and also the Transit and Active Transportation Link.

Table 4-4 Evaluation of Alternative Solutions Results – Montreal Road

		Montreal Road Alternative Solutions						
	Criteria	**1. Do Nothing**	**2. Expand Road Capacity**	**3. Expand Active Transportation Network**	**4. Isolated Transit Measures**	**5. Provide Transit-Only Lanes *(TMP Solution)***	**6. High-Occupancy Vehicle Lanes**	**7. Rapid Transit Separated Facility**
1	Support a reduction in automobile dependence	Does not contribute to reducing automobile dependency.	Provides limited opportunity as the addition of two general-purpose lanes may permit transit to run fractionally faster in mixed traffic, however, would also result in the addition of more vehicular traffic which does not support a reduction in automobile dependence. Pedestrian and cycling facilities would be enhanced from present day conditions. No direct/enhanced connection to LRT stations would be provided.	Provides limited opportunity as improved pedestrian and cycling facilities would increase those mode shares and potentially result in increased mode share for transit. However, does not result in improvements to transit facilities or direct/enhanced transit connections to LRT stations.	Provides limited opportunity to improve pedestrian, cycling and transit facilities. Other alternatives provide stronger incentives to cause greater modal shift.	Provides a good opportunity/incentive for supporting the integration/connection with the LRT stations which will make transit more attractive than the use of private automobiles. Provides improved local bus service within the corridor providing enhanced connections to employment areas along the corridor. Improved pedestrian and cycling facilities would also help reduce auto dependence and support increased transit use.	Provides limited opportunity to improve transit and connections to LRT stations but does not result in improvements to pedestrian or cycling facilities.	Delivers a project that would provide the best opportunity/ incentive for a positive modal shift towards transit. Results in highest reliability of bus service.
2	Support a multi-modal system for all ages and abilities.	Does not deliver a multi-modal system as this solution maintains existing travel lanes where transit services continue to run in mixed traffic. Cyclists would continue to navigate in a variety of settings from painted bike lanes or on-road facilities. Pedestrians would continue to be accommodated on sidewalks on both sides of the corridor.	Does not deliver an optimal multi-modal system as transit services would continue to run in mixed traffic which may improve efficiency of service to a small degree with the additional road capacity, however, does not meet transit ridership projections or required capacity. This solution does provide the opportunity to deliver enhanced pedestrian and cycling facilities to be designed for all ages and abilities. However, it would result in increased pedestrian crossing distances and higher level of stress to pedestrians and cyclists given the increase in traffic volumes.	Does not deliver an optimal multi-modal system as this solution maintains existing travel lanes and transit service would continue to run in mixed traffic which would not result in meeting transit ridership projections or required capacity. Does provide the opportunity to deliver enhanced pedestrian and cycling facilities to be designed for all ages and abilities, which would increase the mode share for pedestrians and cyclists. Would improve equity with access to enhanced and safer facilities. Would provide opportunity to increase physical activity and improve public health.	Does not deliver an optimal multi-modal system as this solution maintains existing travel lanes and provides limited opportunities to enhance transit. Transit services would be enhanced at specific locations within the corridor, primarily at intersections (bus queue jumps, signal priority), but would continue to operate in mixed traffic which would not result in meeting transit ridership projections or required capacity. The solution does provide limited opportunity to deliver enhanced pedestrian and cycling facilities to be designed for all ages and abilities, but primarily at intersections only.	Provides an optimal multi-modal system through the corridor with provision for transit-only lanes in one or both directions through re-designation of existing lanes or full reconstruction/widening of the roadway. This solution would also include improvements to the pedestrian and cycling environment for all ages and abilities recognizing that additional ROW would likely be required. Would improve equity with access to enhanced and safer facilities. It would provide an opportunity to increase physical activity and improve public health.	Does not deliver an optimal multi-modal system as this solution maintains existing travel lanes with the re-designation of lanes in one or both directions for the use of private vehicles (with multiple passengers) and transit. Compliance with the lane designation is not always adhered to; this may reduce the potential benefit it may have to transit. This solution includes only re-designation of the existing road surface, therefore there would be little opportunity to enhance the pedestrian and cycling environment for all ages and abilities. No additional ROW would be acquired.	Reconstruction would enable the construction of enhanced pedestrian and cycling facilities for all ages and abilities throughout the corridor. Further, ridership projections may not allow for a reduction in vehicle lane capacity throughout the corridor and may therefore require road widening to accommodate a fully separated facility. Would improve equity with access to enhanced and safer facilities. It would provide an opportunity to increase physical activity and improve public health.
3	Support adjacent land uses and future intensification	Would limit future land use intensification as developments would be limited to the capacity of the existing transportation network. Minimizes/avoids impacts to existing land uses.	Provides some support to existing adjacent land uses and some potential for intensification but limited ultimately by vehicle capacity of the roadway without an enhanced transit environment. Does not support transit-oriented development.	Provides minimal added support to existing adjacent land uses and minimal support for future land use intensification relying on capacity of the existing transportation network.	Provides minimal additional support to adjacent land uses as well as for future intensification relying largely on the capacity of the existing network with some localized enhancements to the transit and active transportation network.	Provides notable support for adjacent existing land uses and the opportunity for future intensification by supporting a modal shift to transit and active modes and creating more capacity in the transportation network. Maximizes opportunity for convenient and accessible bus stops. May result in reductions in access and turning movements.	Provides limited support for existing and future intensification as transit would continue to travel in mixed traffic.	Provide enhanced support for adjacent existing land uses and the opportunity for future intensification by supporting a modal shift to transit and active modes and creating more capacity in the transportation network. May result in reductions in access and turning movements.
4	Sensitive to the natural environment	There would be no impact to adjacent vegetated areas as no additional ROW space would be required. However, there would be little to no opportunity to improve corridor landscaping where little exists today.	Considerable additional ROW would be required which will impact adjacent limited natural areas (Aviation Parkway) parks and landscaped areas. However, there would be opportunity to improve corridor landscaping with the additional space.	To accommodate the project within the existing ROW there would likely be a requirement for the removal of existing corridor vegetation affecting natural areas, parks and landscaping and would offer limited opportunity for new landscaping unless additional ROW was acquired.	Localized improvements may result in modest requirements for additional ROW where impacts to corridor landscaping or adjacent vegetation could be minimized or avoided. However, provides limited opportunity for additional landscaping in the corridor.	Additional ROW would result in some impacts to adjacent vegetated areas and corridor landscaping. However, reconstruction provides opportunities to define spaces for new corridor landscaping.	Existing corridor landscaping would remain, however, there would be minimal opportunity to enhance the existing environment either than making use of existing space.	Adjacent vegetated areas and landscaping would need to be displaced at the edge to accommodate the project. To economize the footprint as much as possible, new corridor landscaping may not be possible or may provide limited opportunities.
5	Enhance the Economy	Does not provide opportunity/support for land use investment.	Does not provide opportunity/support land use investment.	Will improve movements and access within the area for pedestrians and cyclists however, provides limited support for or encouragement of land use investment.	Provides limited support for or encouragement of land use investment with measures isolated to intersections and stops.	Best opportunity to and support/encourage land use investment by providing an enhanced transit service to adjacent lands.	Does not provide opportunity/support land use investment.	Reconstruction could substantially restrict existing access to businesses and institutions. However, it could also support/encourage land use investment and transit-oriented development.

	Criteria	Montreal Road Alternative Solutions						
		1. Do Nothing	2. Expand Road Capacity	3. Expand Active Transportation Network	4. Isolated Transit Measures	5. Provide Transit-Only Lanes *(TMP Solution)*	6. High-Occupancy Vehicle Lanes	7. Rapid Transit Separated Facility
6	Deliver cost-effective services	Does not deliver a cost-effective solution. No capital cost.	Does not deliver a cost-effective solution. Focuses on enhancement of automobile capacity and pedestrian and cycling facilities but may not improve existing transit service.	Does not deliver a cost-effective solution. Enhancing pedestrian and cycling facilities only, no improvement to vehicle capacity (transit or automobile).	Does not deliver a cost-effective solution. Some improvement to pedestrian, cycling and transit facilities.	Provides opportunity to improve all modes in a cost-effective way.	Does not deliver a cost-effective solution. Limited improvements for transit facilities but does not include modifications or enhancements to pedestrian and cycling facilities.	Does not deliver a cost-effective solution. Property impacts/ requirements are likely the greatest for this option. Transit ridership projections for the corridor do not support this level of service on this corridor and would result in the highest cost of all alternatives.
7	Provide a system that is adaptable and resilient to climate change	Does not provide opportunity to adapt infrastructure to be more resilient to climate change.	With the focus on automobile use, the projects' negative contribution to climate change would be greatest compared to other solutions. Pedestrian and cycling facilities would be enhanced from present day conditions. No direct/enhanced connection to LRT stations would be provided. Increased road capacity could potentially lead to an increase in air pollution, noise and energy consumption.	Improving the pedestrian and cycling facilities only, may support a modest modal shift to active modes resulting in a modest positive impact on the corridor's contribution to climate change, however, may be negated by no improvements to transit service and continued private vehicle use leading to congestion. Provides some opportunities to build in resiliency to climate change depending on the extent of reconstruction. Expected mode share increase for walking and cycling could improve air quality and reduce congestion.	With only modest improvements and impact on modal shift, the projects' contribution to climate change would be largely unchanged and opportunities to improve resiliency would be very limited.	This solution encourages a positive impact on modal shift to transit and active modes as well a potential economization of roadway surface (i.e. narrower lanes) that would result in a positive impact on the project's contribution to climate change. Provides the opportunity to build in resiliency of the corridor to climate change effects. Increased mode share toward transit, walking and cycling would improve air quality and reduce congestion and noise.	Limited positive impact on climate change contributions is anticipated with limited modal shift to transit expected and without full reconstruction there would be little opportunity to design the corridor to improve resiliency to climate change effects.	While a modal shift to transit and active modes is expected, the number of vehicle lanes may provide limited opportunity to reduce the project's impact on climate change. Reconstruction would provide the opportunity to build-in resiliency to climate change effects. The expected increase in transit mode share would result in improvements to air quality and reductions in noise and energy consumption.
	Conclusion	Not Recommended ✗	Not Recommended ✗	Not Recommended ✗	Not Recommended ✗	Recommended Preferred Solution ✓	Not Recommended ✗	Not Recommended ✗

Table 4-5 Evaluation of Alternative Solutions Results – Blair Road

	Criteria	Blair Road Alternative Solutions						
		1. Do Nothing	2. Expand Road Capacity	3. Expand Active Transportation Network	4. Isolated Transit Measures	5. Provide Transit-Only Lanes	6. High-Occupancy Vehicle Lanes	7. Rapid Transit Separated Facility
1	Support a reduction in automobile dependence	Does not contribute to reducing automobile dependency.	Provides limited opportunity as the addition of two general-purpose lanes may permit transit to run fractionally faster in mixed traffic, however, would also result in the addition of more vehicular traffic which does not support a reduction in automobile dependence. Pedestrian and cycling facilities could be made more attractive.	Provides limited opportunity to access Blair Station from the community and development would be enhanced through improved pedestrian and cycling facilities only. Does not result in improvements to transit facilities or transit connections to LRT Stations.	Would provide some opportunity for a modal shift to transit by improving transit service primarily at intersections (queue jump lanes and signal priority). Also improves transit service by enhanced connection to the Blair Station. Provides pedestrian and cycling infrastructure improvements within the corridor as well as to the Blair Station.	Delivers a project that would provide incentive for a positive modal shift towards transit. Maintains existing capacity for general purpose vehicles in sections where there is no opportunity for a second lane to be reallocated. Space reallocation would happen where possible, such as between Ogilvie Road and Blair LRT station. This alternative could provide enhanced connections to Blair Station and new pedestrian and cycling facilities/connections.	Provides limited opportunity to improve transit. It would result in a reduction of private automobile capacity as one lane would be HOV. Would not result in improvements to pedestrian or cycling facilities. Provides limited opportunity to improve transit and connections to LRT station but does not result in improvements to pedestrian or cycling facilities.	Delivers a project that would provide incentive for a positive modal shift towards transit however, would maintain private automobile capacity. Would include enhanced connections to the Blair Station and new pedestrian and cycling facilities/connections.
2	Support a multi-modal system for all ages and abilities	Does not deliver a multi-modal system as this solution maintains existing travel lanes where transit services continue to run in mixed traffic. Cyclists would continue to navigate by sharing the roadway, or on paved shoulders. There would be no opportunity for improvements to pedestrian facilities.	Does not deliver an optimal multi-modal system, projected transit ridership is limited and this alternative does not directly improve transit services in the corridor. This solution would add two additional general-purpose travel lanes (one in each direction) within the corridor resulting in a four-lane cross-section. Capacity is not needed/justified and would be an overbuild. It could lead to induced demand. It could lead to increase in operating speeds and increase in level of stress for pedestrian and cyclists,	Does not deliver an optimal multi-modal system as this solution maintains existing travel lanes and transit service would continue to run in mixed traffic which would not result in meeting transit ridership projections or required capacity. However, does provide the opportunity to increase the modal share of pedestrians and cycling trips in the corridor with enhanced facilities for all ages and abilities which would increase the mode share for pedestrians and cyclists.	Delivers an optimal multi-modal system based on projected limited transit ridership and required capacity within the corridor. Transit services would be enhanced at specific locations within the corridor, primarily at intersections (bus queue jumps, signal priority) but would continue to operate in mixed traffic throughout the majority of the corridor. The solution does provide limited opportunity to deliver improvements to the pedestrian and cycling	Does not provide an optimal multi-modal system based on projected limited transit ridership that would not justify dedicated bus lanes for the entire corridor and transit capacity for the corridor. This solution would also include improvements to the pedestrian and cycling environment for all ages and abilities recognizing that additional ROW would be required. Would improve equity with access to enhanced and safer facilities.	Does not deliver an optimal multi-modal system as this solution requires widening of the corridor to accommodate an additional lane in each direction and buses would continue to travel in mixed traffic. Compliance with the lane designation may reduce the potential benefit it may have to transit. There would be opportunity to enhance the pedestrian and cycling environment for all ages and abilities.	Does not deliver an optimal multi-modal system because the limited transit ridership projections for the corridor would not justify this high level of service on this corridor. Reconstruction would enable the construction of enhanced pedestrian and cycling facilities for all ages and abilities throughout the corridor.

	Criteria	Blair Road Alternative Solutions						
		1. Do Nothing	2. Expand Road Capacity	3. Expand Active Transportation Network	4. Isolated Transit Measures	5. Provide Transit-Only Lanes	6. High-Occupancy Vehicle Lanes	7. Rapid Transit Separated Facility
			Provides the opportunity to deliver enhanced pedestrian and cycling facilities to be designed for all ages and abilities. Transit services would continue to run in mixed traffic which may only improve efficiency of service to a small degree.	Would improve equity with access to enhanced and safer facilities. It would provide an opportunity to increase physical activity and improve public health.	environment for all ages and abilities, primarily at intersections only. It would improve equity. It would provide an opportunity to increase physical activity and improve public health.	It would provide an opportunity to increase physical activity and improve public health.		
3	Support adjacent land uses and future intensification	Without supporting a modal shift may limit future land use intensification as developments would be limited to the existing capacity of the transportation network. Minimizes/avoids impacts to existing land uses.	Provides some support to existing adjacent land uses and some potential for intensification but limited ultimately by vehicle capacity of the roadway. Does not support transit-oriented development.	Provides minimal added support to existing adjacent land uses and minimal support for future land use intensification.	Provides support for adjacent existing land uses and provide opportunity for future intensification.	Provides added support to existing adjacent land uses and support for future land use intensification.	Provides added support to existing adjacent land uses and support for future land use intensification.	Provides enhanced support for adjacent existing land uses and provide opportunity for future intensification. May result in reductions in access and turning movements.
4	Sensitive to the natural environment	There would be no impact to adjacent vegetated areas or street trees as no additional ROW space would be required however, there would be little to no opportunity to improve corridor landscaping.	Where adjacent landscaping and green spaces would need to be displaced at the edge to accommodate the expanded cross-section, new corridor landscaping may not be possible, as this would require additional space. Results in greatest impacts to adjacent natural areas.	To accommodate the project within the existing ROW there would likely be a requirement for the removal of existing corridor landscaping and impacts to adjacent natural areas and would offer limited opportunities for new landscaping unless additional ROW was acquired.	Localized improvements may result in modest requirements for additional ROW where impacts to corridor landscaping or adjacent vegetation could be minimized or avoided however, provides limited opportunity for additional landscaping in the corridor.	Additional ROW would result in impacts to adjacent vegetated areas and corridor landscaping; however, reconstruction provides opportunities to define spaces for new corridor landscaping.	Additional ROW would result in impacts to adjacent vegetated areas and corridor landscaping; however, reconstruction provides opportunities to define spaces for new corridor landscaping.	Adjacent vegetated areas and landscaping would need to be displaced at the edge to accommodate the project. To economize the footprint as much as possible, new corridor landscaping may not be possible or limited opportunities.
5	Enhance the Economy	Does not provide opportunity/support for land use investment.	Does not provide opportunity/support land use investment.	Provides limited support for or encouragement of land use investment.	Based on projected limited ridership provides limited opportunity/support land use investment.	Based on projected limited ridership provides excess capacity that may encourage/support land use investment.	Will provide increased capacity in the transportation network that may encourage/support land use investment.	Based on projected limited ridership provides excess capacity that may encourage/support land use investment. May limit access to existing properties.
6	Deliver cost-effective services	Does not deliver a cost-effective system. No capital cost.	Does not deliver a cost-effective solution. Focuses on enhancement of automobile capacity and pedestrian and cycling facilities but may not improve transit service	Does not deliver a cost-effective solution. Enhancing pedestrian and cycling facilities only, maintains existing automobile capacity with no improvement to transit facilities.	Delivers a cost-effective solution for all modes based on projected limited transit ridership and required capacity within the corridor.	Does not deliver a cost-effective solution based on projected limited transit ridership and required capacity within the corridor resulting in an 'overbuild' of the corridor.	Does not deliver a cost-effective solution. Limited improvements for transit facilities but does include modifications/ enhancements to pedestrian and cycling facilities.	Does not deliver a cost-effective solution based on anticipated ridership and capacity requirements for the corridor. Transit ridership projections for the corridor do not support this level of service on this corridor and would result in the highest cost of all alternatives.
7	Provide a system that is adaptable and resilient to climate change	Does not provide opportunity to adapt infrastructure to be more resilient to climate change.	With the focus on automobile use, the projects' negative contribution to climate change would be greatest compared to other solutions. With reconstruction, the project could be designed to be more resilient to the effects of climate change.	Improving the pedestrian and cycling facilities only, may support a modest modal shift to active modes resulting in a modest positive impact on the corridor's contribution to climate change, however, may be negated by no improvements to transit service and continued private vehicle use leading to congestion. Provides some opportunities to build in resiliency to climate change depending on the extent of reconstruction.	Limited positive impact on climate change contributions is anticipated with limited modal shift to transit and pedestrian and cycling. Reconstruction would provide the opportunity to build-in resiliency of the infrastructure to climate change effects.	This solution encourages a positive impact on modal shift that would result in a positive impact on the projects' contribution to climate change however, additional hard surfaces would be constructed. Provides the opportunity to build in resiliency of infrastructure to climate change effects.	Limited positive impact on climate change contributions is anticipated with limited modal shift to transit and pedestrian and cycling. Reconstruction would provide the opportunity to build-in resiliency of the infrastructure to climate change effects.	A modal shift to transit and active modes is expected and may have a positive impact on the project's contribution to climate change but would require the construction of additional hard surfaces. Reconstruction would provide the opportunity to build-in resiliency of the infrastructure to climate change effects.
Conclusion		Not Recommended ✗	Not Recommended ✗	Not Recommended ✗	Recommended Preferred Solution ✓	Not Recommended ✗	Not Recommended ✗	Not Recommended ✗

Table 4-6 Evaluation of Alternative Solutions Results - Transit and Active Transportation Link

	Criteria	Alternative Solutions		
		1. Do Nothing	2. Provide Link for Active Modes	3. Provide Transit Link
1	Support a reduction in automobile dependence	Does not contribute to reducing automobile dependency. Residents would continue to use the existing transit service to Blair Station and use existing pedestrian and cycling connections.	May contribute to a modest modal shift to active modes from the community and NRC campus via a more direct connection to Montreal Road or Blair Road and the Blair Station.	Would encourage a modal shift to transit and active modes in the community and the NRC campus.
2	Support a multi-modal system for all ages and abilities	Does not deliver a multi-modal connection from the Wateridge Village community to Blair Road or Montreal Road.	Does not deliver a multi-modal connection from the Wateridge Village community to Blair Station via the NRC campus. Transit would continue to use existing routes.	Provides a multi-modal connection for transit and active modes through the NRC Campus from Wateridge Village to Blair or Montreal Road.
3	Support adjacent land uses and future intensification	Without supporting a modal shift may limit future land use intensification as developments would be limited to the existing capacity of the transportation network.	Would reinforce the Community Design Plan for Wateridge Village by providing an identified pedestrian and cycling link through NRC Campus however, does not provide a transit link that may support possible intensification of the NRC Campus.	Would fully support the implementation of the former CFB Rockcliffe Community Design Plan design for a multi-modal community and also potential intensification on the NRC Campus with an increased level of transit service.
4	Sensitive to the natural environment	Would have no impact to existing vegetation or corridor landscaping.	The link for active modes would be accommodated on the existing roadway network within the NRC Campus and the link to Wateridge Village would need to be re-established with some minor impacts to surrounding vegetation depending on the location of the link.	The link would be accommodated on the existing roadway network within the NRC Campus. The link to Wateridge Village will need to be re-established and may require some vegetation removal depending on the location of the link.
5	Enhance the Economy	Does not provide opportunity.	Provides little support for land use investment with only providing active transportation linkages.	Provides the greatest support for land use investment by improving multi-modal access to adjacent land uses.
6	Deliver cost-effective services	Does not deliver a cost-effective system. No capital cost.	Delivers a cost-effective solution however, only enhances the pedestrian and cycling facilities, no improvement to transit facilities would be provided. The existing road network would be used as much as possible.	Would result in a cost-effective connection for transit and active modes using the existing road network as much as possible.
7	Provide a system that is adaptable and resilient to climate change	Would not provide any opportunity to reduce the transportation network's contribution to climate change or allow for added resiliency in the current network.	The support for active modes would have a minimal impact on the network contribution to climate change and little could be done to increase the resiliency of the network (only areas reconstructed).	Provides a modal-shift to transit and active modes which results in a positive effect on the network contribution to climate change. Any new infrastructure could be designed to be more resilient to climate change.
Conclusion		Not Recommended ✗	Not Recommended ✗	Recommended Preferred Solution ✓

4.4 Preliminary Preferred Solution

In consideration of the planning objectives, the Preliminary Preferred Solution as rationalized in the preceding tables is to provide Transit Priority in the form of transit only lanes within the Montreal Road corridor and isolated transit measures within the Blair Road corridor and to provide a transit link (including pedestrian and cycling link) through the NRC Campus from Wateridge Village using the existing road network.

The solution for Montreal Road will include full reconstruction of the corridor as a complete street, likely with the need for some additional ROW to implement the project to also include an enhanced pedestrian and cycling environment for all ages and abilities. With a full corridor reconstruction, there may be opportunities to find space for in-corridor landscaping to enhance the streetscape and public realm environment.

The solution for Blair Road will include transit-related improvements to the corridor making transit run more efficiently. This solution will also provide economizing the existing road corridor and providing pedestrian and cycling infrastructure improvements south of Montreal Road to Blair Station. This solution will improve movements for all modes and improve the connection to Blair Station.

The active transportation and transit link through the NRC Campus may require reconstruction of existing roadways depending on the route selected and whether the transit and active modes are accommodated along the same route.

4.5 Stakeholder Consultation

4.5.1 First Round of Consultation Group Meetings

The alternative solutions were presented to the study's agency, business and public consultation groups for comment as part of an initial round of consultation activities in June 2019. Many of the comments received related to the design of the corridor which will be considered in subsequent phases of the study. Feedback from these groups included the following:

- Consider consistent active transportation facilities throughout the corridor.
- Consider space available to accommodate persons of all ages and abilities. Ensure accessibility is integrated in all solutions. Further it was noted that a high concentration of seniors are within the corridor in the vicinity of the St. Laurent and Montreal Road Intersection.
- Some concern for reducing the capacity for automobiles within the corridors.
- Consider burying overhead power lines.
- Consider planned new development along and near the corridors and potential for future intensification.
- Some concern for the existing reliability of transit service along Montreal Road.
- Consider space for snow storage in the Recommended Plan recognizing larger snow fall events.
- Consider additional corridor landscaping to assist in mitigating extreme heat for pedestrians and cyclists and waiting at bus stops.
- Consider transit, cycling and pedestrian access through the NRC campus from the Wateridge Village Community to Blair Road.
- Improved pedestrian and cycling facilities are needed on Blair Road, especially north of Montreal Road.
- Coordination is needed with the Montreal Road Revitalization and Construction Project (west of St. Laurent Boulevard) and the Stage 2 Light-Rail transit.
- Improve road safety.
- Consider downstream effects to both automobile traffic and transit users.
- Improve multi-modal integration with the Blair Station and Montreal Station.
- Consider security needs of the federal government employment centers.

For a full account of discussion from these consultation group meetings refer to Error! Reference source not found..

4.5.2 Second Round of Consultation Group Meetings

The second round of consultation for the study included meetings with the agency, business and public consultation groups on November 19 & 20 2019 as well as a Public Open House (POH) on December 4, 2019. At these meetings and the POH

the Study Team presented the Preferred Solutions for Montreal and Blair Roads as well as the Wateridge Village/NRC Transit and Active Transportation Link. Alternative design options for evaluation along with key design considerations were also presented.

The Study Team, including members from the City of Ottawa and the consultant team, were available to discuss the project and answer questions in a round table forum. At these meetings, participants were presented information that was to be communicated at the first public open house including: confirmation of project need and opportunities for the study, an overview of existing conditions, evaluation of alternative solutions and the preliminary preferred solutions, the design alternatives, evaluation methodology and criteria. Input received included discussion on the following topics:

- Enhancement and additional corridor landscaping;
- Climate change considerations/impacts;
- Public realm through placemaking opportunities;
- Discussions regarding traffic volumes and corridor capacity, especially about the 4-lane vs. 6-lane options for Montreal Road;
- Support for improving active transportation and transit in the corridor;
- Placing emphasis on redevelopment of Montreal Road in consideration of the dominant demographic which includes the elderly and those using mobility devices;
- Coordination with the Montreal Road Revitalization project;
- Opportunities to implement traffic calming measures;
- Consideration for accommodating new mobility devices within the ROW. The City is working on policies for e-bikes and scooters; and
- Redevelopment and intensification of the NRC campus.

For a full account of discussion from these consultation group meetings refer to Error! Reference source not found..

4.5.3 Public Open House #1

Public Open House #1 was held on Wednesday, December 4, 2019 at the Pat Clark Community Centre at 4355 Halmont Drive from 18:00 to 20:30. The Open House was held in a casual drop-in style format with no formal presentation and included a series of display boards (see **Appendix A**) presenting to the public the work completed to date focusing on:

- An overview of the study objectives, need and opportunities, existing conditions and study progress to-date;
- Evaluation of alternative solutions;
- Alternative design options; and
- Next steps.

The material presented on the display boards at the Public Open House was also posted on the project website and included information on:

- Welcome
- Study Overview
- What is Transit Priority
- Complete Street Approach
- Process, Consultation and Schedule
- What we've heard so far
- Need and Opportunity
- Integration with Light Rail Transit
- Existing Conditions – Transportation
- Existing Conditions – Social
- Planning Objectives and Evaluation Criteria
- Evaluation of Alternative Solutions - Montreal Road and Blair Road
- Evaluation of Alternative Solutions- Transit and Active Transportation Link
- Preliminary Preferred Solution – Montreal Road
- Preliminary Preferred Solution – Blair Road
- Preliminary Preferred Solution – Transit and Active Transportation Link
- Key Design Considerations
- Accessibility in the Design
- Property Acquisition
- Alternative Designs – Overview
- Alternative Designs – Montreal Road
- Alternative Designs – Blair Road
- Design Considerations for Transit and Active Transportation Link
- Alternative Designs – Bus Stops Alternative Designs – Macallum Street / NRC Access Road Bridge
- Evaluation of Alternative Designs - Criteria and Methodology
- Next Steps

Notification of the Open House occurred through the following mediums:

- Notices on the project website since November 5, 2019;
- Email notification of the open house to the entire project stakeholder list, including Indigenous Communities contacted on November 22, 2019;
- Advertisements in the Le Droit and the Ottawa Citizen on November 22 and November 29, 2019;
- On social media (via Twitter and Facebook);
- A buckslip was mailed out to portions of the study area in proximity to the project limits and coincident with mail routing; and
- Advertisement of the open house on the Rothwell Heights Property Owners Association webpage.

A resource table was provided which included copies of the City of Ottawa Official Plan, TMP, the Pedestrian and Cycling Plans, the Ontario *Environmental Assessment Act*, a guide to Municipal Class Environmental Assessments, and the Provincial Policy Statement.

Attendees were asked to sign-in upon entering the Public Open House. A total of 55 people signed in over the course of the evening.

To further assist in obtaining feedback from attendees, a Comment-Questionnaire was distributed at the Public Open House. Members of the public were encouraged to provide written comments via the Comment-Questionnaire and submit them either before leaving the open house or by email or regular mail. A total of 18 written comment-questionnaire forms were received, 15 emailed comments and 6 phone calls were received following the Public Open House event. A number of key themes were repeated from the comments received from the consultation group meetings. Key themes received from this round of consultation includes:

Pedestrians
Concern that the possibility of widening Montreal Road to 6-lanes will not be a friendly environment for pedestrians.
Support for a potential pedestrian connection from Wateridge Village though NRC Campus.
Concern expressed about existing pedestrian conditions on Blair Road north of Montreal Road.
Cyclists
Concern expressed regarding existing operating speeds, wide crossing distances at some intersections, unprotected bike lanes or lack of cycling facilities.
General support for improvements to cycling and pedestrian facilities and connections for both corridors.
Support for a potential cycling connection from Wateridge Village though NRC Campus.
Concern expressed about existing cycling conditions on Blair Road north of Montreal Road.
Transit
General support for transit improvements throughout both road corridors.
Support for a potential transit connection from Wateridge Village though NRC Campus
Some Rothwell Heights residents promoted the idea of a new bus service connecting Wateridge Village and NRC campus to Blair LRT station. The route would be servicing the NRC north campus, then travelling through the NRC main gates and underpass under Montreal Road, and from there to the NCR south campus and either to Blair Road or Bathgate Road south of Montreal Road to Blair station.
Support for the study focusing on moving people, not vehicles.
General dissatisfaction of the existing transit service.
Private Automobiles
Some Rothwell Heights residents expressed concern about the possibility of traffic volumes increasing from Wateridge Village and NRC and “cutting through” the Rothwell Heights community.
Concern about increased traffic volumes on Blair Road from the new Costco store and whether the study is taking that into account.
Traffic and Access
Concern that the possibility of widening Montreal Road to 6-lanes will increase traffic volumes
Corridor Design
The corridor may not achieve the arterial mainstreet potential if Montreal Road is widened to 6 lanes
How would the Montreal Road 6-lane cross section alternative transition at St. Laurent Boulevard given the more constrained cross-section to the west

General support expressed for implementing traffic calming where possible as part of the project.
Support for the study recommending improved landscaping, more trees, more shade, heated shelters and bus stops, water fountains, etc.
Concerns for the project resulting in congestion if general purpose lanes are removed/reallocated.
Inquiries how the project will integrate with the Blair LRT station and with Montreal Station that will open as part of Stage 2 LRT.
Inquiries regarding the process and details of potential property requirements.
Median Bus Lanes
Mixed reaction to median bus lanes alternative design for Montreal Road
Miscellaneous
Support for the study considering climate change mitigation and adaptation.
Entrance to CSIS is very busy which makes it difficult to cross Blair Road; often paid duty police are present to help with flow in/out.

For a full record of comments received during this round of consultation, refer to Error! Reference source not found..

4.6 Preferred Solution

In consideration of the comments received and based on the forgoing, the Preferred Solution for Montreal Road is to reconstruct the roadway to provide transit-only lanes as required between St. Laurent Boulevard and Shefford Road and enhancements to the pedestrian and cycling environments for all ages and abilities. The Preferred Solution for Blair Road is to reconstruct the roadway to provide isolated transit measures from Montreal Road to Blair Station with improvements to pedestrian and cycling environments for all ages and abilities. Each of these design solutions may require additional property to expand the City ROW to accommodate the roadway improvements. Also, a connection for transit and active modes from the Wateridge Village Community through the NRC Campus using the existing road network. These solutions will provide opportunities, through the acquisition of additional ROW within the Montreal and Blair Road Corridors or economization of the existing space, for new corridor landscaping to enhance the public realm.

The preferred solutions for Montreal Road and Blair Road were chosen as they best meet the study's planning objectives:

- Supports a reduction in automobile dependency by delivering a cost effective, multi-modal system for all ages and abilities with dedicated facilities for pedestrians and cyclists, transit and private vehicles;
- Supports adjacent land-uses and future intensification providing capacity in the transportation network and choices for travel and at the same time enhancing the economy; and
- Promotes a sustainable transportation system, resulting in an overall reduction in greenhouse gas emissions and provides an opportunity to design the project to better adapt to climate change effects.

5.0 EVALUATION OF ALTERNATIVE DESIGNS

The evaluation of alternative designs is a key phase of the environmental assessment process. For the Montreal-Blair Road corridors this phase focuses on geometric design choices while keeping in mind the varied opportunities, constraints, and environmental conditions in the corridors. To evaluate the design alternatives for Montreal Road and Blair Road a corridor-level approach was selected and represented by alternative cross-section or roadway arrangements.

5.1 Evaluation Criteria and Methodology

An evaluation methodology sets out the rationale or reasons for decision-making of the assessment process. Using a formal evaluation method has advantages such as identifying a traceable and defendable process and providing a means to demonstrate how the many aspects of the environment have been considered in a holistic and multi-disciplinary manner.

A comparative matrix approach was selected for this study as it provides a method of objectively evaluating several alternatives against multiple criteria that can be tailored to the varying study contexts. The evaluation methodology included the following tasks:

Task 1: Develop criteria considering all aspects of the environment and develop an evaluation scale to guide the assessment;
Task 2: Develop a full range of alternative designs/cross-sections that could be implemented for each of the corridors;
Task 3: Evaluate the alternatives and select a Preliminary Preferred Design to be presented for stakeholder comment;
Task 4: Confirm the Preferred Design in consideration of all comments received and documents reviewed.

5.1.1 Criteria Development And Evaluation Scale

The following broad categories were developed in consideration of the baseline environmental conditions presented in the Existing Conditions Chapter of the Environmental Study Report. The categories were also provided direction from the City of Ottawa Official Plan and supporting principles and directions in the Transportation Master Plan. Climate change considerations are considered as part of multiple criteria groups.

1. Transportation System Sustainability
2. Land Use, Social and Community Sustainability
3. Physical and Ecological Sustainability
4. Economic Sustainability

The list of criteria and their indicators developed by the Study Team of subject matter aspects are listed in Table 5-1Error! Reference source not found..

Table 5-1 Evaluation Criteria and Indicators

	#Criteria	Indicators
Transportation System Sustainability		
1	Ensure accessibility and inclusion	Provides accessible routes for persons of all ages, abilities, ethnicities, and socio-economic background along the corridor, at transit stops, and crossings.
2	Pursue pedestrian safety and comfort	Minimizes conflicts between pedestrian movements and other modes and reduces risk of serious injuries
3	Pursue cyclist safety and comfort	Minimizes conflicts between cyclist movements and other modes and reduces risk of serious injuries
4	Maximize Transit Ridership	Reduces transit travel time
5		Improves transit reliability
6		Maximizes choice for frequency of bus stops and flexibility in location
7		Provide transit user amenities

#	Criteria	Indicators
8		Enable turning movements for side street buses turning to/from the corridor
9		Facilitate connectivity to/from Confederation Line LRT System and adjacent/complimentary networks
10		Flexibility in converting design in the future to accommodate future changes in technology (ie. LRT corridor, Streetcar or other technologies)
11	Provide arterial road capacity and level of service for general purpose traffic, emergency vehicles and trucks	Provides an acceptable level of service for general purpose vehicles
12		Maintains truck route function
13		Provides acceptable access and adaptability for emergency vehicle travel
14		Maintains safety and function for service vehicles such as school buses and accessibility transportation programs (ParaTranspo)
Land Use, Social and Community Sustainability		
15	Be compatible with existing or planned land uses	Supports the land use vision for Arterial Mainstreets
16		Facilitates land use intensification
17		Minimizes the displacement of existing buildings or loss of land with redevelopment potential
18		Minimizes the loss of private approaches from the arterial road or side street
19	Ensure health, safety and security of users of the facilities	Provides location of bus stops to areas of activity or areas of high visibility
20	Protect against noise and vibration effects	Maximizes distance between the roadway (a potential noise and vibration source) and sensitive receivers
21	Protect known or potential cultural heritage resources or landscapes	Minimizes impact on existing or known cultural heritage resources or landscapes
22	Protect known or potential archeological resources	Minimizes impact on existing or known archaeological resources
Physical and Ecological Sustainability		
23	Protect terrestrial or aquatic species, protected habitats or linkage corridors	Minimizes direct impact to species or their habitats and linkage corridors
24	Limit risk to human health from areas of known contamination	Minimizes footprint in areas of known contamination (soil or groundwater)
25	Limit or reduce contribution to greenhouse gas emissions	Maximizes positive modal shift to walking, cycling and transit versus private automobile use
26		Maximize fuel efficient driving behavior
27		Minimizes the amount of materials used in construction
28	Protect corridor users from the effects of climate change	Reduce or avoid exposure to extreme temperatures or weather events
29	Protect existing and planned infrastructure from the effects of climate change	Maximizes ability to build in resiliency to infrastructure and reduce future operational costs
Economic Sustainability		
30	Preserve or re-use of existing infrastructure	Minimizes the requirement to relocate existing infrastructure (e.g. water, sewer, and utilities)
31	Limit capital construction costs	Minimizes construction costs (infrastructure, complexity)
32	Limit operational costs	Minimizes operations costs
33	Provide ability to phase construction	Maximizes opportunities for a phased project
34	Limit land requirements	Minimizes property acquisition costs

To assist in understanding how the evaluation will be conducted, Error! Reference source not found. details the evaluation scale and their associated definitions to be used by subject matter experts. Each alternative will be evaluated based on how it performs in meeting each individual indicator. This will range from performing very good to failure assuming best management practices and standard mitigation measures would be applied.

Table 5-2 Evaluation Scale and Definitions

Assessment Scale	Definition
●	Very Good: The design is expected to result in the achievement of best design practices, benchmarks, regulatory standards, or values expressed by stakeholders and, in policy and guidelines, with the performance often exceeding benchmarks.
◕	Good: The design is expected to result in the achievement of best design practices, benchmarks, regulatory standards, or values expressed by the stakeholders and in policy and guidelines as it relates to the fulfillment of the indicator.
◑	Adequate: The design is expected to result in the achievement of best design practices, benchmarks, regulatory standards, or values expressed by stakeholders and in policy and guidelines, with the performance just meeting or approaching benchmarks.
◔	Poor: There is a risk that the design may fall short of best design practices, benchmarks, regulatory standards, or values expressed by stakeholders and in policy and guidelines.
○	Fail: The design is expected to fall short of best design practices, benchmarks, regulatory standards, or values expressed by stakeholders and in policy and guidelines with the performance often below benchmarks.

5.2 Alternative Designs – Montreal Road

The preferred solution for the Montreal Road Corridor is a reconstruction of the corridor as a complete street that includes Transit-Only lanes (Exclusive Bus Lanes) along with new and enhanced separated pedestrian and cycling facilities. The preferred solution could either be implemented through full road reconstruction or re-designation of existing general-purpose lanes to include exclusive bus lanes in the corridor as a whole or in specific locations. A variety of corridor configurations/designs were developed as alternative means to implement the preferred solution. Those designs that are included in the evaluation of alternatives for Montreal Road are described below.

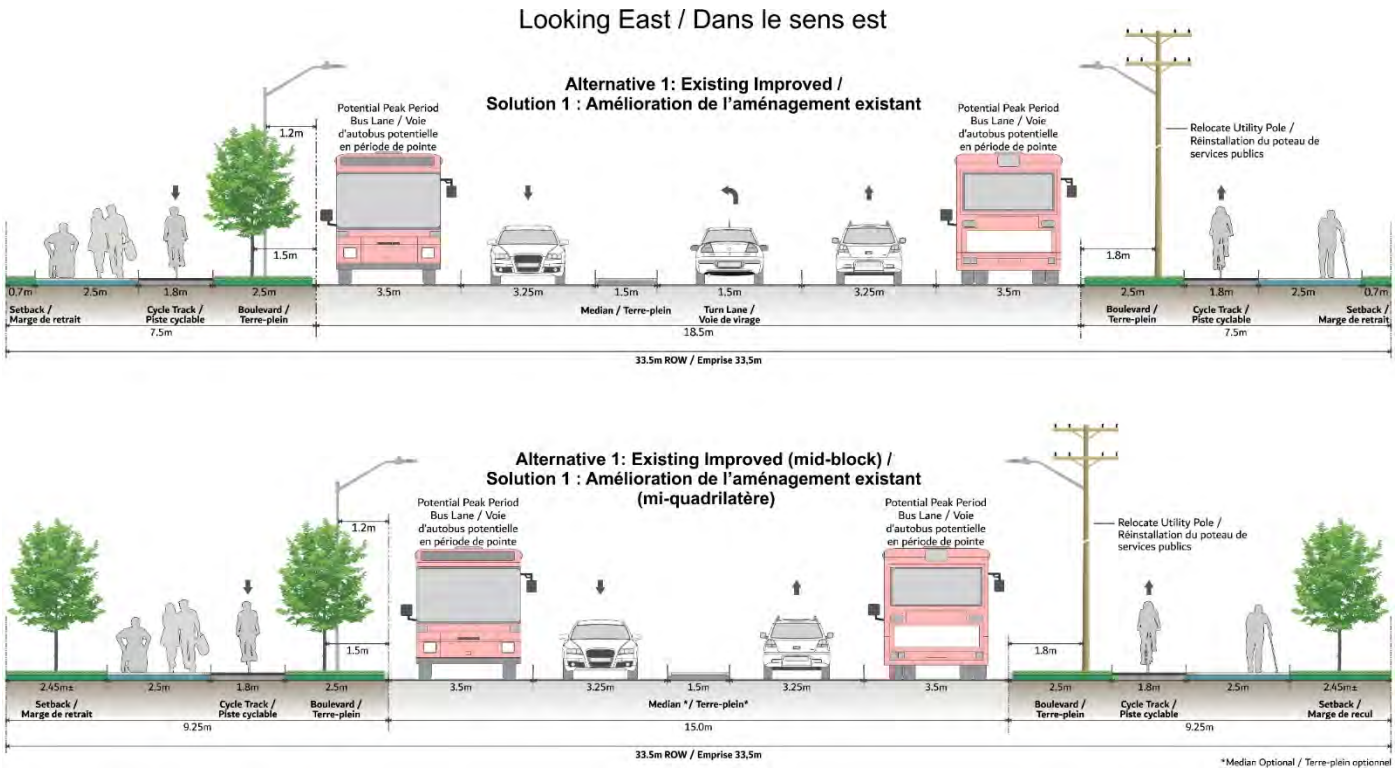
5.2.1 Alternative Design Development

The following section outlines the proposed design alternatives for the Montreal Road corridor. These alternatives will be described and presented graphically, then evaluated and summarized using the criteria previously outlined in **Section 5.1.1**.

5.2.1.1 Alternative 1: Transit Priority with Sections Of Exclusive Bus Lanes

This design includes reconstruction of the Montreal Road corridor with a similar lane configuration as exists today, however includes sections of exclusive curbside bus lanes and transit priority at intersections as illustrated in **Figure 5-1**. Segments of bus lanes and queue jump lanes would be added where they are most needed, and could be implemented as additional lanes, in combination with right-turn lanes, or by reallocating space from the existing general-purpose lanes. The boulevard area would be reconstructed to include cycle tracks and sidewalks which are physically separated from the roadway in the horizontal and vertical directions. Corridor landscaping will also be included where space permits. This alternative will require right-of-way widenings in some locations to accommodate the new design for the corridor with additional property required in some sections as well as at intersections to accommodate a protected intersection design.

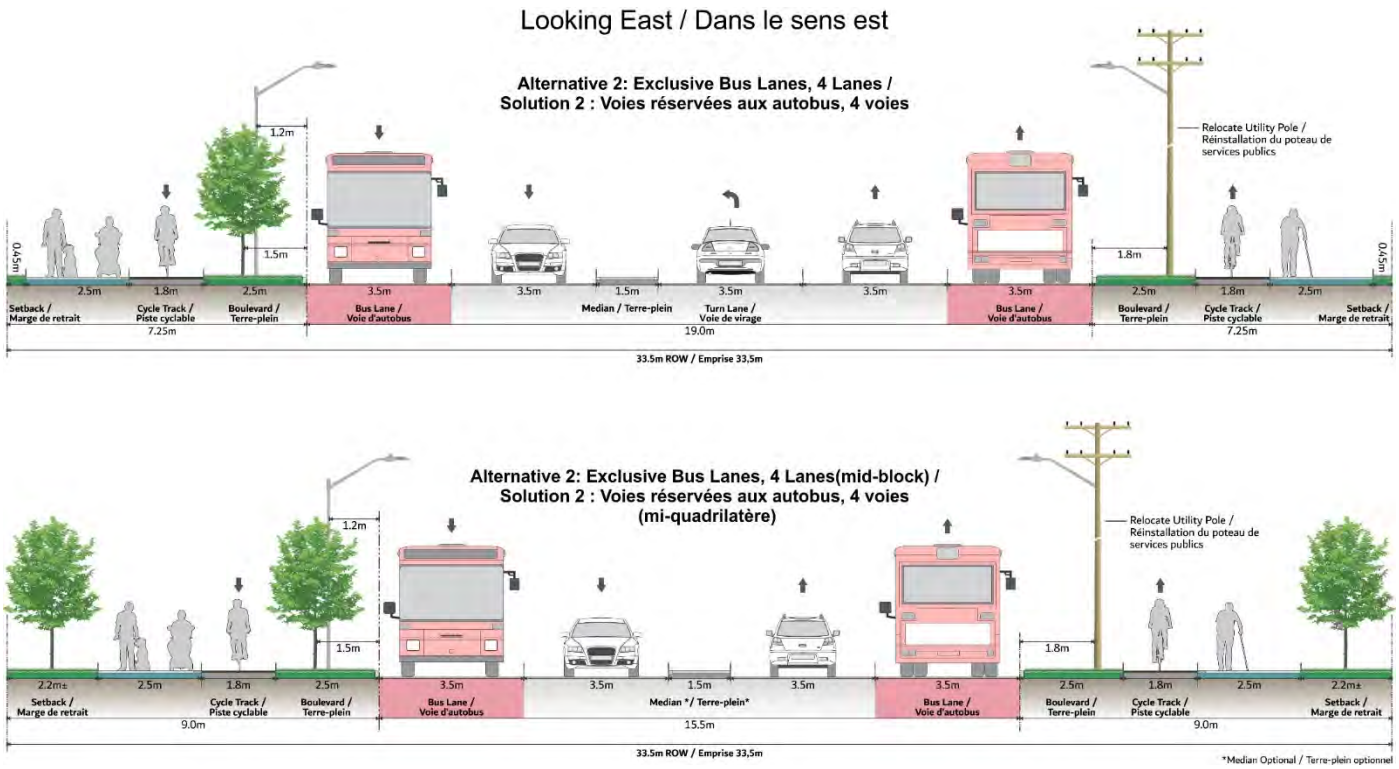
Figure 5-1 Alternative 1 - Transit Priority with Sections of Exclusive Bus Lanes



5.2.1.2 Alternative 2: Four Lane Roadway with Curbside Exclusive Bus Lanes

This design includes full corridor reconstruction to contemporary standards which includes one travel lane in each direction for general purpose vehicles (two total), and one travel lane in each direction as exclusive bus lanes located at the curb side of the roadway (two total). The boulevard area would be reconstructed to include cycle tracks and sidewalks which are physically separated from the roadway in the horizontal and vertical directions. Corridor landscaping will also be included where space permits. This alternative will require right-of-way widenings in some locations to accommodate the new design for the corridor largely within a 33.5 metre right-of-way, with more property required at intersections to accommodate a protected intersection design. This alternative is illustrated in Figure 5-2 which shows the typical roadway and boulevard elements at an intersection location, followed by these elements in a mid-block location.

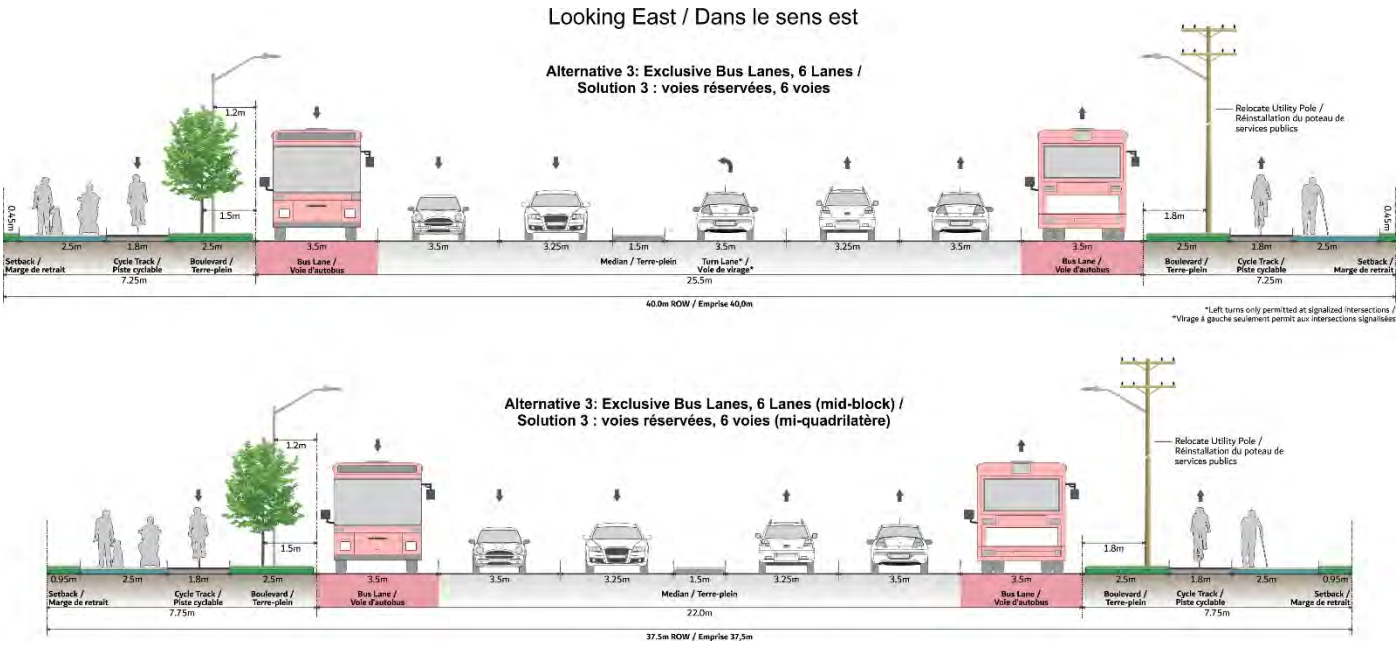
Figure 5-2 Alternative 2 – Four Lane Roadway with Curbside Exclusive Bus Lanes, Typical Cross-Sections at Intersection and Mid-Block Locations



5.2.1.3 Alternative 3: Six Lane Roadway with Curbside Exclusive Bus Lanes

This design includes full corridor reconstruction to contemporary standards to include two travel lanes in each direction for general purpose vehicles (four total), plus one curbside travel lane in each direction (two total) designated as exclusive bus lanes. The boulevard area would be reconstructed to include physically separated cycle tracks and sidewalks both horizontally and vertically. Space for corridor landscaping would also be included where space permits. This alternative will require right-of-way widenings in some locations to accommodate the new design for the corridor largely within a 37.5 metre right-of-way, with more property required in some sections as well as at intersections to accommodate a protected intersection design. This alternative is illustrated in **Figure 5-3** which shows the typical roadway and boulevard elements at an intersection location, followed by these elements in a mid-block location.

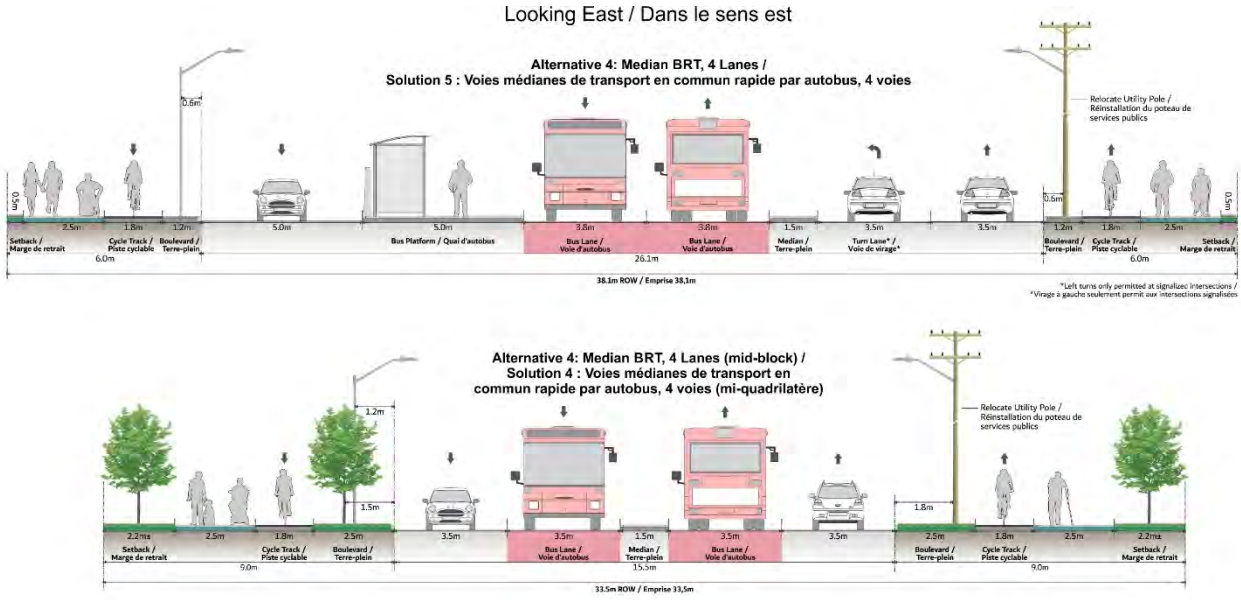
Figure 5-3 Alternative 3 Six Lane Roadway with Curbside Exclusive Bus Lanes, Typical Cross-Section at Intersection and Mid-Block Locations



5.2.1.4 Alternative 4: Four Lane Roadway with Median Exclusive Bus Lanes

This design includes full corridor reconstruction to contemporary standards to include one travel lane in each direction for general purpose vehicles (two total), plus one exclusive bus lane in each direction (two total) located at the median of the roadway. A bus platform at intersections will be required for pedestrians to provide safe access and waiting areas to the median exclusive bus lanes. The boulevard area would be reconstructed to include physically separated cycle tracks and sidewalks both horizontally and vertically, Space for corridor landscaping would also be included where space permits. This alternative will require right-of-way widenings in some locations to accommodate the new design for the corridor largely within a 33.5 metre right-of-way, with more property required at intersections to accommodate a protected intersection design and the bus station platforms. This alternative is illustrated in **Figure 5-4** which shows the typical roadway and boulevard elements at an intersection location, followed by these elements in a mid-block location.

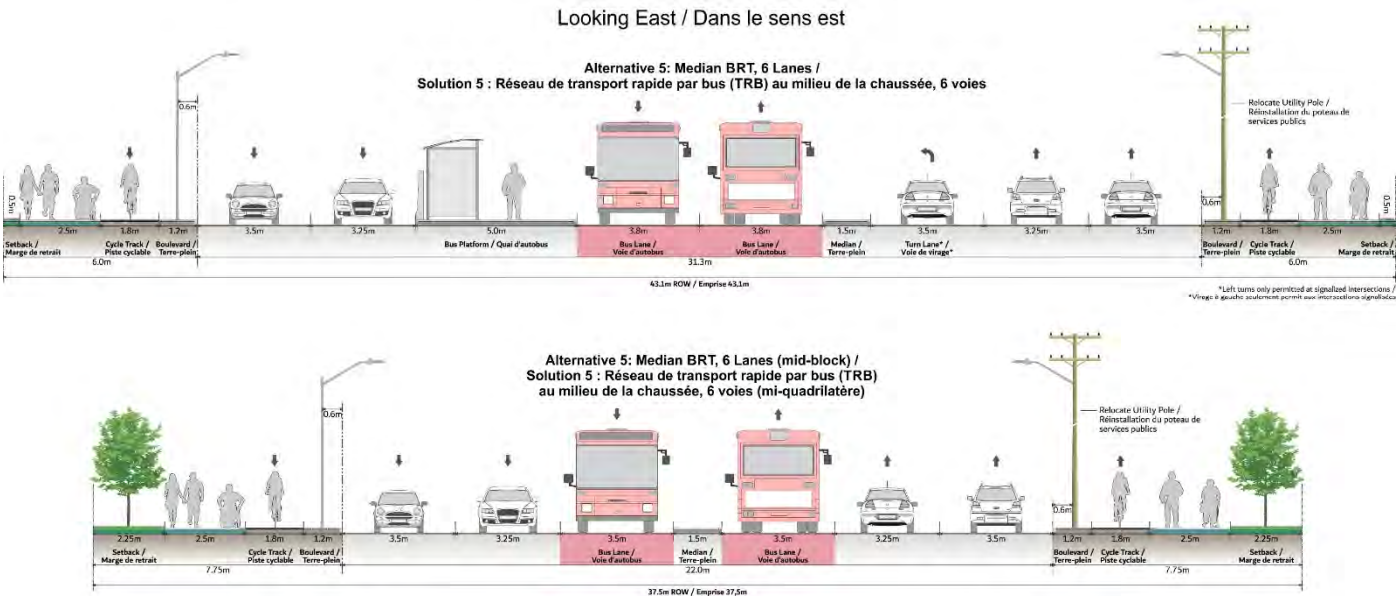
Figure 5-4 Alternative 4 -Four Lane Roadway with Median Exclusive Bus Lanes, Typical Cross-Section at Intersection and Mid-Block Locations



5.2.1.5 Alternative 5: Six Lane Roadway with Median Exclusive Bus Lanes

This design includes full corridor reconstruction to contemporary standards to include two travel lanes in each direction for general purpose vehicles (four total) plus one median exclusive bus lane in each direction (two total) of the roadway. A bus platform at intersections will be required for pedestrians to provide safe access and waiting areas to the median exclusive bus lanes. The boulevard area would be reconstructed to include physically separated sidewalks and cycle tracks both horizontally and vertically. Space for corridor landscaping would also be included where space permits. This alternative will require right-of-way widenings in some locations to accommodate the new design for the corridor largely within a 37.5 metre right-of-way, with more property required in some sections as well as at intersections to accommodate bus platforms and a protected intersection design. This alternative is illustrated in **Figure 5-5** which shows the typical roadway and boulevard elements at an intersection, location followed by these elements in a mid-block location.

Figure 5-5 Alternative 5 – Six Lane Roadway with Median Exclusive Bus Lanes, Typical Cross-Section at Intersection and Mid-Block Locations



5.2.2 Evaluation of Alternative Designs - Montreal Road

The evaluation of Montreal Road is provided in **Table 5-3**. The detailed evaluation reveals that overall Alternative 1, Transit Priority with sections of exclusive bus lanes outperform across most indicator groups compared to the other four alternatives.

Table 5-3 Evaluation of Alternative Designs for Montreal Road

CRITERIA		INDICATORS	Alternative 1 TRANSIT PRIORITY WITH SECTIONS OF EXCLUSIVE BUS LANES	Alternative 2 FOUR LANE ROADWAY WITH CURBSIDE BUS LANES	Alternative 3 SIX LANE ROADWAY WITH CURBSIDE BUS LANES	Alternative 4 FOUR LANE ROADWAY WITH MEDIAN BUS LANES	Alternative 5 SIX LANE ROADWAY WITH MEDIAN BUS LANES	RATIONALE
TRANSPORTATION SUSTAINABILITY								
1	Ensure accessibility and inclusion	Provides accessible routes for persons of all ages, abilities, ethnicities, gender, and socio-economic background along the corridor, at transit stops and crossings	◑	◕	◑	◕	◑	Median bus platforms require pedestrians to cross cycle tracks and the roadway to access transit; however, the crossing is at a traffic signal-controlled location. For curb side bus stops, pedestrians are required to cross cycle tracks at non-signal controlled locations. Walking distance to bus stops at intersections will be greater for 6 lane alternatives.
2	Pursue pedestrian safety and comfort	Minimizes conflicts between pedestrian movements and other modes	◕	◕	◑	●	●	All alternatives provide new sidewalks, seating and other amenities. Crossing distances for return travel in curb side alternatives will be longer than for station locations within the median. Acknowledge that curb side stops will be closer for one direction travel.
3	Pursue cyclist safety and comfort	Minimizes conflicts between cyclist movements and other modes	◕	◕	◑	◕	◑	All alternatives provide raised cycle tracks and protected intersections. Median Bus Lane alternatives eliminate the need for pedestrian/cyclists to mix at bus stops.
4	Maximize Transit Ridership	Reduces transit travel time	◕	◕	◕	●	●	All alternatives except for alternative 1 include continuous exclusive bus lanes. However, the median bus lane alternatives will avoid the need for buses to mix with right-turning vehicles at intersections and private approaches, and the Curb Side 2 + 2 (alternative 2) will bring some added additional congestion that buses will need pass through. Alternative 1 and 2 score similarly as transit priority will increase transit travel times during peaks and allow for increased vehicle travel during non-peak transit times.
5		Improves transit reliability	◑	◕	◕	●	●	All alternatives include exclusive bus lanes in some portion of the study area. However, the median bus lane alternatives will avoid the need for buses to mix with right-turning vehicles at intersections and private approaches, and the Curb Side 2 + 2 alternative (alternative 2) will bring some additional congestion that buses will need pass through.
6		Maximizes choice for frequency of bus stops and flexibility in location	●	●	●	◑	◑	The median bus lane alternatives require decisions on permanent bus platform locations and may result in greater spacing and longer walking distances to bus stops.
7		Provide transit user amenities	◕	◕	◕	●	●	All alternatives provide transit platforms and shelters. The median options provide more space for amenities including the potential for ticket vending machines, security systems, seating, and bicycle parking.
8		Enable turning movements for side street buses turning to/from the corridor	●	●	●	◔	◔	Median bus lanes introduce some complexities for local bus routes to turn to/from side streets. Alternative 1 also introduced complexity for turning onto the corridor when mixed with general traffic.
9		Facilitate connectivity to/from Confederation Line LRT System and adjacent/complimentary networks.	●	●	●	◑	◑	Connection at Montreal Station on Confederation line will be a curb side platform and would require transitions for median options (alternatives 4 and 5). Transit Priority Corridor west of St. Laurent Boulevard includes curb side transit priority lane in the westbound direction that would require a transition for median options.
10		Flexibility in converting design in the future to accommodate future changes in technology (i.e., LRT corridor, Streetcar, or other technologies)	◑	◔	◕	◕	●	The 6-Lane alternatives protect a wider corridor for possible conversions in the future and allow for the possibility of providing on-street parking in mainstreet locations to support adjacent mixed use land uses or accommodate electric vehicle charging stations.
11	Provide arterial road capacity and level of service for general purpose traffic and trucks	Provides an acceptable level of service for general purpose vehicles	◕	◔	●	◔	●	The 6-lane alternatives and transit priority alternative maintain the existing roadway capacity and similar levels of service at the major intersections. The 4-lane continuous bus lane alternatives will reduce existing roadway capacity and may reduce levels of service at intersections, and this may cause delay for general traffic. Further, should left or right-turn queues exceed their storage capacity, potential spill-over to the single general-purpose lane could occur. The median bus lane options have the benefit of removing buses from traffic flow along the curb. This will decrease delays, queues and driver frustration increasing safety within the corridor.
12		Maintains truck route function	●	◑	●	◔	◕	The 6-lane alternatives maintain the existing roadway capacity and similar levels of service at the major intersections. The 4 lane alternatives will reduce existing roadway capacity and may reduce levels of service at intersections, and this may delay goods movement. The median bus lane options have the benefit of removing buses from traffic flow along the curb.
13		Provides acceptable access and adaptability for emergency vehicle travel	◕	◑	●	◑	●	All alternatives will be designed to ensure emergency vehicles have room to maneuver in case of an emergency, although the 6-lane alternatives will provide an additional general-purpose lane to assist in maintaining traffic flow should lanes become blocked.

CRITERIA		INDICATORS	Alternative 1 TRANSIT PRIORITY WITH SECTIONS OF EXCLUSIVE BUS LANES	Alternative 2 FOUR LANE ROADWAY WITH CURBSIDE BUS LANES	Alternative 3 SIX LANE ROADWAY WITH CURBSIDE BUS LANES	Alternative 4 FOUR LANE ROADWAY WITH MEDIAN BUS LANES	Alternative 5 SIX LANE ROADWAY WITH MEDIAN BUS LANES	RATIONALE
14		Maintains safety and function for service vehicles such as school buses and accessibility transportation programs (ParaTranspo)	●	◑	●	◑	●	School buses could travel in general purpose traffic while ParaTranspo buses could make use of the transit lanes as required. Additional congestion may be experienced in the 4-lane alternatives.
		CRITERIA GROUP SUBTOTAL	●	◕	●	◕	●	
LAND USE, SOCIAL AND COMMUNITY SUSTAINABILITY								
15	Be compatible with existing or planned land uses	Supports the land use vision for Arterial Mainstreets	◕	●	◑	●	◑	All alternatives can help promote a mixture of land uses and development patterns where buildings are located along the street lot line with minimal setbacks, with parking to be provided to the rear or sides of buildings. 4-lane alternatives more aggressively support the city's objective to promote more sustainable modes.
16		Facilitates land use intensification	◕	◑	◕	◕	●	The 6-lane median bus lanes best facilitates land use intensification as it best maximizes transit ridership while also maximizing capacity and level of service for general purpose traffic and trucks.
17		Minimizes the displacement of existing buildings or loss of land with redevelopment potential	◕	●	◑	◑	◔	The 6-lane alternatives require a wider right-of-way and have the potential to displace more buildings and development land.
18		Minimizes the loss of private approaches from the arterial road or side street	●	◕	◑	◔	◔	The 6-lane alternatives would require median separation to eliminate left-turn movements to individual properties between intersections. Continuous curb-side options introduce the variant of bus movements at driveways.
19	Ensure health, safety and security of users of the facilities	Provides location of bus stops to areas of activity or areas of high visibility	◕	◕	◕	●	●	All bus stop locations will be ideally located in activity nodes providing high visibility for all alternatives. Bus stops in the median alternatives will be well illuminated with the adjacent roadway with clear lines of site.
20	Protect against noise and vibration effects.	Maximizes distance between the roadway (a potential noise and vibration source) and sensitive receivers	◕	●	◔	◕	◑	Buses may result in greater noise and vibration levels depending on technologies used and the condition of the road, therefore alternatives that locate buses away from land uses (i.e., in the median) would perform better recognizing that 6-lane alternatives also bring the roadway closer to land uses by consuming more ROW. Slower traffic in more congested lanes may also reduce noise and vibration from vehicles.
21	Protect known or potential cultural heritage resources or landscapes	Minimizes impact on existing or known cultural heritage resources or landscapes	No difference between Alternatives					Existing and potential cultural heritage resources and landscapes occur along the corridor. Differences between alternatives will be insignificant.
22	Protect known or potential archeological resources	Minimizes impact on existing or known archaeological resources	No difference between Alternatives					Archaeological potential occurs along the corridor adjacent to the existing ROW. Differences between alternatives will be insignificant.
		CRITERIA GROUP SUBTOTAL	●	●	◕	◕	◕	
PHYSICAL AND ECOLOGICAL SUSTAINABILITY								
23	Protect terrestrial or aquatic species, protected habitats, or linkage corridors	Minimizes direct impact to species or their habitats and linkage corridors	◕	◕	◑	◕	◑	The corridor is located in an existing urban centre with only small sections of natural areas including the lands associated with the Aviation Parkway and Urban Natural Feature in the southwest corner of the Codd's/Montreal/Carson's intersection. Corridor landscaping is largely absent however some treed development sites exist currently but are zoned for development. Differences between alternatives will be minimal.
24	Limit risk to human health from areas of known contamination	Minimizes footprint in areas of known contamination (soil or groundwater)	◕	◕	◑	◕	◑	Sites adjacent to the corridor range from low to high risk with respect to contamination, depending on the historical use of the lands. Differences between the alternatives will be minimal.
25	Limit or reduce contribution to greenhouse gas emissions	Maximizes positive modal shift to walking, cycling and transit versus private automobile use	◕	●	◑	●	◕	Alternatives that maximize walking, cycling, and transit ridership, and that limit automobile capacity, will provide greater incentive for modal shift that in turn would result in lower greenhouse gas emissions.
26		Maximize fuel efficient driving behavior	◕	◔	◑	◑	●	Alternatives that maintain existing capacity for general traffic will reduce congestion and limit the need for stop and go traffic movement resulting in more fuel-efficient driving behavior. Curb side bus lane alternatives require buses to mix with general traffic at intersections that could contribute to congestion.

CRITERIA		INDICATORS	Alternative 1 TRANSIT PRIORITY WITH SECTIONS OF EXCLUSIVE BUS LANES	Alternative 2 FOUR LANE ROADWAY WITH CURBSIDE BUS LANES	Alternative 3 SIX LANE ROADWAY WITH CURBSIDE BUS LANES	Alternative 4 FOUR LANE ROADWAY WITH MEDIAN BUS LANES	Alternative 5 SIX LANE ROADWAY WITH MEDIAN BUS LANES	RATIONALE
27		Minimizes the amount of materials used in construction	◕	●	◑	◕	◔	Facilities with fewer travel lanes will require less materials for construction including roadbed materials and asphalt.
28	Protect corridor users from the effects of climate change	Reduce or avoid exposure to extreme temperatures or weather events	◕	◕	◑	◕	◑	Narrower road surface areas will provide more room in boulevard areas for street landscaping. Curb side facilities will provide more opportunity for shelter enhancements.
29	Protect existing and planned infrastructure from the effects of climate change	Maximizes ability to build in resiliency to infrastructure and reduce future operational costs	◕	◕	◑	◕	◑	All alternatives require full reconstruction and offer opportunities to build-in resiliency measures however 4-lane alternatives provide less overall infrastructure vulnerable to climate change extreme weather events.
		CRITERIA GROUP SUBTOTAL	◕	◕	◑	◕	◕	
ECONOMIC SUSTAINABILITY								
30	Preserve or re-use of existing infrastructure	Minimizes the requirement to relocate existing infrastructure (e.g., water, sewer, and utilities)	◕	●	◑	◑	◔	All alternatives will require relocation of overhead utilities. Underground watermains occur between St. Laurent and Wanaki/Bathgate Roads and between Ogilvie Road and Hwy 174. Stormwater collection pipes occur between St. Laurent and Brittany, Cummings and Den Haag, Marquis and Ogilvie Road.
31	Limit capital construction costs	Minimizes construction costs (infrastructure, complexity)	●	●	◑	◑	◔	The 4-lane alternatives will result in lower capital cost than 6-lane alternatives due to the width of the corridor required. Median alternatives will be slightly more costly due to more materials required.
32	Limit operational costs	Minimizes operations costs	●	●	◑	◔	◑	The 4-lane alternatives will result in lower operational costs than 6-lane alternatives due to the width of the corridor required. Median alternatives will be slightly more costly due to more materials in place and snow removal will take two lane widths and require closure of the bus lane to complete. The same complexities will occur for other repairs.
33	Provide ability to phase construction	Maximizes opportunities for a phased project	◑	◑	◑	◔	◕	All alternatives require full reconstruction with limited opportunity to maintain existing infrastructure. Wider right-of-way allows more flexibility to maintain traffic flow in both directions during construction.
34	Limit land requirements	Minimizes property acquisition costs	◕	●	◔	◑	◔	4 lane alternatives will result in lower property acquisition costs than 6 lane alternatives due to the width of the corridor required.
		CRITERIA GROUP SUBTOTAL	●	●	◑	◑	◑	
		TOTALS ACROSS CRITERIA GROUPS	●	◕	◔	◑	◑	

5.2.3 Stakeholder Input and Additional Review

Following identification of the preliminary preferred alternative, the study team met with a number of internal stakeholders to discuss the plan and gain feedback. At the same time a number of city initiatives were taking place as well as the outbreak of the Covid 19 pandemic that required further consideration including:

- Development of a new Official Plan and Transportation Master Plan;
- Additional Transportation Analysis; and
- Property Impacts

These influencing factors are described below.

5.2.3.1 Development of a new Official Plan and Transportation Master Plan

During the course of the study, the City began their five-year review of the Official Plan and supporting Master Plans including the Transportation Master Plan. As part of the project, the city developed new population projections and a growth management strategy. The New Official Plan is built on the vision for Ottawa to become the most liveable mid-sized city in North America over the next century. The major themes or cross cutting issues of the new OP include intensification, economic development, energy and climate change, healthy and inclusive communities, gender equity, and culture. To address some of the issues, the use of more compact and dense development within existing urban landscapes and corridors is supported. This includes increasing density of existing urban development and therefore increasing the number of people living within 15-minutes to amenities such as transit. Intensification targets are directed to hubs and corridors such as the Montreal Road corridor. Section 2.2.1 specifically states that the City will:

> *Ensure that the development and redevelopment of transit, road and active transportation infrastructure supports the City's intensification targets;*

This requires consideration for the impacts that transit projects will have on surrounding land uses and existing development beyond providing more efficient and large-scale transportation solutions. Although sustainable transportation is a priority for overall development and progression of the city, the use of and trade-offs with surrounding land and property must be carefully considered.

As per the OP, this portion of Montreal Road is identified as a 'Mainstreet corridor' and is part of the Inner Urban Transect and notes the following:

> *The transportation network for the Inner Urban Transect shall: a) Prioritize walking, cycling and transit; and b) Accommodate motor vehicle access and movement provided doing so does not erode the public realm nor undermine the priority of pedestrians, cyclists and transit users.*

The Transportation Master Plan is very closely connected with the development of the New Official Plan and the City's Climate Change Master Plan. Together, these plans will form the basis for the city to move forward in a sustainable way. The City's population projections and growth management strategy contributes to developing the transportation model for the City understanding where people are moving and where new or enhanced facilities are required.

5.2.3.2 Additional Transportation Analysis

Based on stakeholder and public comments received on the preliminary preferred alternative, additional analysis was undertaken to confirm the validity of the preferred alternative, particularly its ability to perform adequately based on future traffic growth out to the year 2046. This step was critical in ensuring the preferred alternative design not only best reflects the design criteria as identified in the evaluation, but also takes into consideration other less quantifiable criteria related to traffic, ridership, pedestrian and cyclist use and safety, property, and overall feasibility. A technical memo was produced to further assess intersection capacity, travel time, and potential operational constraints along the Montreal Road corridor. The following sections summarize these findings, with full details of the memo seen in **Appendix B**.

Short- and Long-Term Traffic Needs and Ridership

The additional analysis provided insight into projected traffic volumes and transit ridership along the corridor to confirm general purpose vehicle lane requirements in the Montreal Road corridor and the level of transit priority needed based on projected ridership and the impact of traffic congestion on transit performance. This required additional use of the

City's TRANS model to develop various scenarios (e.g. one general purpose lane versus two general purpose lanes) as well as operational modeling using the SYNCHRO and VISSIM platforms.

The modelling also used updated land use assumptions projected to the year 2046 but based on the City's 2031 transportation network as future 2046 network updates have not yet been identified as part of the ongoing TMP update. It is acknowledged that by using these land use assumptions within a 2031 network capacity, constraints may be artificially created that may be addressed by the future 2046 transportation network.

The analysis had the following conclusions:

- Two general purpose lanes in each direction are needed within the Montreal Road corridor from St. Laurent Boulevard to Shefford Drive based on existing traffic volumes;
- A moderate to significant vehicle reduction is required for one general purpose lane per direction to function adequately;
- Based on historical traffic volumes and future land use potential, a reduction in traffic volumes is unlikely to occur in the short to medium-term;
- Auxiliary left and right turn lanes are required for heavy left and right turn movements for adequate intersection performance;
- Based on preliminary review there are at least 9 locations where auxiliary right-turn lanes will need to be maintained;
- While one general purpose lane and one transit lane per direction result in lower auto usage and increased transit ridership along Montreal Road, the majority of auto traffic is merely diverting to parallel routes within the City, which may not have capacity to accommodate this traffic; and,
- The potential investment in higher order transit (BRT) over curbside bus lanes was not shown to yield significant increases in transit ridership (only 3% - 5%) along Montreal Road.

Active Transportation in the Corridors

Within all the proposed designs and evaluations, active transportation improvements were considered and implemented as a priority. The proposed designs were all intended to accommodate continuation of existing active transportation routes and facilities in the corridor and provide improved accessibility, travel time, and overall safety. The use of raised cycle tracks and pedestrian sidewalks encourages active transportation and multi-modal connection to other active transportation corridors in the area.

5.2.4 Preliminary Preferred Design – Montreal Road

The preferred alternative (Transit Priority with sections of exclusive bus lanes) for Montreal Road was developed into a preliminary preferred design for the transit, roadway and active transportation components of the project. This design went through multiple iterations and refinement based on stakeholder input and comments, focused primarily on:

- Transit priority treatments
- Roadway geometry
- Traffic operations
- Property impacts
- Active transportation facilities

5.3 Alternative Designs – Blair Road

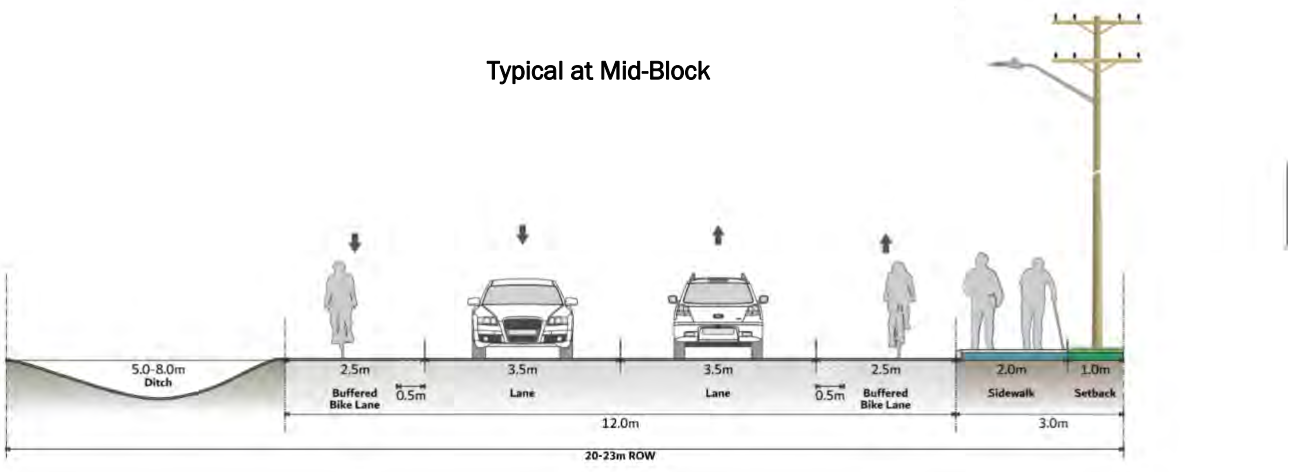
5.3.1 Alternative Design Development– North of Ogilvie Road

The transportation assessment of travel demand to year 2046 showed that widening of Blair Road to add dedicated bus lanes was not required. The following section outlines the proposed design alternatives for the Blair Road corridor between Ogilvie and Montreal Road. These alternatives will be described and presented graphically, then evaluated and summarized using the criteria previously outlined in **Section 5.1.1**.

5.3.1.1 Alternative 1: Two Lane Roadway with Designated Cycling Lanes

This design would improve the existing roadway by providing isolated transit priority measures and protected intersection design features and buffered on-road bike lanes on both sides. Buses would continue operating in mixed traffic for most of the corridor length. Corridor landscaping will also be included where space permits along the edges of the right-of-way. The alternative will require reengineering/reconstruction of the drainage swale on the west side of the corridor to accommodate for an increased right-of-way along the corridor. Additional right-of-way will be required to implement the design. This alternative is illustrated in **Figure 5-6,** which shows the typical roadway and boulevard elements in an intersection and mid-block location.

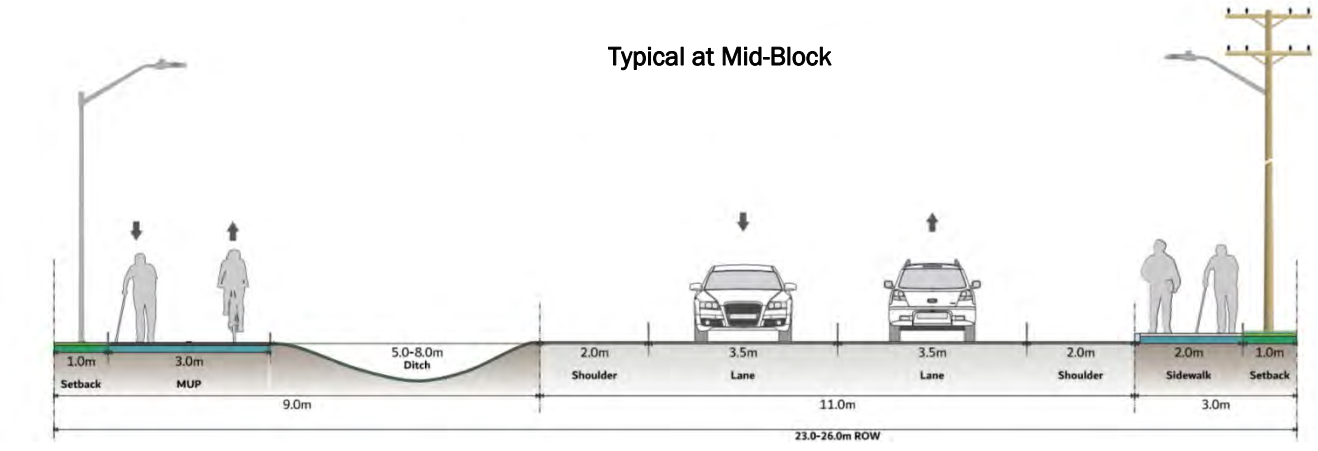
Figure 5-6 Alternative 1 – Two Lane Roadway with Designated Cycling Lanes - Typical Cross Section at Mid-Block Location



5.3.1.2 Alternative 2: Two Lane Shared Roadway with Multi-Use Pathway

This design would improve the existing roadway by providing isolated transit priority measures and protected intersection design features as well as a new northbound cycle track on the east side and a new multi-use pathway on the west side. The alternative will require reengineering/reconstruction of the drainage swale on the west side of the corridor to accommodate for an increased right-of-way along the corridor and implementation of the Multi-Use Pathway. Additional right-of-way will be required. This alternative is illustrated in **Figure 5-7** which shows the typical roadway and boulevard elements at an intersection location (identical to alternative 1) and mid-block location.

Figure 5-7 Alternative 2 –Two Lane Roadway with Mixed Traffic Use and MUP, Typical Cross-Section at Mid-Block



5.3.2 Evaluation Of Alternative Designs - Blair Road

The evaluation of Blair Road (Montreal Road to Ogilvie Road) is provided in **Table 5-4.** The detailed evaluation reveals that overall, Alternative 2 (improved existing and the addition of a MUP and designated cycle track) outperforms overall compared to Alternative 1 (improved existing). A discussion of the evaluation results is included below.

Table 5-4 Evaluation of Alternative Designs for Blair Road from Montreal Road to Ogilvie Road

CRITERIA		INDICATORS	Alternative 1 TWO LANE ROADWAY WITH DESIGNATED CYCLING LANES	Alternative 2 TWO LANE ROADWAY WITH MUP AND CYCLE TRACK	RATIONALE
TRANSPORTATION SUSTAINABILITY					
1	Ensure accessibility and inclusion	Provides accessible routes for persons of all ages, abilities, ethnicities, gender, and socio-economic background along the corridor, at transit stops and crossings	◔	◕	Alternative 1 provides a sidewalk on the east side only and buffered on-road bike lanes on either side to accommodate cyclists and other mobility devices. Pedestrians would have to cross at intersections to access uses on the west side. On-road cycling is not considered ideal for all ages and abilities. Bike lane may be blocked by cars and buses around bus stops. Alternative 2 includes separated raised cycle track and improved sidewalk on the east side and multi-use pathway (MUP) on the west side which will allow for access for both users on either side of the roadway. Potential conflicts between pedestrians and other users will be slightly greater on the MUP as users are mixed in both directions.
2	Pursue pedestrian safety and comfort	Minimizes conflicts between pedestrian movements and other modes	◑	◕	Conflict between pedestrians and other modes of traffic is minimized by Alternative 1 as bicycles are accommodated on the street however motorized vehicles and buses will block the cycling lane at bus stops, and no pedestrian facility is provided on the west side. Alternative 2 separates pedestrians and cyclists on the east side only. Potential for conflicts also occur at bus stops as cyclists and pedestrians will be at the same level.
3	Pursue cyclist safety and comfort	Minimizes conflicts between cyclist movements and other modes	◔	◕	Alternative 1 provides on-road cycling facilities only. Alternative 2 provides a separated facility (cycle track) on the east side, and shared multi-use pathway on the west side. While conflicts may occur on either facility, the potential to encounter motorized vehicles is greater in alternative 1.
4	Maximize Transit Ridership	Reduces transit travel time	◕	◕	Transit priority is provided at the intersection of Blair and Montreal Road for both alternatives.
5		Improves transit reliability	◕	◕	Transit priority is provided at the intersection of Blair and Montreal Road for both alternatives.
6		Maximizes choice for frequency of bus stops and flexibility in location	◕	◕	Transit priority is provided at the Blair and Montreal Road intersection for both alternatives. Bus stops can equally be placed within the corridor.
7		Provide transit user amenities	◕	◕	Additional space will be required to accommodate bus stops in either alternative.
8		Enable turning movements for side street buses turning to/from the corridor	◕	◕	Roadway configuration is equal to both alternatives.
9	Provide arterial road capacity and level of service for general purpose traffic and trucks	Provides an acceptable level of service for general purpose vehicles	◕	◕	Roadway configuration is equal to both alternatives.
10		Maintains truck route function	◕	◕	Roadway configuration is equal to both alternatives.
		CRITERIA GROUP SUBTOTAL	◑	◕	
LAND USE, SOCIAL AND COMMUNITY SUSTAINABILITY					
11	Be compatible with existing or planned land uses	Supports the land use vision for arterial road and transit priority corridor	◑	●	Alternative 2 provides a MUP connecting to the existing Blair Station, Gloucester Centre, and future Blair Mixed-Use Centre south of Ogilvie and making a more friendly and adaptable transit corridor for use by the public by adjacent employment uses located on the west side of the corridor.
12		Facilitates land use intensification	◑	●	Employment lands exist on the west side of the corridor with space for intensification compared to east side which is composed of a mature residential neighborhood where only minor infill projects are likely to occur. Alternative 2 provides a better opportunity to serve land use intensification by providing both pedestrian and cycling facilities on both sides of the corridor.
13		Minimizes the displacement of existing buildings or loss of land with redevelopment potential	◕	◕	Additional land is required to accommodate multi-use pathway for Alternative 2 and at intersections for both alternatives. No existing buildings are impacted.
14		Minimizes the loss of private approaches from the arterial road or side street	◕	◕	Both options do not impact existing private approaches either than if in proximity to major intersections.

CRITERIA		INDICATORS	Alternative 1 TWO LANE ROADWAY WITH DESIGNATED CYCLING LANES	Alternative 2 TWO LANE ROADWAY WITH MUP AND CYCLE TRACK	RATIONALE
15	Ensure health, safety and security of users of the facilities	Provides location of bus stops to areas of activity or areas of high visibility	●	●	All bus stop locations will be ideally located in activity nodes providing high visibility for all alternatives. Bus stops will be well illuminated with the adjacent roadway with clear lines of site.
16	Protect against noise and vibration effects.	Maximizes distance between the roadway (a potential noise and vibration source) and sensitive receivers	◕	◕	Slowing of traffic and buses within mixed traffic lanes has potential to reduce vibrations and noise from fast moving vehicles. Residences will be slightly more setback in Alternative 2 with wider road edge design to accommodate the cycle track.
17	Protect known or potential cultural heritage resources or landscapes	Minimizes impact on existing or known cultural heritage resources or landscapes	●	◕	The employment lands on the west side of the corridor are considered potential cultural heritage resources, however the rural character of the roadway will be preserved. Alternative 2 encroaches on the adjacent lands (Hydro One corridor primarily) to accommodate the multi-use pathway.
18	Protect known or potential archeological resources	Minimizes impact on existing or known archaeological resources	●	◕	Areas of archaeological potential occur along edges of the corridor. Alternative 2 includes a larger construction area footprint and has the potential to uncover more artifacts compared to Alternative 1.
		CRITERIA GROUP SUBTOTAL	◕	◕	
PHYSICAL AND ECOLOGICAL SUSTAINABILITY					
19	Protect terrestrial or aquatic species, protected habitats or linkage corridors	Minimizes direct impact to species or their habitats and linkage corridors	◕	◑	Some tree removals on the west side of the corridor will be required to enable construction. Alternative 2 has a greater construction footprint than alternative 1.
20	Limit risk to human health from areas of known contamination	Minimizes footprint in areas of known contamination (soil or groundwater)	◕	◕	Sites adjacent to the corridor range from low to high risk depending on the historical use of the lands. Differences between the alternatives will be minimal.
21	Limit or reduce contribution to greenhouse gas emissions	Maximizes positive modal shift to walking, cycling and transit versus private automobile use	◑	◕	Alternative 2 provides greater opportunity to maximize walking, cycling, and transit ridership, and that limit automobile capacity, will provide greater incentive for modal shift that in turn would result in lower greenhouse gas emissions.
22		Maximize fuel efficient driving behavior	◑	◕	As neither option provide continuous designated bus lanes, fuel efficiency may be impacted with increased traffic or use of the corridor by cyclists and pedestrians. Alternative 2 provides for better traffic flow as the raised bike lanes prevent cyclists from having to enter traffic to move around buses stopped in the cycling lanes, causing further delay and impact to cars.
23		Minimizes the amount of materials used in construction	●	◕	Alternative 1 requires a larger road area and associated roadbed materials however has less facilities in the boulevard areas.
24	Protect corridor users from the effects of climate change	Reduce or avoid exposure to extreme temperatures or weather events	◕	◕	Alternative 1 will require less removal of existing vegetation. Both alternatives provide opportunities for additional trees. Bus shelters will require room in both alternatives. The MUP in Alternative 2 provides an additional option for cyclists and pedestrians seeking shade by adjacent trees.
25	Protect existing and planned infrastructure from the effects of climate change	Maximizes ability to build in resiliency to infrastructure and reduce future operational costs	◕	◕	As both alternatives offer full roadway reconstruction the opportunity for built in resiliency into the new designs are equal and evident.
		CRITERIA GROUP SUBTOTAL	◕	◕	
ECONOMIC SUSTAINABILITY					
26	Preserve or re-use of existing infrastructure	Minimizes the requirement to relocate existing infrastructure (e.g., water, sewer, and utilities)	◕	◑	Both alternatives preserve hydro infrastructure within their existing alignments. Alternative 2 will require full reconstruction of the existing ditch, whereas alternative 1 requires only modifications.
27	Limit capital construction costs	Minimizes construction costs (infrastructure, complexity)	●	◕	Alternative 2 requires the least materials and footprint for construction.
28	Limit operational costs	Minimizes operations costs	◕	◑	Alternative 2 requires additional maintenance for the multi-use pathway.

CRITERIA		INDICATORS	Alternative 1 TWO LANE ROADWAY WITH DESIGNATED CYCLING LANES	Alternative 2 TWO LANE ROADWAY WITH MUP AND CYCLE TRACK	RATIONALE
29	Provide ability to phase construction	Maximizes opportunities for a phased project	◔	◕	Alternative 2 allows for staging of construction to accommodate pedestrians, cyclists and other mobility users while the roadway is constructed.
30	Limit land requirements	Minimizes property acquisition costs	●	◕	Additional property is required for Alternative 2 for construction of the Multi-Use Pathway in addition to that required at intersections for both alternatives.
		CRITERIA GROUP SUBTOTAL	◑	◕	
		TOTALS ACROSS CRITERIA GROUPS	◑	◕	

5.3.3 Preliminary Preferred Design - Blair Road from Montreal Road to Ogilvie Road

The analysis performed determined that both alternatives scored relatively close on overall category scores. However, Alternative 2, the addition of a designated cycle track and a MUP, was identified as the preliminary preferred design for Blair Road due to the following considerations;

- The use of a MUP which connects to the South of the evaluated section of the corridor provides for increased ability to access all existing lands through use of a singular corridor. This design reduces complexity of travel and allows for ease of use by both pedestrians and cyclists of all ages and abilities.
- The accessibility and safety for pedestrians and those using the space is significantly improved with separated uses such as the raised cycle track, MUP, and the roadway. Due to identical configuration of the travel lanes in these design alternatives, the safety, accessibility and comfort of pedestrians and cyclists utilizing these facilities are determining factors in the evaluation.
- Short term costs and maintenance are increased, however the potential for expansion and intensification of surrounding employment land uses and some residential intensification provides significant long-term potential for growth and prosperity of the area with the improved multi-modal access.
- Although slightly more complicated in design, materials, and multiple components within the cross section, the preliminary preferred alternative increases the overall opportunity for continuation of use during construction.

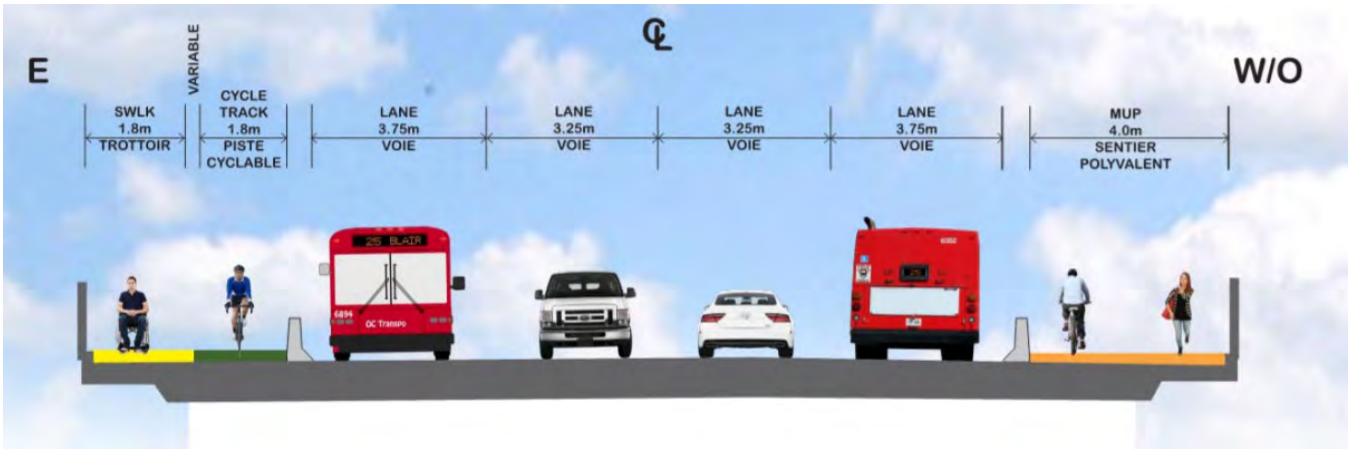
Overall, is it recommended that Alternative 2, with the addition of a Multi-Use Pathway on the west side and designated cycling track separated from the sidewalk on the east side, is the preliminary preferred alternative for this section of the Blair Road Corridor.

5.3.4 Blair Road Transit Priority Widening Environmental Assessment

The Blair Road Widening for Transit Priority – Innes Road to Blair LRT Station, is a Schedule C Municipal Class Environmental Assessment (EA) Study completed by the City with project limits immediately abutting this study's project limits at the intersection of Blair Road and OR174 westbound off-ramp and Gloucester Centre/Blair Station LRT access driveway. This EA was completed to determine the transit, pedestrian, and cycling facilities which best meet the current and future needs of the corridor.

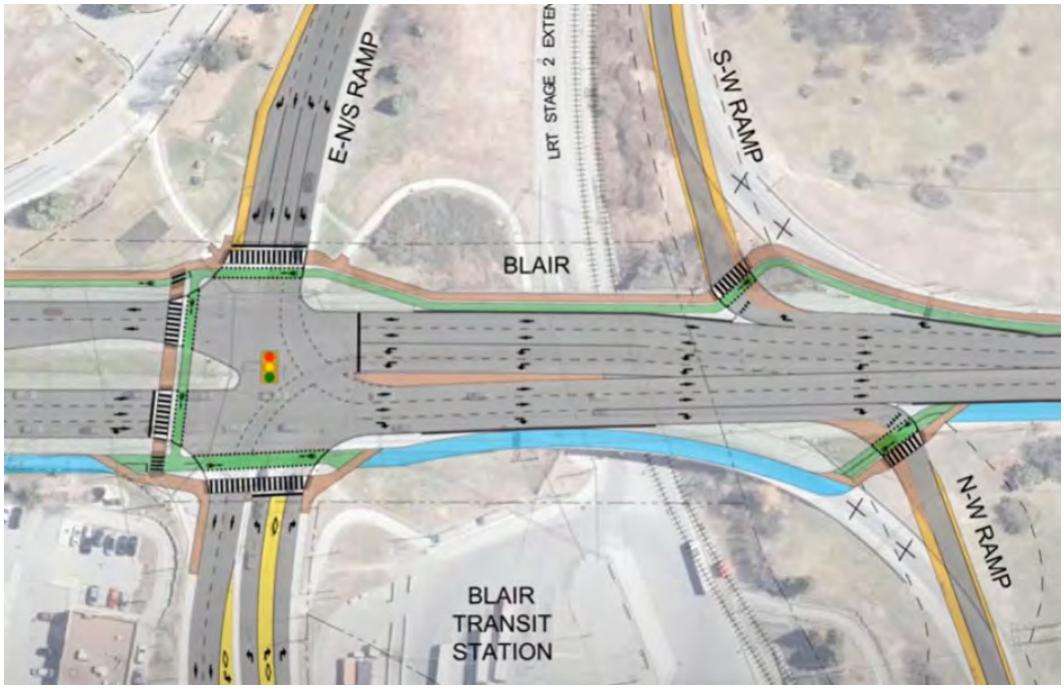
The Recommended Plan for Blair Road which bypasses over OR 174 can be seen in the figure below. This design incorporates a 4-metre Multi Use Pathway along the west side of the roadway, a sidewalk and separated cycle track along the east side, and 2 traffic lanes per direction. The design for these pedestrian and cycling facilities have been harmonized with the Recommended Plan for this study.

Figure 5-8 Blair Road Environmental Assessment Study Recommended Cross Section - Bridge Over Ottawa Road 174



The figure below illustrates the Recommended modifications to the Blair Road/OR 174 eastbound offramp/Gloucester Centre and Blair Station access driveway that considers both pedestrian and cyclist safety through the intersection.

Figure 5-9 Blair Road Environmental Assessment Study Proposed Design - Blair Road Intersections South of Ogilvie Road



The Multi-Use Pathway (blue) is separated into pedestrian (orange) and bi-directional cycling facilities (green) upon approach to the intersection for increased safety. Channelized or separated right hand turn lanes have also been removed at this location. This design was determined to be the most effective for overall traffic flow and pedestrian and cyclist safety along the Blair Road corridor.

5.4 Alternative Designs - Bus Loop

5.4.1 Alternative Design Development

The following section outlines the proposed alternative locations for the Montreal Station bus loop. These alternatives will be described, then evaluated and summarized using the criteria previously outlined in **Section 5.1.1**.

At the future Montreal Station, a new bus loop is needed to support local bus operations as well as future bus network changes expected with the opening of Stage 2 LRT. The bus loop will allow for additional transit services along Montreal Road and nearby communities and improve local bus connections with the LRT. The facility will include turnaround and parking spaces for buses, a facility for bus operators, and landscaping and storm water management features. Four (4) alternative sites were considered for candidate bus turnaround locations for transit utilizing the future Montreal BRT Station (**Figure 5-10**). They are:

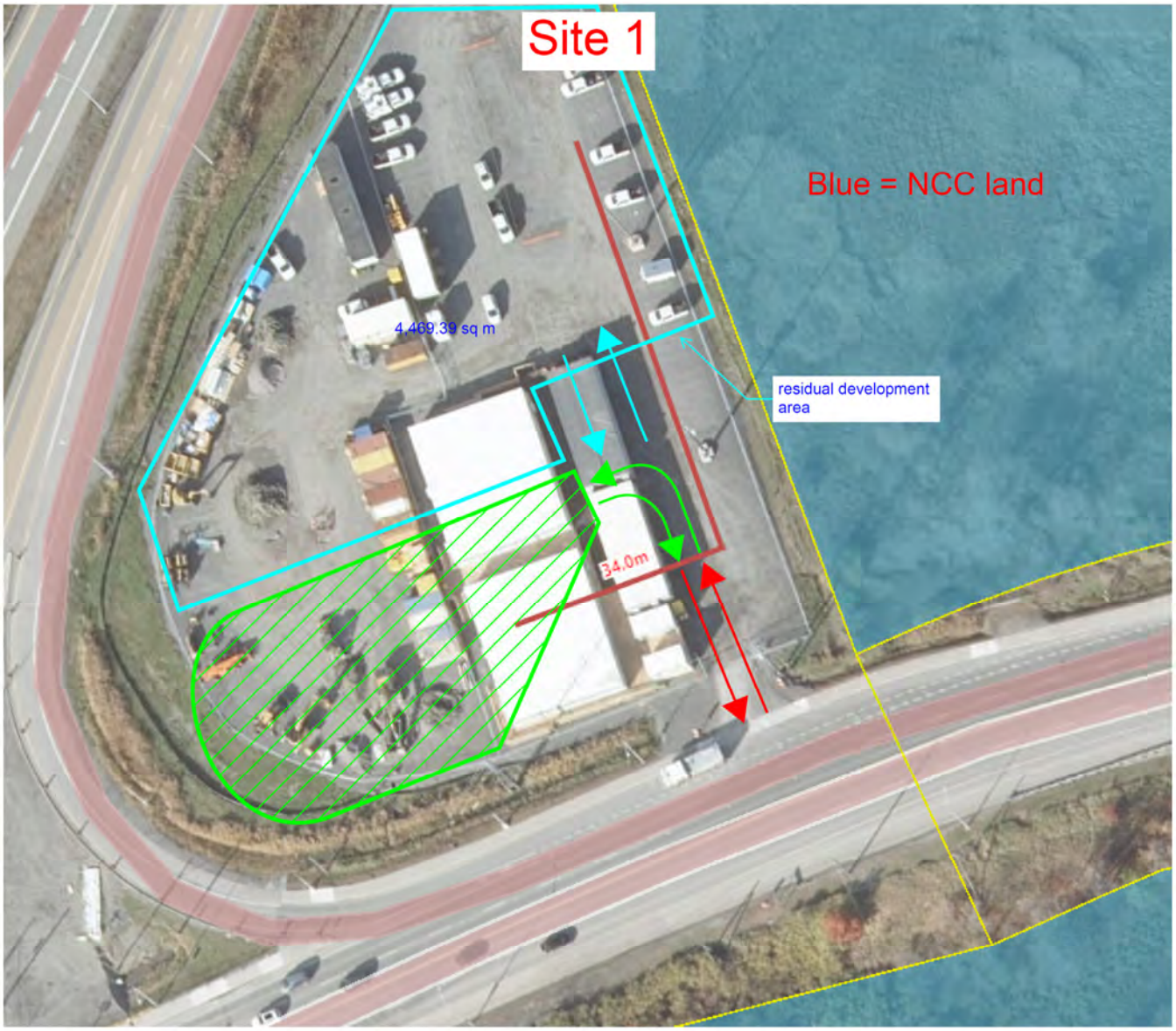
- **Alternative/Site 1:** Located on the north side of Montreal Road, east of the eastbound OR-174 EB on-ramp. Buses would make an EBL into the site and SBR out of the site.
- **Alternative/Site 2:** Located on the south side of Montreal Road, east of the westbound OR-174 EB on-ramp. Buses would make an EBR into the site from Montreal Road and WBL out of the site onto the OR-174 EB off-ramp.
- **Alternative/Site 3:** Located on the north side of St. Joseph Boulevard, approximately 200m east of St. Joseph/Bearbrook intersection. Buses would make an EBL into the site and SBR out of the site.
- **Alternative/Site 4:** The St. Joseph/Bearbrook intersection. The intention would be to convert this intersection into a roundabout so eastbound buses could make a u-turn and continue westbound on St. Joseph Boulevard. This option would also include parking spaces for buses on the north side of St. Joseph Boulevard, west of the St. Joseph Boulevard and Bearbrook Road intersection.

Figure 5-10 Locations of Potential Bus Loops for Evaluation

5.4.1.1 Alternative 1: Existing Staging Area - N/E Corner of Montreal And OR174

The conceptual layout for Alternative 1 is illustrated in **Figure 5-11**.

Figure 5-11 Conceptual Layout for Alternative 1 Bus Loop Location

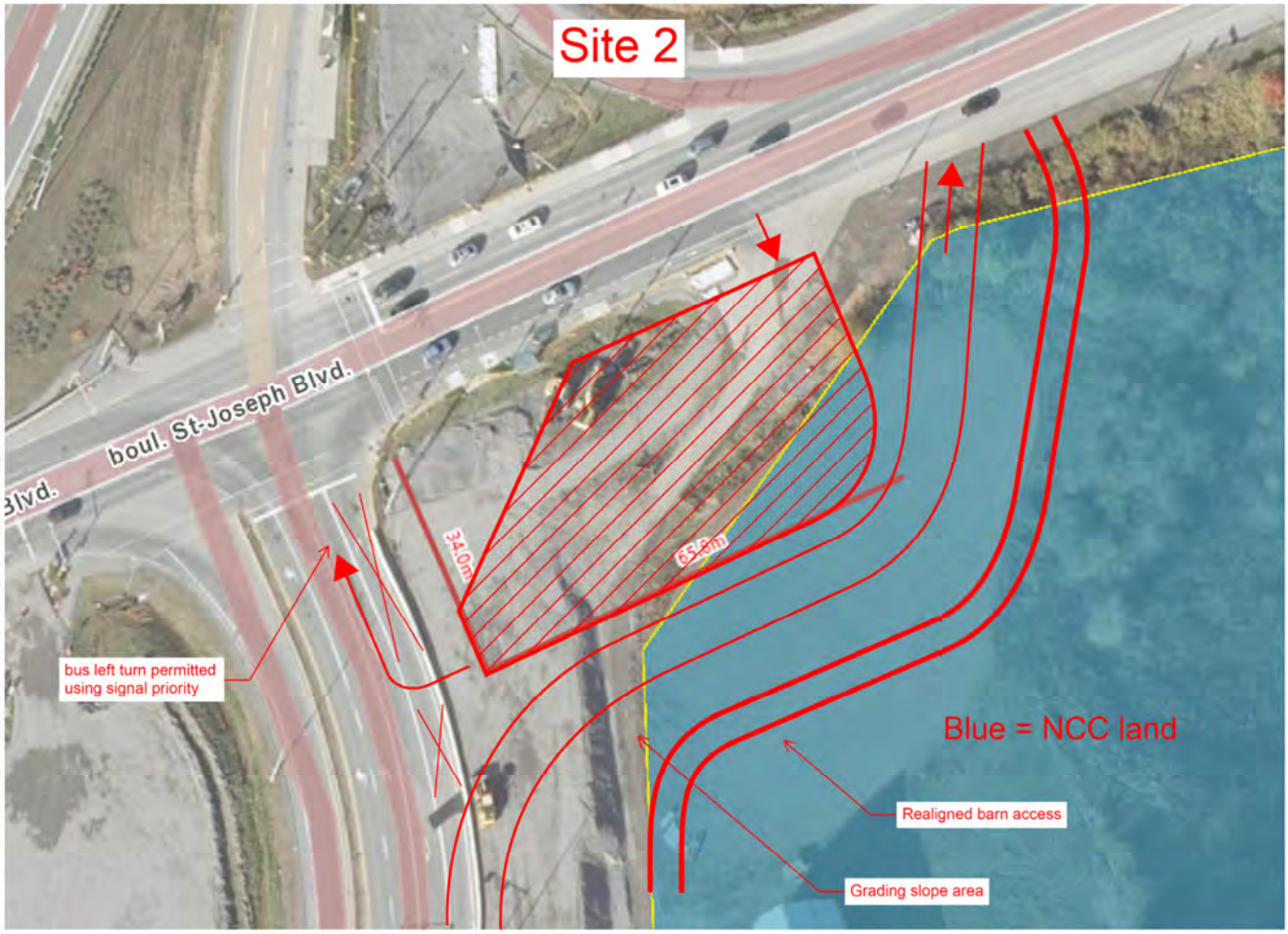


Alternative 1 is a wholly City-owned property that has already been cleared to provide a staging area for the Stage 2 LRT works. The site has been cleared of vegetation and would be essentially construction ready as soon as Stage 2 LRT operations have demobilized. The NCC owns the property adjacent to the east and the eastbound OR174 ramp is located on the other sides of the property. The location is sufficient to provide for the layout of associated bus loop facilities and provides sufficient residual space to consider future adjacent development. Considerations for this site include confirming safe access and signal warrant for bus access as transit vehicles accessing the site will be turning left across two through lanes and a right-turn lane (the OR-174 EB on-ramp) on Montreal Road. With respect to bus egress, OC Transpo egress of site will be directly onto OR-174 EB on-ramp unless this lane is modified or removed. This means that buses leaving the site may need to turn into a right-turn lane and then merge into the adjacent through lane to continue west. In cases where buses/vehicles exiting need to turn left, they must cross three heavily travelled lanes. Because of the heavy east and westbound traffic, there will likely be few available gaps to turn/merge. Alternative 1 is located in the most optimal location from a distance and access/egress perspective for buses as design modifications to accommodate safe operations can be incorporated.

5.4.1.2 Alternative 2: Southeast Corner of Montreal Road and OR 174

The conceptual layout for Alternative 2 is illustrated in **Figure 5-12**.

Figure 5-12 Conceptual Layout for Alternative 2 Bus Loop Location

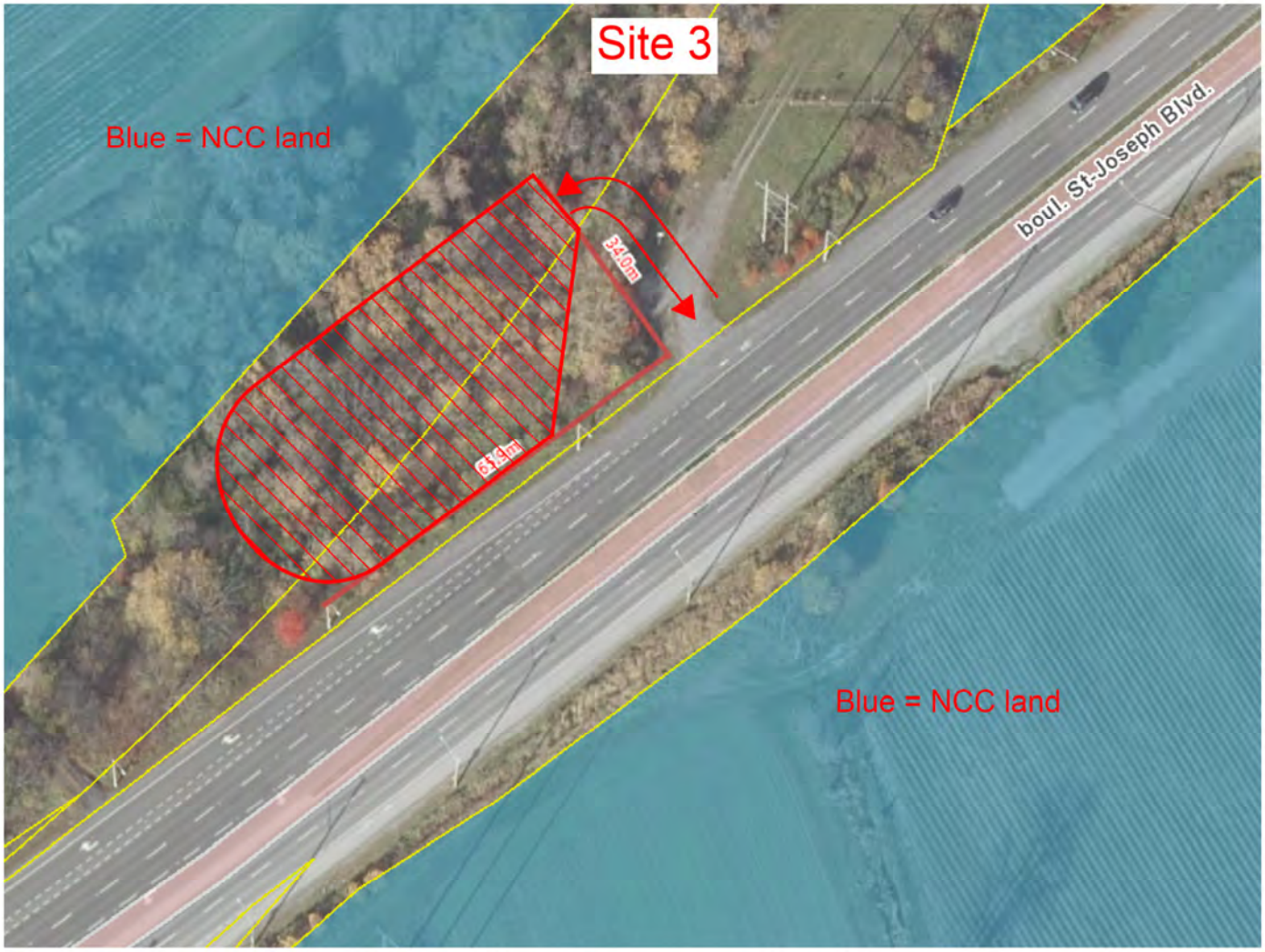


Alternative 2 is a mixture of City-owned and NCC property. NCC property would be required as the footprint of just the City-owned land is not sufficient to accommodate the bus loop and associated facilities. The grading in this area is of significant concern for accommodating the bus loop which would result in greater cost and land requirements. There is also a requirement for vegetation removal on Greenbelt lands and the impact on existing or future land uses, including access to the existing farm and barn structure on NCC lands. The transportation access/egress considerations require significant reconfiguration of adjacent roadways. Bus egress would result in traffic signal challenges and is less desirable for safety and geometry perspectives. Detailed traffic analysis results show NBT queue length is not expected to extend past turnaround exit, thereby allowing gaps for buses leaving the site. The other transportation concern with this site is the northbound right turning general traffic has the potential to block buses exiting the turnaround. This option includes a notable channelized right turn configuration that would route general purpose right-turning traffic east of the site so as to bypass the Montreal/OR174 existing off-ramp intersection completely. Alternative 2 is located in the most optimal location from a distance and access (not egress) perspective for buses.

5.4.1.3 Alternative 3: Adjacent To St. Joseph - ~400m East Of Bearbrook/Sir George-Etienne Cartier Parkway

The conceptual layout for Alternative 3 is illustrated in **Figure 5-13**.

Figure 5-13 Conceptual Layout for Alternative 3 Bus Loop Location



Alternative 3 is located within the Hydro One corridor, NCC lands and some City-owned lands. There are concerns regarding the required shared use with Hydro One lands as well as disruption and impacts to the operating orchard. This site is also located within the NCC Greenbelt and conflicts with existing land use. The distance from this alternative location to future Montreal BRT Station is another issue with this location. The distance from site to station is approximately 900m in one direction and as buses need to travel 1.8km total to turn around. It is estimated this would result in 2 to 2.5 minutes travel time westbound from Site 3 to reach the station (4-5 min round trip). It should be noted that this approximation does not take into account days where extreme incidents may occur causing this travel time to be much larger (e.g. inclement weather, downstream intersection queueing spilling past site entrance, etc.).

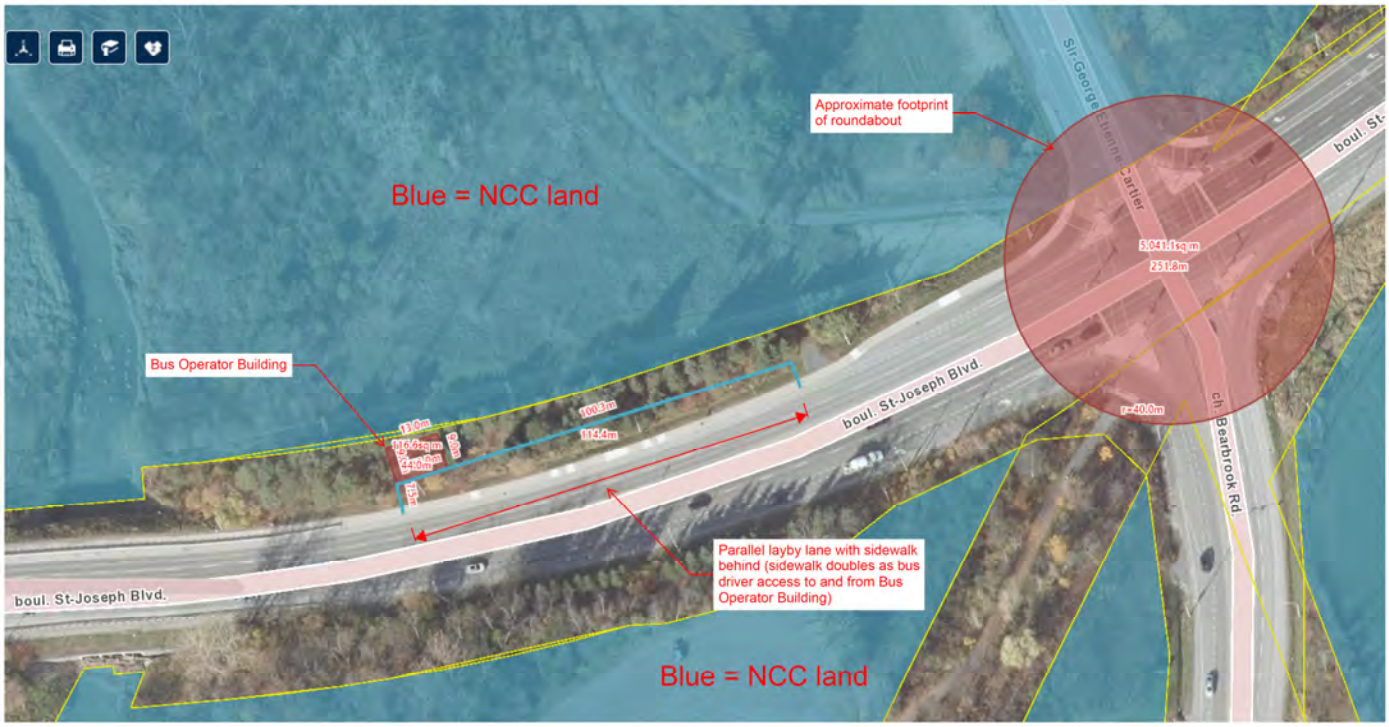
There are a few transportation concerns related to this alternative location for the bus loop. With respect to bus access there is a safety/delay of vehicles turning left into site across St. Joseph Boulevard. A signal is not warranted due to low site traffic. Locating the bus loop at this location satisfies a warrant for an auxiliary left-turn lane into the site (i.e., eastbound left-turn lane recommended on Montreal Road). Vehicles accessing the site will be turning left across two through lanes. Should buses/vehicles exiting site need to turn left they must cross two heavily travelled lanes which could cause delays and safety concerns.

With respect to bus egress, should buses/vehicles exiting need to turn left, they must cross two heavily travelled lanes which could cause delays and safety concerns. Heavy east and westbound traffic will likely result in few gaps for buses leaving the site which could further exacerbate the delays and safety concerns.

5.4.1.4 Alternative 4: North Side Of St. Joseph Boulevard, West Of The St. Joseph Boulevard and Bearbrook Road Intersection (Also Requires New Roundabout At St. Joseph And Bearbrook Intersection)

The conceptual layout for Alternative 4 is illustrated in **Figure 5-14**.

Figure 5-14 Conceptual Layout for Alternative 4 Bus Loop Location



Alternative 4 is the north side of St. Joseph Boulevard, west of the St. Joseph Boulevard and Bearbrook Road intersection; this option would also require converting the existing St. Joseph and Bearbrook signalized intersection into a multi-lane roundabout. The distance from the Montreal LRT Station is a concern and would result in increased transit operation costs and greenhouse gas emissions. The bus layby area would be in the form of a 'bus parking bay'. Public sidewalks would double as access routes to bus operator building. The existing bike lane could be converted to cycle track for length of bus layby to minimize bus/cyclist conflicts. There are significant grading challenges and retaining walls needed to construct this alternative. There would be impacts to the Greenbelt and requirement for vegetation removal to accommodate the roundabout. There are also transportation concerns related to this alternative location. The feasibility of a roundabout is of concern. Based on the *Roundabout Feasibility Screening Tool*, a roundabout at this location has merit based on existing capacity issues and traffic signal warrants, however, a number of contra-indicators have been identified in the Screening Tool including:

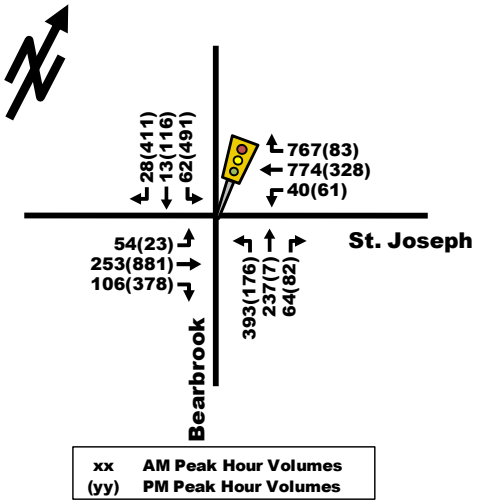
- potential property constraints to the north;
- potential issues with approach grades and satisfactory stopping sight distances, which would need to be confirmed; and
- the difference in directional flows between EB/WB and NB/SB movements (i.e., imbalanced flows).

The far distance from Alternative 4 to future Montreal BRT Station is approximately 675m in one direction and as such, buses need to travel 1.4km total to turn around which is less than ideal as it causes unnecessary wear and tear on the buses. Further, it is estimated 1.5 to 2 minutes travel time westbound from the intersection to reach the station (3-4 min round trip) is added. It should be noted that this approximation does not take into account days where extreme incidents may occur causing this travel time to be much larger (e.g. inclement weather, downstream intersection queueing spilling past site entrance, etc.).

Another transportation concern is the distance between the proposed roundabout and the signalized Montreal-St. Joseph/OR174 EB off-ramp intersection. The distance between intersections is approximately 600m. Traffic analysis indicates a projected 95th percentile westbound queues at the Montreal-St. Joseph/OR174 EB Off Ramp intersection are approximately 200m. it should be noted that this projected queue length does not account for queue spillback from intersections downstream of the OR-174.

Finally, the intersection performance as a roundabout is of concern (**Figure 5-15**).

Figure 5-15 Intersection performance as a roundabout for Montreal-St. Joseph



Traffic analysis results indicate that a basic multi-lane roundabout performs poorly with an overall LoS 'F' during peak hours due to many heavy movements. This considers:

- 2 approach lanes EB/WB and 1 approach lane NB/SB
- No auxiliary slip lanes

Illustrative layout only:

An enhanced multi-lane roundabout performs well with an overall LoS 'B' to 'C' during peak hours. This considers:

- 2 approach lanes EB/WB/NB and 1 approach lane SB
- EBR, WBR, SBR slip lanes
- Providing dual lanes to accommodate the northbound left-turn movement
- It should be noted that by introducing 1 slip lane it triggers the need for others. For example, the addition of the SBR slip lane improves the flow of the SBT/L movements causing the EB movement to yield, which results in increased delays and poorer performance.

Illustrative layout only:

5.4.2 Evaluation of Alternative Designs - Bus Loop

The evaluation of Bus loop Alternatives is provided in **Table 5-5.** The detailed evaluation reveals that overall, the preferred site for the bus loop is Alternative 1. A discussion of the evaluation results is included below.

Table 5-5 Evaluation of Alternative Sites for Montreal Station Bus Loop

CRITERIA		INDICATORS	Alternative 1 EXISTING STAGING AREA - N/E CORNER OF MONTREAL AND OR 174	Alternative 2 S/E CORNER OF MONTREAL AND OR 174	Alternative 3 ADJACENT TO ST. JOSEPH - ~400M EAST OF BEARBROOK/SIR GEORGE-ETIENNE CARTIER PKWY	Alternative 4 NORTH SIDE OF ST. JOSEPH BOULEVARD, WEST OF THE ST. JOSEPH BOULEVARD AND BEARBROOK ROAD INTERSECTION	RATIONALE
TRANSPORTATION SYSTEM SUSTAINABILITY							
1	Pursue pedestrian safety and comfort	Minimizes conflicts between pedestrian movements and other modes and reduces risk of serious injuries	◕	●	●	◑	For alternative 1, buses must cross an existing sidewalk, however, can be mitigated with proper access design. Access to Alternative 2 and 3 will not cross a sidewalk (there is currently no existing sidewalk here). Alternative 4 may introduce conflicts between sidewalk users and buses/operators.
2	Pursue cyclist safety and comfort	Minimizes conflicts between cyclist movements and other modes and reduces risk of serious injuries	◕	◕	◕	◑	Alternatives 1-3 require buses to cross an existing bike lane which can be mitigated with proper access design. Alternative 4 will be located adjacent to bike lanes and introduce potential conflicts at roundabout.
3	Maximizes transit efficiency	Provides adequate left and right turn accessibility.	◕	◔	●	◔	Alternative 3 is slightly better but both alternative 1 and 3 maximize accessibility to/from Montreal LRT Station bus stop without requiring traffic signals, although left turn lane would be required. Alternative 1 is the most optimal location from a distance and access/egress perspective for buses. Alternative 2 will require Traffic signals for left turn on exit towards LRT bus stop, and proximity to existing OR174 off ramp and existing signals is problematic. Alternative 4 is on-street and does not require turns, but can only be accessed from WB direction.
4		Provides a location that easily distinguishes bus loop entrances and exits to prevent general traffic from entering	◕	◕	●	◔	Alternative 3 is slightly better as Bus loop entrance can be made distinct and distinguishable, median provides enhanced signage opportunity. Alternative 1 and 2 do not have the ability to retain the median. Alternative 4 has greatest potential for general traffic to access as it is located on-street.
5		Provide adequate space for bus lay-by area and bus circulation	●	◕	◕	◔	Alternatives 2 and 3 provide sufficient space. Alternative 1 provides more space than required, which can be utilized for other uses. Alternative 4 provides limited space and no ability for re-circulation of buses.
6		Minimizes distance from planned LRT bus stop location to proposed bus loop	●	●	◔	◑	Alterntaives 1 and 2 provide the bus loop as close as practical. Alternatives 3 and 4 are a notable distance from bus stop.
7		Maximizes access to all directions of travel from bus loop to highway/major arterials/travel lanes	◑	◑	◑	◔	Alternatives 1-3 are equally accessible to/from all directions. Traffic signals not warranted but eastbound left-turn bus movements into Sites 1 and 3 face heavy opposing (westbound) volumes. Alternative 4 is only accessible from WB lanes and requires EB buses to make a u-turn at new roundabout to access.
8		Supports proposed bus route network and operating requirements	●	◔	◕	◔	Alternatives 1 and 3 support proposed routing, however alternative 3 is much further from Montreal Station. Alternative 2 exit to the west is problematic and requires relocation of OR174 off ramp, new signal and complex operational manouvers. Alternative 4 no exit to east is possible.
9	Minimizes disruption to existing general purpose traffic	Minimizes additional delay to general purpose traffic.	◕	◔	◕	◕	Delay from Alternatives 1 and 3 can be minimized by adding a left turn lane for buses to access the bus loop. Alternative 2 will require a traffic signal to be added and this would delay general purpose traffic. Alternative 4 will not introduce delay but requires a new roundabout with additional ancillary lanes to operate acceptably.
10	Pursue road safety and comfort	Maximizes the opportunity to incorporate road safety objectives such as: minimizes speed differential, provides most acceptable intersection spacing, manages existing roadside hazards/doesn't introduce new roadside hazards and doesn't introduce queuing and storage issues.	◕	◔	◕	◑	Alternatives 1 and 3 support designing to best practices for safety. Alternative 2 requires traffic signal close to existing signal or modification of existing signal to unconventional configuration. Alternative 4 requires a new large roundabout at the St. Joseph/Bearbrook intersection.
		Criteria Group Subtotal	●	◑	●	◔	
LAND USE, SOCIAL AND COMMUNITY SUSTAINABILITY							
11	Be compatible with existing or planned land uses	Supports existing or future land uses, avoids fragmentation of land uses.	◑	◔	◔	◔	Alternatives 2, 3 and 4 would conflict with existing land use and would require land transfer from others. Alternative 3 would negatively impact a fruit farm and the shared use with Hydro One is uncertain if compatible. Residual space on Alternative 1 is available for future uses.
12	Ensure health, safety, security, and comfort of employees	Location is in an area of high visibility	●	●	◕	◕	Alternatives 3 and 4 are located in more isolated locations.

13		Maximizes opportunity/space for user amenities such as washrooms and rest areas.	●	◕	◕	◕	Alternative 1 has the most flexibility for the location and size of amenities. . Sufficient space for alternatives 2, 3 and 4.
14	Protect against noise and vibration effects	Maximizes distance between facility and sensitive receivers	●	●	◔	◑	Alternatives 1 and 2 located over 300m from closest sensitive receiver. Alternative 3 is partially located within 1367 St. Joseph Blvd a Montessori school. Alternative 4 is close to the school as well.
15	Protect known or potential cultural heritage resources or landscapes	Minimizes impact on known or potential cultural heritage resources or landscapes	●	●	◔	●	Alternatives 1, 2 and 4 have no anticipated impacts. Alternative 3 is partially located within 1367 St. Joseph Blvd a protected heritage property and adjacent to listed heritage property
16	Protect known or potential archeological resources	Minimizes impact on known or potential archaeological resources	●	◕	◑	◑	Alternative 1 has been completely cleared during LRT preparations. Alternatives 3 and 4 have archaeological potential. Alternative 2 most of site has stage 2 completed for LRT works and cleared of further AA requirements; some stage 2 AA still required for unassessed areas.
		Criteria Group Subtotal	●	◕	◔	◑	
Physical and Ecological Sustainability							
17	Reduce loss of or impact to environmentally sensitive land uses or designated green spaces	Minimizes impacts to designated Greenbelt/NCC lands or other naturalized areas.	●	◑	◔	◔	Alternative 1 is completely clear of anything sensitive. Alternatives 2 and 3 would have negative impacts to the Greenbelt. Alternative 4 may have a negative impact to the Greenbelt. Alternative 2 is close to the conservation authority regulation limit which adds complexity. Alternatives 2, 3 and 4 pose grading challenges.
18	Protect terrestrial or aquatic species, protected habitats or linkage corridors	Minimizes direct impact to species or their habitats including linkage corridors and urban trees.	●	◑	◑	◑	Alternatives 2, 3 and 4 require vegetation clearing that may or may not restrict development. Alternative 1 is completely clear of natural vegetation and habitat.
19	Limit risk to human health from areas of known contamination	Minimizes footprint in areas of known contamination (soil or groundwater)	◕	◑	◔	◑	Alternatives 2, 3 and 4 will require clean up prior to development. Alternative 3 has known high risk contamination present. Alternative 1 was cleaned as part of initial site clearing process.
20	Minimizes stormwater management complexity and maintenance	Maximizes the opportunity to adopt enhanced stormwater management techniques. Minimizes impervious areas which create more runoff.	●	◑	◑	◑	Alternatives 2 and 3 have watercourses that are within the sites which would require additional stormwater management. No perceived conflict with Alternative 1. Alternative 4 would result in impacts to existing stormwater infrastructure.
21	Limit or reduce contribution to greenhouse gas emissions	Minimizes conflict between existing general traffic lanes and entrance and exits to bus turnaround to reduce congestion and promote efficient driving	◕	◑	◑	◑	Alternative 1 results in the least amount of idling and congestion due to its proximity to the station. Alternative 2 requires a signal which will increase the amount of idling. Alternatives 3 and 4 are furthest away which adds to overall travel and added emissions.
		Criteria Group Subtotal	●	◑	◔	◑	
ECONOMIC SUSTAINABILITY							
22	Preserve or re-use of existing infrastructure	Minimizes the requirement to relocate existing infrastructure (e.g., water, sewer, and utilities) and maximizes re-use of existing infrastructure.	◕	◔	◑	◔	Alternatives 2 and 3 conflict with existing hydro infrastructure. Alternative 2 and 4 conflict with piped infrastructure.
23	Limit capital construction costs	Minimizes costs associated with construction duration and complexity	●	◑	◑	◔	Costs are significantly lowest for Alternative 1 given that it is already cleared. Alternatives 2 and 3 are generally less desirable as they are not prepared and a bus loop is not consistent with existing land use. Alternative 4 would be the most expensive.
24	Limit life cycle costs	Minimizes infrastructure operation and maintenance costs	◕	◕	◑	◑	Alternatives furthest away from the LRT station will cost more over time.
25	Limit land requirements	Minimizes property acquisition costs	◕	◑	◑	◑	Alternative 1 is completely City-owned. All other alternatives require land from others which adds cost and complexity. Alternative 2 has notable grade raise requirements as well as a partial relocation of OR174 off ramp which increase cost and land requirement
		Criteria Group Subtotal	◕	◑	◑	◔	
		Totals Across Criteria Groups	●	◑	◑	◔	

5.4.3 Preliminary Preferred Design - Bus Loop

The new bus loop will be located at the location of Alternative 1, in the Northeast corner of the St. Joseph Boulevard and OR174 interchange. The site shown on **Figure 5-16** is entirely on City-owned land and is not within the NCC Greenbelt. It is an optimal location given it is just east of Montreal Station, has effective access/egress opportunity for buses and no additional property is required for implementation.

Figure 5-16 Preliminary Recommended Location for Bus Loop

The bus loop will require the following modifications on St. Joseph Boulevard:

- New eastbound left turn lane to assist buses with accessing the bus loop;
- Shorter westbound right turn lane to OR 174 on-ramp to reduce conflicts between turning buses and westbound traffic; and,
- New cycle track and sidewalk on the north side, adjacent to the bus loop.

This design will tie in with the planned cycling connectivity improvements along St. Joseph Boulevard, between Montreal Station and Bearbrook Road, to be constructed as part of the Stage 2 O-Train project.

The bus loop will be designed to retain flexibility to accommodate the potential for further development of the site which may include development that incorporates the bus loop into its design and of air rights over the bus loop itself. A shared access for buses and future development will likely be needed given existing roadway geometry and related site constraints.

5.5 Stakeholder Consultation

5.5.1 Third Round of Consultation Group Meetings

The third round of Consultation Group meetings consisted of, one ACG, BCG and PCG meeting and a Public Open House. The Consultation Group meetings provided the opportunity for the Study Team to further develop and refine the preliminary preferred design.

The Study Team, including members from the City of Ottawa and the consultant team, were available to discuss the project and answer questions in an open-discussion format. At these meetings, participants were presented information

that was to be communicated at the second POH including the preferred solution, the design alternatives, evaluation methodology and criteria and the preliminary preferred designs for Montreal and Blair Roads and the Bus Loop. Input received at these meetings included discussion on the following topics:

- Opportunity for space reallocation vs. widening;
- Key desire lines for the active transportation network;
- Concerns regarding accessibility for multi-use pathway users. Segregation of cyclists and pedestrians is preferred from an accessibility perspective;
- Whether a road safety audit was going to be conducted during this phase of the project;
- Montreal Road bridge over the NRC campus modifications or replacement;
- Opportunities to improve the geometry of private driveway accesses and pedestrian and cycling safety throughout the corridor;
- Overall property impacts resulting from the project;
- Project timing and funding;
- Complete street design elements, public realm enhancements and accessibility;
- Consideration for the aging population in the area and optimizing their safety using the corridor; and
- Consideration for winter maintenance.

For a full account of discussion from these consultation group meetings, refer to Error! Reference source not found..

5.5.2 Public Open House #2

Due to the public health guidelines for COVID-19, the second and final public open house was arranged online for a period May 17 - June 11, 2021. For this event, a recorded presentation along with information boards were provided in English and French on the study's website for stakeholders' review. Stakeholders were encouraged to provide feedback on the information presented by June 11 by filing out the available comment-questionnaire.

The material presented on the display boards for the online public consultation event included:

- Introduction
- Study Objectives
- What is Transit Priority
- Environmental Assessment Process and Schedule
- Consultation Activities
- What We've Heard so Far
- Project Need and Opportunity and Accessibility in the Design
- Transit Network Integration
- Identifying the Preferred Solution
- Planning Objectives and Evaluation Criteria
- Alternative Designs - Montreal Road
- Alternative Design - Blair Road
- Montreal Station Bus Loop
- Blair Road North of Montreal Road
- Preliminary Preferred Design Montreal Road - St. Laurent Boulevard to Shefford Road
- Preliminary Preferred Design Blair Road - South of Montreal Road
- Complete Street Approach
- Project Benefits
- Urban Design and Placemaking
- Project Impacts and Mitigation Measures and Implementation and Phasing
- Property Acquisition Processes
- Property Implications
- Next Steps

Notification of the consultation period occurred through a variety of means. Email reminders were sent on three occasions to the project stakeholder list including Indigenous Communities on Tuesday May 18 & 19 2021. Buckslips were mailed out for portions of the Study Area, and notices were mailed to landowners adjacent to Montreal and Blair Roads. Notice was posted to the project website and social media. Advertisements were also placed in citywide newspapers, specifically in the Ottawa Citizen and LeDroit on May 15, 2021 and May 22, 2021.

To assist with obtaining feedback on the materials presented, a comment-questionnaire was provided on the study's website. Alternatively, emails could be submitted, or the City project manager could be contacted to arrange other means of providing feedback. A total of 52 comment-questionnaires received, 19 phone calls and approximately 48 emails received. A number of key themes were repeated from the comments received from the consultation group meetings. Key themes received from this round of consultation includes:

- Property impacts;
- Safety concerns;
- Concerns for noise impacts;
- Support for improving transit service/accessibility;
- Concern about possible tree removal/loss of greenspace;
- Not sufficient active transportation facilities; and
- Privacy concerns.

For a full record of all comments received during this round of consultation, refer to Error! Reference source not found..

6.0 RECOMMENDED PLAN AND ASSESSMENT

This section of the ESR describes the Recommended Plan for the Montreal and Blair Road Transit Priority Corridor project, which encompasses all elements required to support design, construction and operation and implementation. An impact assessment follows the description of the Recommended Plan including recommended mitigation and monitoring measures as required.

Should any changes be made in subsequent design phases that are inconsistent with this final description and change any potential impacts of the project, the proponent will be subject to the addendum process and subject to MECP approval. The proponent will, as per the regulation, be required to complete either an addendum, or a revised ESR. This process is described in full detail in **Section 8.7**.

6.1 Recommended Plan Overview

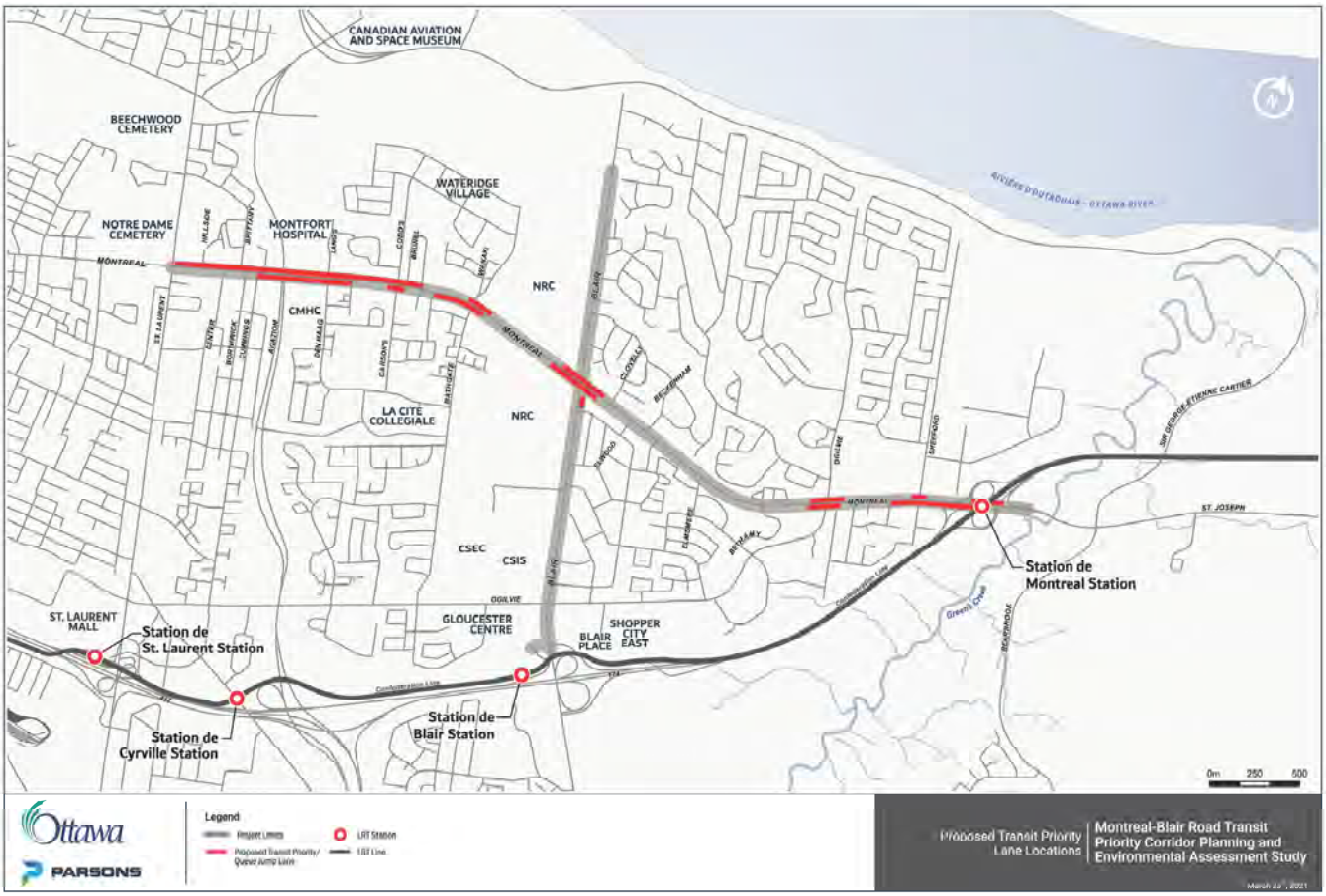
Development of the Recommended Plan was based on the preferred design alternatives identified in **Section 5.0** of this ESR and consists of the major elements outlined below. **Figure 6-1** illustrates the planned transit priority features within the project limits. The recommended plan includes the following key benefits:

- Provide transit priority measures on Montreal Road and Blair Road;
  - Implement sections of bus-only lanes and queue jump lanes.
  - Support new bus routes and services.
  - Improve bus stop locations and amenities.
- Improve multi-modal connectivity to Blair and Montreal stations, as well as to adjacent communities, employment centres and commercial uses;
- Implement the Complete Streets design and improve active transportation facilities by providing new segregated cycle tracks, improved sidewalks and a new multi-use pathway;
- Implement the protected intersection design;
- Provide barrier-free access for all users and implement accessibility design standards;
- Improve road safety for all users;
- Maintain existing roadway capacity;
- Expand public realm and placemaking opportunities that include tree planting and landscaping;
- Consider and incorporate climate change mitigation and adaptation strategies; and,
- Encourage transit-oriented development and regeneration.

The recommended plan also includes the preferred location for a new bus loop and bus lay-up facility to support integration with the Stage 2 Montreal O-Train Station, enhance local bus operations and support future bus network changes.

Implementation of the project will require approximately 1.95 hectares of private and public property.

Figure 6-1 Recommended Plan Overview



6.2 Recommended Design

This section provides a more detailed description of the project elements, including alignment, cross-section, bus shelter and corridor elements. Functional design drawings (plates) illustrating all features including property necessary to support the project are included in **Section 7.0**.

The transit priority elements are broadly illustrated in **Figure 6-1.** The Recommended Plan has been advanced to a functional level of design, which permits identification of infrastructure footprint, property requirements, project impacts, and cost estimates which can be evaluated as part of the assessment of effects, with appropriate mitigation measures developed where necessary.

6.2.1 Montreal Road

The recommended plan for Montreal Road will result in new transit priority measures that will add segments of continuous curb-side bus lanes, as well as shorter "queue jump" bus lanes at key locations. Combined with transit signal priority at intersections, this plan identifies measures where they are most needed to meet the future 2046 travel demand projections. Transit priority lanes will be shared with right-turning vehicles in some locations to minimize ROW requirements and property impacts. The recommended measures will provide a similar level of service as continuous bus lanes and will address projected transit ridership of approximately 500 riders per hour. Implementation of the recommended plan will result in travel time benefits, support new bus routes and services, and improve bus stop amenities throughout the corridor.

The transit priority lanes on Montreal Road will be provided at the following locations:

Eastbound:

- From Aviation Parkway to Den Haag Drive (500 metres);

- At Codd's Road (queue jump); and,
- From Shefford Road to Montreal Station (500 metres).

Westbound:

- At Shefford Road (queue jump); and,
- From Codd's Road to St. Laurent Boulevard (1.4 kilometres).

The queue jump lanes will be provided in both directions at:

- Bathgate Drive;
- Blair Road; and,
- Ogilvie Road.

The recommended plan will also improve active transportation facilities along the entire corridor. The Complete Streets and road safety-related modifications include:

- Continuous 1.8-metre cycle track and 2.5metre-wide sidewalk on both sides;
- Protected intersections;
- Additional accessibility design features, such as improved passenger loading areas, tactile walking surface indicators, unobstructed sidewalks and smooth ground and floor surfaces, and resting areas;
- Improved connectivity to north-south cycling spine routes and pathways;
- Advanced pedestrian and cycling phase and protected left turn phase at intersections;
- Removal of right turn channels and right turn lanes where they are not required; and,
- Improved geometry of some driveway access (reducing lengths of depressed curbs, tightening the radius to driveway access and ensuring they are perpendicular to the roadway).

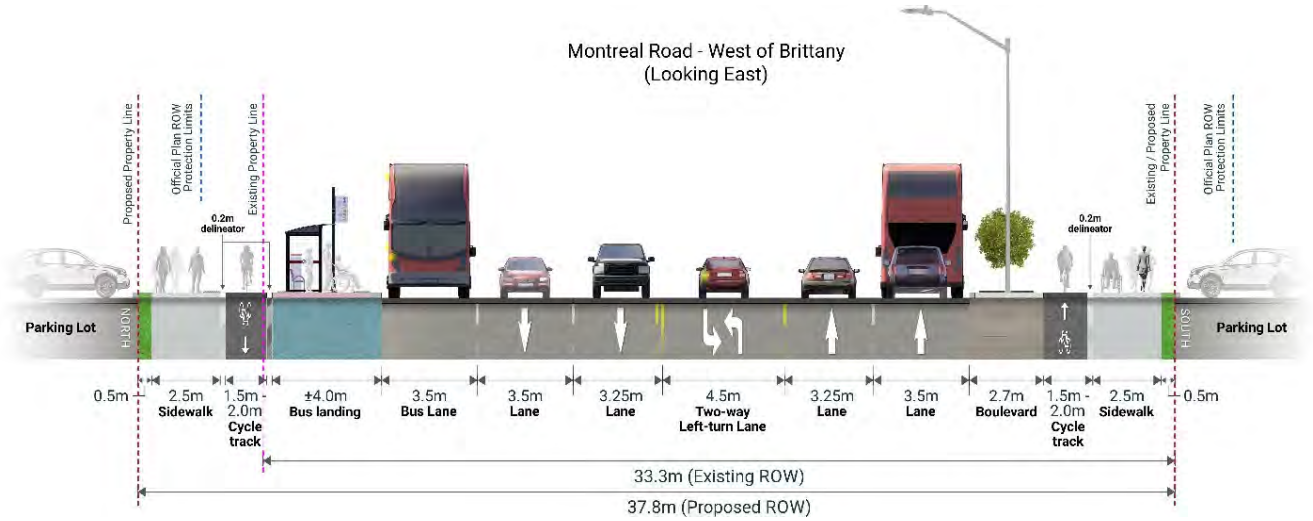
The general-purpose vehicle capacity will remain the same as it is today (two lanes in each direction).

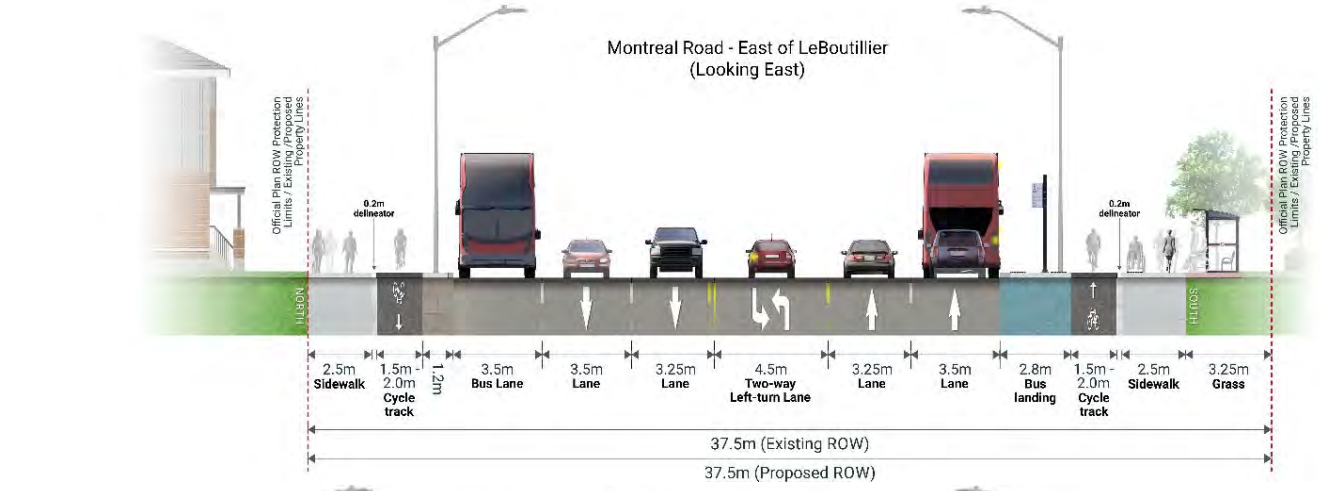
The recommended plan includes new cycle tracks and wider sidewalks on the Montreal Road bridge over the National Research Council, just west of Blair Road. This will require widening or replacement of the bridge, which will be decided based on the condition of the bridge at the time of project implementation. The bridge was built in 1986 and is in good overall condition. The ultimate timing of bridge renewal will depend on future project prioritization and funding availability.

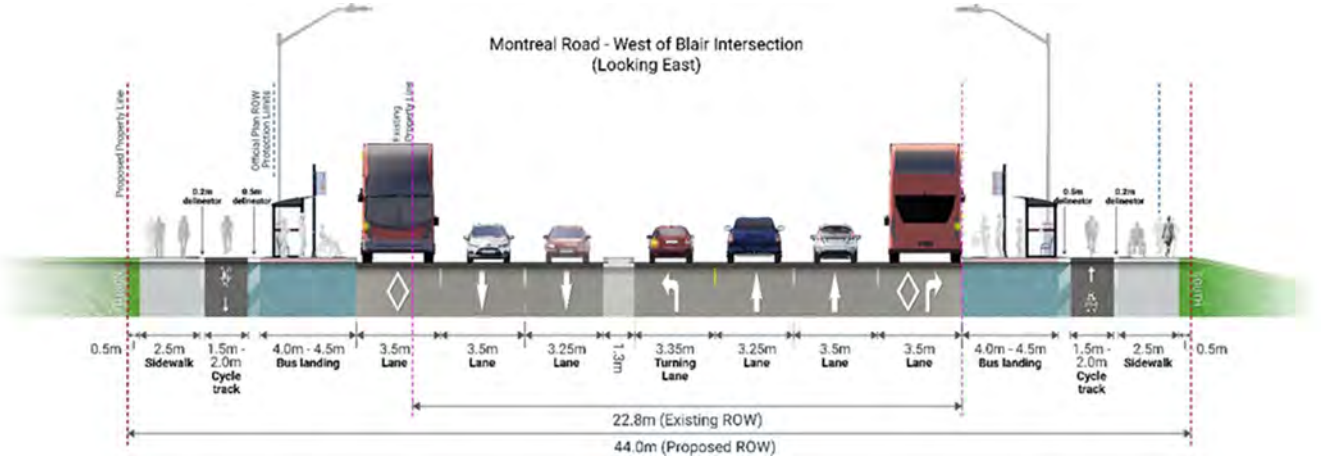
Most of the property requirements can be accommodated within the OP protected ROW of 37.5 metres. Some properties will be impacted where the existing ROW is less than that, as well as where additional widening is required to implement the plan, including at some intersections.

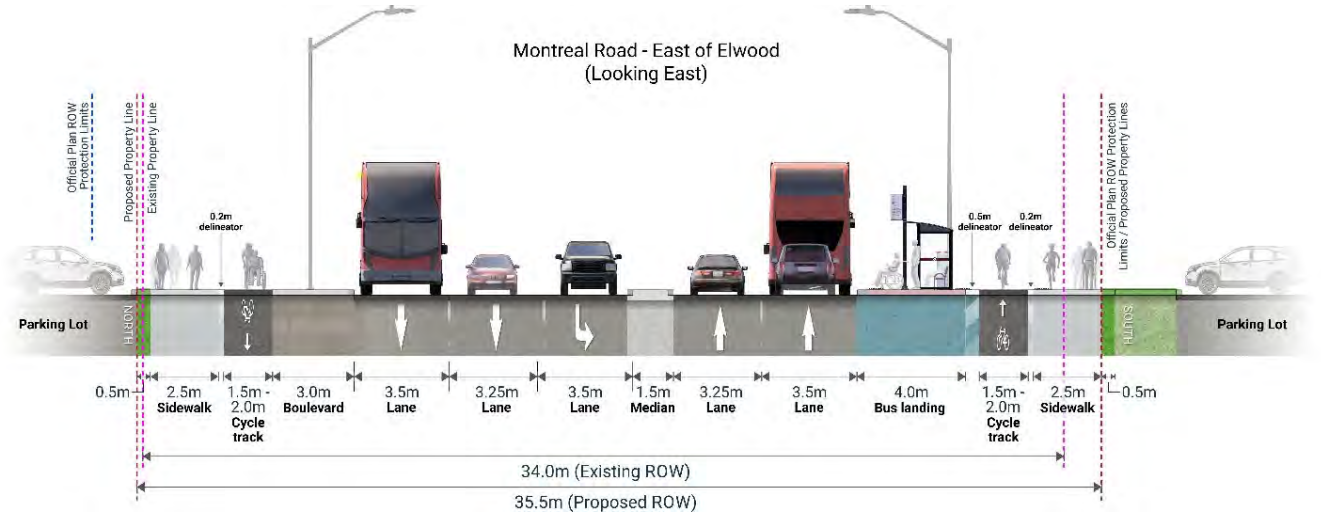
The representative cross-sections of the Montreal Road recommended plan are shown below.

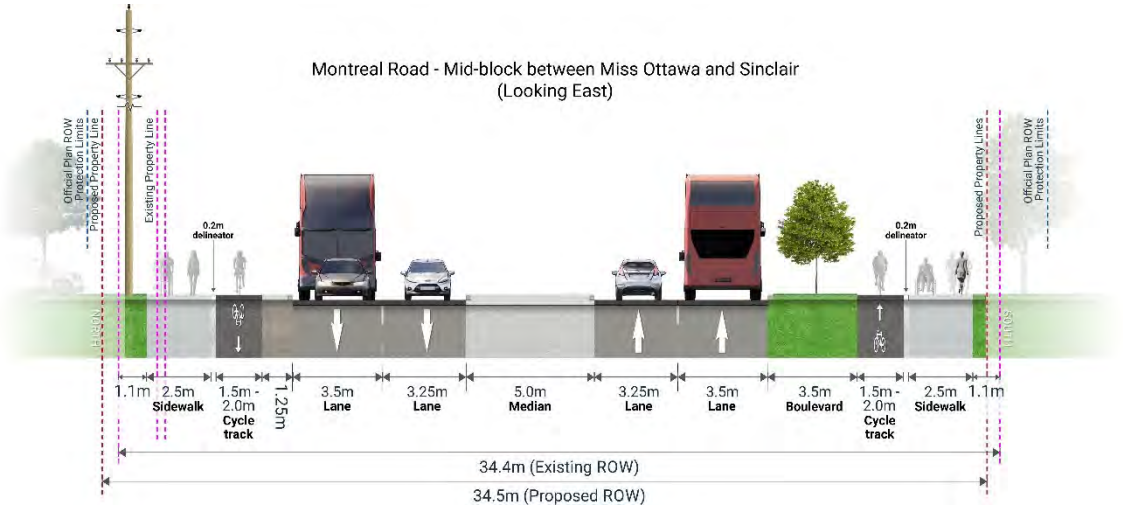
Figure 6-2 Representative cross-sections on Montreal Road




Montreal Road - East of LeBoutillier
(Looking East)
Official Plan ROW Protection Limits / Existing / Proposed Property Lines
0.2m delineator
NORTH
SOUTH
2.5m Sidewalk
1.5m - 2.0m Cycle track
1.2m
3.5m Bus Lane
3.5m Lane
3.25m Lane
4.5m Two-way Left-turn Lane
3.25m Lane
3.5m Lane
2.8m Bus landing
1.5m - 2.0m Cycle track
2.5m Sidewalk
3.25m Grass
37.5m (Existing ROW)
37.5m (Proposed ROW)


Montreal Road - West of Blair Intersection
(Looking East)
Proposed Property Line
Official Plan ROW Protection Limits
0.2m delineator
0.5m delineator
NORTH
SOUTH
0.5m
2.5m Sidewalk
1.5m - 2.0m Cycle track
4.0m - 4.5m Bus landing
3.5m Lane
3.5m Lane
3.25m Lane
1.3m
3.35m Turning Lane
3.25m Lane
3.5m Lane
3.5m Lane
4.0m - 4.5m Bus landing
1.5m - 2.0m Cycle track
2.5m Sidewalk
0.5m
22.8m (Existing ROW)
44.0m (Proposed ROW)


Montreal Road - East of Elwood
(Looking East)
Official Plan ROW Protection Limits
Proposed Property Line
Existing Property Line
0.2m delineator
0.5m delineator
0.2m delineator
Official Plan ROW Protection Limits / Proposed Property Lines
Parking Lot
NORTH
SOUTH
Parking Lot
0.5m
2.5m Sidewalk
1.5m - 2.0m Cycle track
3.0m Boulevard
3.5m Lane
3.25m Lane
3.5m Lane
1.5m Median
3.25m Lane
3.5m Lane
4.0m Bus landing
1.5m - 2.0m Cycle track
2.5m Sidewalk
0.5m
34.0m (Existing ROW)
35.5m (Proposed ROW)



In some locations, the EA study includes an interim design to minimize property disruption in the near future and reduce project costs. For example, the existing building in the south-east corner of the Montreal Road and St. Laurent Boulevard intersection is impacted by this project in the ultimate design, but the building can remain in place until the property redevelops, at which time the City would acquire all of the required ROW.

6.2.2 Montreal Station Bus Loop

The new bus loop will be located in the Northeast corner of the St. Joseph Boulevard and OR 174 interchange. The site shown on **Figure 6-3** is entirely on City-owned land and is not within the NCC Greenbelt. It is an optimal location given it is just east of Montreal Station, has effective access/egress opportunity for buses and no additional property is required for implementation.

Figure 6-3 Recommended Location for Bus Loop

The bus loop will require the following modifications on St. Joseph Boulevard:

- New eastbound left turn lane to assist buses with accessing the bus loop;
- Shorter westbound right turn lane to OR 174 on-ramp to reduce conflicts between turning buses and westbound traffic; and,
- New cycle track and sidewalk on the north side, adjacent to the bus loop.

This design will tie in with the planned cycling connectivity improvements along St. Joseph Boulevard, between Montreal Station and Bearbrook Road, to be constructed as part of the Stage 2 O-Train project.

The bus loop will be designed to retain flexibility to accommodate the potential for further development of the site which may include development that incorporates the bus loop into its design and of air rights over the bus loop itself. A shared access for buses and future development will likely be needed given existing roadway geometry and related site constraints.

6.3 Blair Road

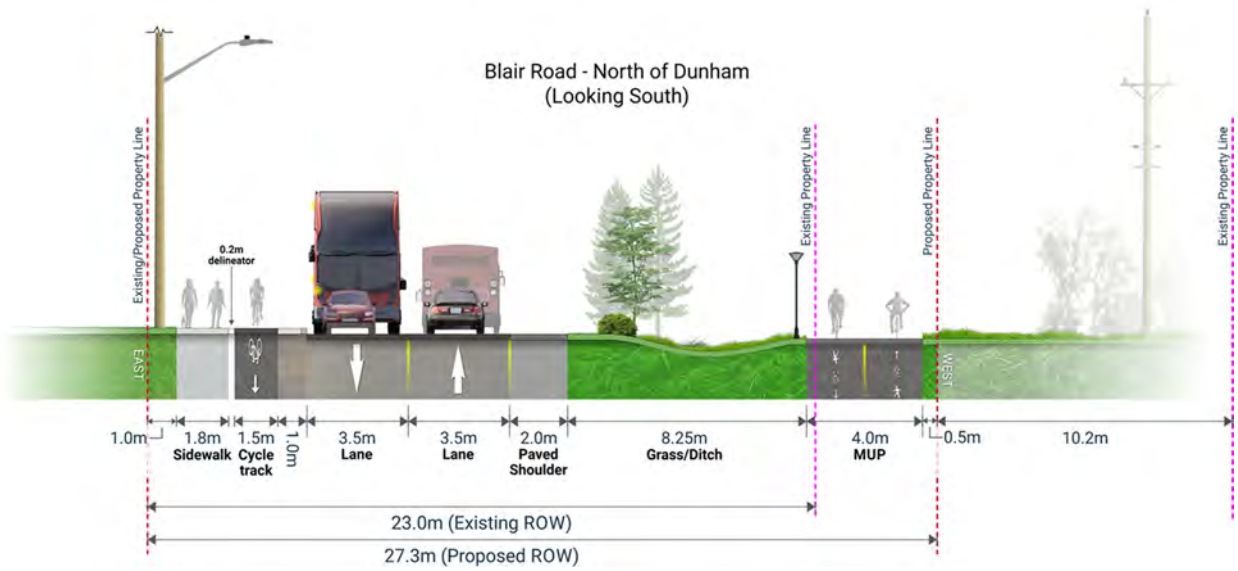
For Blair Road between Montreal Road and Blair Station, the recommended plan incorporates isolated transit priority measures and improvements to active transportation in the corridor. Key elements of the recommended plan are:

- Dedicated northbound left-turn lane for buses at the intersection of Blair Road and Montreal Road;
- Improved bus stops, boulevard and amenity spaces throughout the corridor;
- New 1.5-metre northbound cycle track and an improved 1.8-metre sidewalk on the east side of the road;
- A new 4.0-metre multi-use pathway (MUP) and an improved vegetated drainage ditch along the west side of the road;
- Protected intersections and accessible design elements, such as improved passenger loading areas, tactile walking surface indicators, unobstructed sidewalks and smooth ground and floor surfaces, and resting areas;
- At Claver Street, a new signalized intersection to help pedestrians access bus stops and the multi-use pathway from the residential community and employment centres;
- At the Blair and Ogilvie Road intersection, the protected intersection design as well as additional through and turn lanes for capacity improvements; and,
- At Blair Station entrance, a protected intersection design and removal of the southbound right turn channel.

The cycle track, sidewalk and multi-use pathway will significantly improve connectivity to Montreal Road, Ogilvie Road and Blair Station, as well as to the adjacent residential communities, employment centers and commercial uses. To accommodate the new active transportation facilities and other improvements, the existing Blair Road ROW will be utilized more fully. The corridor will need to be widened primarily along the west side of Blair Road, where the use of Hydro One lands will be required to accommodate the new multi-use pathway. The City acknowledges the Hydro One's objective that the MUP not be located closer than approximately 7m from hydro poles. This objective will be pursued at subsequent design phases through a combination of realigning the pathway and narrowing the pathway if needed where adjacent to pole locations. The City is committed to involving Hydro One in the decision making at the preliminary and detailed design phases. Additional requirements and expectations from Hydro One are included in Table 6-2.

Figure 6-4 shows a representative cross-section for Blair Road between Montreal Road and Ogilvie Road, looking south. For most of this section, the roadway will remain two lanes (one in each direction), with turn lanes provided at intersections.

Figure 6-4 Recommended Cross-Section for Blair Road north of Ogilvie Road



The protected ROW could accommodate a cycle track and sidewalk instead of the MUP if that is required at project implementation.

The EA study did not identify a need for road modifications for transit priority on Blair Road north of Montreal Road. Existing roadways, including those within the NRC campus, and new links proposed in the Former Canadian Forces Base (CFB) Rockcliffe Community Design Plan and Wateridge Village Subdivision Plans, can be used for future transit and active transportation links.

6.4 Corridor Landscaping and Space Programming Strategy

6.4.1 Public Realm and Placemaking Improvements

Along the Montreal Road and Blair Road corridors, the recommended plan provides opportunities for new placemaking and public realm improvements. These spaces will provide for visually interesting and people-friendly areas such as urban nodes and neighbourhood gateways, pathway connections and seating and rest areas. The areas would include tree planting, shade and landscaping. Also included in the urban placemaking will be wayfinding signage, distinctive surfaces, benches, pedestrian lighting, low maintenance landscaping/shade trees, and public art.

The EA Study Team presented the draft functional design to the City's Urban Design Review Panel (UDRP). Comments received from the panel were used to inform the functional design and will be used to inform the subsequent preliminary and detailed design phases for the project. The UDRP comments are included in **Appendix B**.

6.5 Corridor Drainage and Stormwater Management

Stormwater management for the Study Area, or, "corridor" is serviced by underground storm sewer systems with the exception being Blair Road, between Montreal Road and Ogilvie Road where the west side of the roadway sheet drains to roadside ditches.

Stormwater management design for the sections of the corridor within Cyrville Drain and Green's Creek subwatersheds is to be determined during detailed design whereby a runoff control volume target and detailed LID measurements will be considered that permit targets to be reached. The remainder of the corridor has been considered and stormwater management for each section described below.

6.5.1 Section 1 – Montreal Road - from St. Laurent Boulevard to Bridge above MacCallum Street

This section of Montreal Road is located within Ottawa East Core 1 and Ottawa East Core 2 subwatersheds. It is serviced by underground storm sewer systems. A number of catch basins will be relocated to accommodate the Recommended Plan. These modifications will generate an increased peak flow that may be accommodated by the existing storm sewer systems. This is to be determined during the detailed design phase. Should the pre-redevelopment peak flow be maintained, storage solutions will have to be designed during the detailed design phase.

6.5.2 Section 2 – Montreal Road - from Bridge over MacCallum Street to Shefford Road

This section of Montreal Road is located within Cyrville Drain and Green's Creek subwatersheds. It is serviced by underground storm sewer systems. A number of catch basins will be relocated to accommodate the Recommended Plan. These modifications will generate an increase in impervious surfaces. The existing pre-development water balance is to be maintained using LID measures. These measures will be determined during the detailed design phase.

6.5.3 Section 3 – Montreal Road – Shefford Road to 160m east of Shefford Road

This section of Montreal Road is located within Green's Creek subwatershed. It is serviced by underground storm sewer systems. A number of catch basins will be relocated to accommodate the Recommended Plan. These modifications will generate an increase in impervious surfaces. The existing pre-development water balance is to be maintained using LID measures. These measures will be determined during the detailed design phase.

Note that the stormwater management design east of this location is designed by others as part of the Stage 2 LRT Project.

6.5.4 Section 4 – Blair Road - Montreal Road to Ogilvie Road

This section of Blair Road is located within Cyrville Drain and Green's Creek subwatersheds. On the west side of the road runoff sheet drains to a roadside ditch. The east side of Blair Road is serviced by underground storm sewer systems. A number of catch basins will be relocated to accommodate the Recommended Plan. These modifications will generate an increase in impervious surfaces. The existing pre-development water balance is to be maintained using LID measures. These measures will be determined during the detailed design phase.

6.5.5 Section 5 – Blair Road – Ogilvie Road to 210 m south of Ogilvie Road

In this section, Blair Road is located within Cyrville Drain subwatershed. It is serviced by underground storm sewer systems. A number of catch basins will be relocated to accommodate the Recommended Plan. These modifications will generate an increase in impervious surfaces. The existing pre-development water balance is to be maintained using LID measures. These measures will be determined during the detailed design phase.

Note that the stormwater management design south of this location is designed by others and is to be considered during detailed design.

6.5.6 Section 6 – Bus Loop

The Bus Loop area is located in a Greenfield area within City-owned land, adjacent to the NCC's Greenbelt within the Green's Creek subwatershed.

About 70% of the Bus Loop runoff surface drains to the east onto NCC property; 15% drains to the Highway 174 onramp ditch and the remaining 15% drains to the Montreal Road roadside ditch.

Note that the stormwater management design west of this location is designed by Stage 2 LRT, coordination is required as the design progresses.

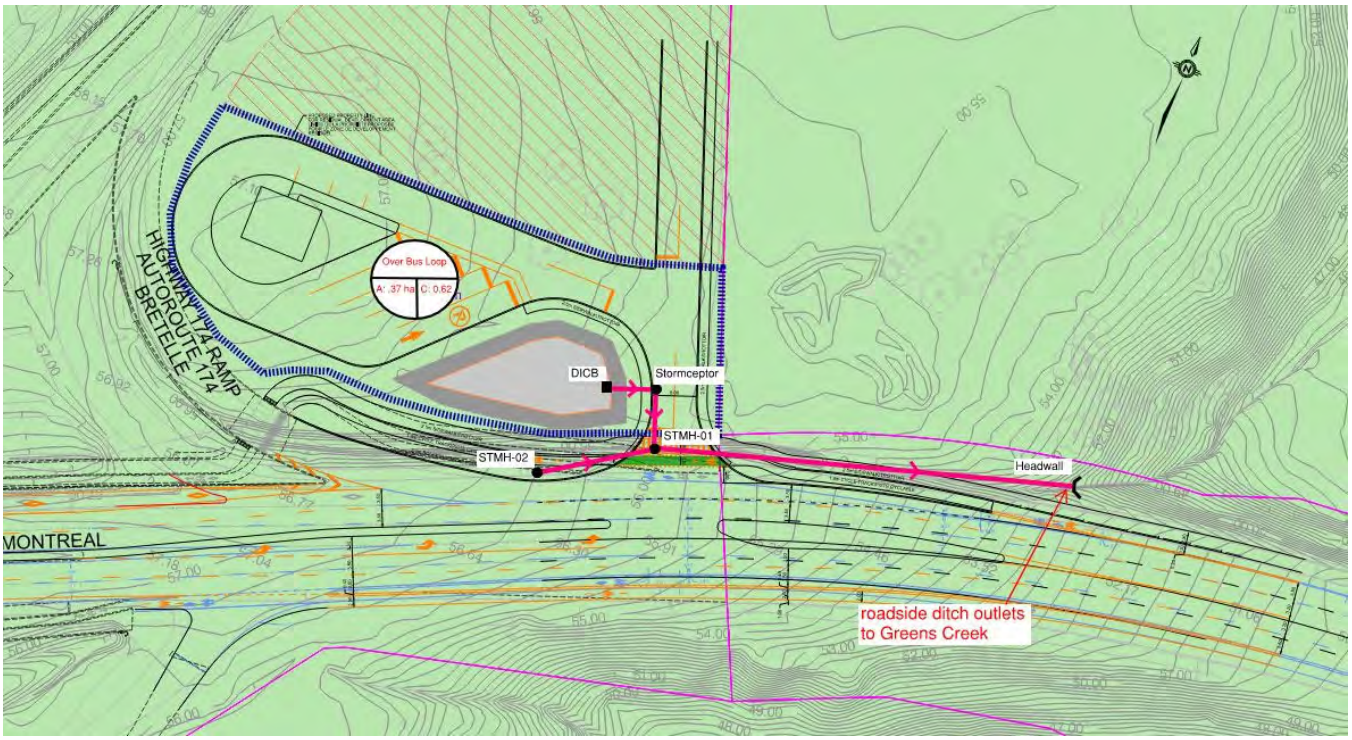
The proposed Bus Loop will generate an increase in impervious surfaces. The peak flow exiting the site is to be controlled to its 5-year pre-development rate. The excess volume, up to 100-year storm, is to be detained on site in a detention pond. The pond will outlet to an oil/grit separator and then discharge to the new storm sewer on Montreal Road. The storm sewer system conveying the runoff from the pond to the new storm sewer is shown in **Figure 6-5**.

The existing pre-development water balance is to be maintained by the use of at-source (lot level) control LID measures such as bioretention, permeable pavement, swales, soakaway, infiltration chambers, perforated pipe systems, green roofs, rainwater harvesting and landscape alternatives. There are application constraints for the above measures such as the bedrock elevation, groundwater level, permeability of subsoil and soil contamination. The preferred LID measures and stormwater management plan to be determined at detailed design phase, as is the sizing and geometry of the pond. Further, there is opportunity to share the outlet pipe and headwall with nearby works. The stormceptor could also be shared if capacity allows, or separate stormceptors could drain into a shared outlet pipe. Potential sharing of infrastructure with Stage 2 LRT works to be determined during detailed design phase.

The runoff quality control is to be at an enhanced level of protection. This is to be achieved using at-source LID measures, and an oil/grit separator (Stormceptor).

A permit from RVCA will be required for the storm sewer installation within RVCA regulation limits at Green's Creek.

Figure 6-5 Montreal Road and Bus Loop Storm Sewers



6.6 Description of Project Activities

6.6.1 Preconstruction Phase

A key requirement of the pre-construction phase will be the acquisition by the City of the required right-of-way within the project limits. The specific requirements are illustrated on the Recommended Plan (**Section 7.0**). The City will employ its approved process of contacting landowners and working with them towards acquisition, using the standard methods of the Real Property Acquisition Policy that are available to the City.

This phase includes the completion of preliminary and detailed engineering and landscape designs and preparation of contract drawings and specifications. The phase also involves obtaining all necessary permits as well as approvals from regulatory agencies. Future consideration during the design phase should include but not be limited to:

- Confirming existing conditions through detailed survey;
- Confirmation of project geometry;
- Confirmation of approach to project procurement;
- Determination of intersection designs;
- Determination of transit stops;

- Detailed Stormwater management design;
- Landscape materials and tree planting details;
- Confirmation of measurement of cross section elements;
- Lighting design, frequency and location of light poles;
- Traffic plant design;
- Bus loop design;
- Bus operators' building design, including stormwater, sanitary sewer and watermain design requirements for the building;
- Strategy for management of impacted materials (if applicable);
- Obtaining approvals for construction access and working areas;
- Identification of all existing utilities in the area and preparing utility reconstruction/relocation plans;
- Detailed construction staging and phasing plans;
- Coordination with other projects in the vicinity of the corridor; and
- Development of all mitigation plans and strategies.

6.6.2 Construction Phase

This phase involves activities related to construction. Physical construction activities for the transit priority elements, lane reallocation and conversion to complete street cross section including but not limited to:

- Installation of construction fencing and required protection measures for trees, wildlife and sediment / erosion control;
- Clearing and grubbing of trees or any vegetation within the grading limits for construction of the project;
- Stripping of topsoil within the grading limits;
- Construction of bus loop site and associated building;
- Excavation of road surface;
- Removal of existing asphalt, re-use where possible and disposal at an approved facility;
- Management of impacted materials (if applicable);
- Relocation of utility and piped underground infrastructure;
- Pouring concrete curbs;
- Laying granular and application of hot mix asphalt;
- Applying pavement markings and installing traffic signs;
- Installation of storm catch basins and storm sewers as well as ditch drainage and other stormwater management features;
- Implementation of traffic management measures. The work will be sequenced and timed to minimize impacts on the transportation network (vehicles and transit), cycling routes, pedestrian pathways and adjacent local roads and access to adjacent businesses and residences; Special attention must be paid to specific access needs of the Montfort Hospital and numerous long term care homes and retirement residences in the Montreal Road corridor.
- Installing landscaping features, and public realm enhancements; and
- Restoration and rehabilitation of any disturbed areas extending beyond the project limits.

6.6.3 Operational Phase

This phase begins with the first day of corridor operation and covers the general operational activities such as maintenance and monitoring on an as-required basis. Once construction is complete, monitoring of the project, as it will be completed in phases, will be initiated as part of the normal City practices. In addition, warranty reviews (such as landscape health) will be completed.

Corridor Maintenance

Maintenance activities in accordance with current City standards will include:

- Spring sweeping of the roads and pathways;
- Maintenance of transit stops;
- General maintenance to ensure public safety (changing lights, security checkups);

- Ditch cleanouts;
- Snow and ice removal in winter;
- Winter maintenance will include snow clearance and salting/sanding pedestrian areas as well as cycling routes that are part of the winter-maintained network;
- Landscaping maintenance including grass cutting, tree pruning (optimally in Fall or Winter); and
- Replacement of any landscape materials.

6.6.4 Project Phasing and Prioritization

The Montreal Road and Blair Road transit priority corridors could be implemented in sections, such as:

- Montreal Road from St. Laurent Boulevard to Blair Road.
- Montreal Road and Shefford Road intersection. The queue jump lanes, protected intersection and other active transportation improvements would improve transit and active transportation connectivity to Montreal Station.
- Bus Loop at Montreal Station. This facility would ideally be in operation at the opening of the O-Train Line 1 East LRT extension.
- Blair Road from Montreal Road to Blair Station.

Phasing will be dependent on funding availability, critical travel demand, future development and intensification, opportunities to coordinate with such development, asset renewal needs and Council priorities.

6.6.5 Construction Staging

Primary tasks associated with construction of the project have been identified above. The varying conditions along the corridor will require that several different construction methods be used to complete the project. Temporary staging areas will be required at multiple locations to support stockpiling of materials and equipment needed to construct the project in an efficient manner.

The contractor selected by the City will be responsible for developing construction plans and designs which meet contractual requirements, which includes defining the means and methods of construction. Reasonable efforts that can be made to limit disruption to the existing road network and transit service should be considered.

6.7 Built-in Mitigation Measures

For this project, “built-in mitigation” is defined as actions and design features incorporated in the pre-construction, construction, and operational phases, which have the specific objective of lessening the significance or severity of environmental effects which may be caused by the project. They include standard construction practices and BMPs.

The Project will be designed and implemented with the benefit of contemporary planning, engineering, and environmental management practices. Regard shall be had for the legislation, policies, regulations, guidelines, and best practices of the day. Where possible, mitigation measures will be prescribed in the construction contracts and specifications. Examples of practices that should be employed, based on current standards, are described below. These measures can be considered “built into” the preferred design for the project. They will be updated and refined during the pre-construction, construction, and operation phases of the project, as early as possible.

6.7.1 Erosion and Sediment Control Plan

A detailed plan will be prepared by the Contractor, to manage and mitigate the flow of sediment into storm sewers resulting from project construction including excavation. This plan will include preventative measures (e.g. covering excavated soils) to deter opportunistic species such as Bank Swallow from nesting on stockpiled materials within construction areas. The plan shall include drawings, standard notes and reports depicting and describing the site conditions (e.g. grades, locations of natural features, soil stockpiles) during a particular phase of construction and based on BMPs. Individual ESC plans should be generated for each phase of construction to manage and mitigate the flow of sediment into storm sewers resulting from project construction. This plan may include the following twelve (12) elements:

- Preserve existing vegetation and mark clearing limits
- Establish construction access

- Control flow rates
- Installed sediment controls specific to the site topography
- Stabilize soils
- Protect slopes
- Protect drain inlets
- Stabilize channels and outlets
- Control pollutants
- Control de-watering
- Maintain best management practices

6.7.2 Environmental Protection Plan

It will be the responsibility of the contractor to ensure that no contamination, waste or other substances which may be detrimental to aquatic life or water quality, will enter a watercourse as either a direct or indirect result of construction or site preparation. In this regard, any floating debris resulting from construction which accumulates on watercourse banks is to be immediately cleaned up and disposed of. Any spills or contamination, waste or other substances which may be detrimental to aquatic life or water quality will also be immediately cleaned up.

Any work which will cause or be the cause of discharge to watercourses is to be prohibited. At all times, construction activities are to be controlled in a manner that will prevent entry of deleterious materials to watercourses. In particular, construction materials, excess materials, construction debris and empty containers are to be stored away from watercourses, the banks of watercourses and steep slopes.

6.7.3 Air Quality, Noise and Vibration

A detailed air quality, noise and vibration assessment was conducted for the Recommended Plan. The full report can be found in Error! Reference source not found.. Analysis found noise levels throughout the Study Area are dominated by area road traffic. Existing ambient noise levels in some sections of the Study Area are more than 60 dBA as detailed in the Air Quality, Noise & Vibration Assessment (**Appendix B**). In some locations, implementation of the project will marginally increase noise levels above existing conditions. The project will include provision for retrofitting existing areas with noise attenuation measures.

Should there be changes in guidelines and best management practices in the future, further noise analysis may be required at detailed design. If future residential developments are proposed within proximity to the project, the requirement for noise attenuation measures will be evaluated at that time and any necessary mitigation will be included as a condition of development approval.

Varied construction activities throughout the corridor are expected to create isolated and short-term noise, air quality and vibration impacts on the environment. The construction manager will be required to develop a strategy for mitigating the effects according to BMPs intended to satisfy, as feasible, the fugitive dust limits specified in O. Reg. 419, the noise limits specified in MECP NPC-115 and NPC-118 and City of Ottawa By-laws for Noise; and MECP NPC -119 and NPC-207 for ground vibrations or the regulating standards of the time. A list of common mitigation strategies adapted to the current project includes, but is not limited to, the following:

Air emissions BMPs:

- Monitor wind conditions, and plan operations to take advantage of calm wind periods;
- Minimize site storage of granular material in height and extent;
- Locate storage piles in sheltered areas that can be covered;
- Provide movable wind breaks;
- Use water spray and suppression techniques to control fugitive dust; and
- Cover haul trucks and keep access routes to the construction site clean of debris.

Noise and vibration BMPs:

- Limit speeds of heavy vehicles within and approaching the site;
- Provide compacted smooth surfaces, avoiding abrupt steps and ditches;

- Install movable noise barriers or temporary enclosures, around blast sites for instance;
- Keep equipment properly maintained and functioning as intended by the manufacturer; and
- If required, implement a blast design program prepared by a blast design engineer.

6.7.4 Emergency Response Plan

The preparation of an Emergency Response Plan to be used by the contractor will be needed to allow full emergency service access at all times during the construction period, such that there is a method to access all residential, commercial and other land uses in the event of an emergency. Additionally, the Emergency Response Plan should include provisions for providing temporary services to end users in the event of a construction related service outage or other service disruption.

6.7.5 Spills Response and Reporting Plan

A Spills Response and Reporting Plan will be prepared and adhered to by the contractor. A response plan is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and include keeping emergency spill kits on site (and in heavy machinery) in case of emergency.

The Contractor must also ensure that:

- Materials such as paint, primers, rust solvents, degreasers, grout, poured concrete or other chemicals do not enter the storm sewers or nearby watercourses.
- Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.

All spills shall be reported to the Ministry of Environment (MOE) Spills Action Centre (1-800-268-6060). Management of Contaminated Materials.

Studies will be completed to confirm the potential for the project to interact with contaminated soil or groundwater, where existing conditions are not known. Where the potential has been confirmed, a plan to remediate the environment to the applicable standards will be prepared. The MECP and Construction Project Manager would be notified immediately upon discovery of any contaminated material encountered within the construction area. If contaminated material or contaminated groundwater is encountered within the construction limits, these are to be removed and disposed of in accordance with all applicable Acts and Regulations and reported to applicable authorities. Treatment and discharge of contaminated groundwater are to also be in accordance with applicable legislation and regulations.

6.7.6 Lighting Treatment Plan

A Lighting Plan in accordance with City of Ottawa standards (City of Ottawa, 2016) will be prepared as part of the detailed design. The Lighting Plan will include lighting fixtures and illumination along the corridor. For areas adjacent and within NCC lands, consultation with the NCC to develop context sensitive lighting will be undertaken with the goal of encouraging the reduction or elimination of unnecessary lighting along transportation routes and at facilities in the Greenbelt to help achieve a night sky quality, without compromising safety. Lighting will be designed with consideration for impacts to wildlife such as through the use of side shields to reduce backlighting in the Greenbelt or the use of luminaires with low backlighting characteristics.

6.7.7 Construction Waste Management Plan

During construction there will be some excess materials that will require disposal off the project site. These could include concrete rubble, asphalt, waste steel/metal structural components, earth, and road right-of-way appurtenances such as signs, lighting and utility poles. During the detailed design stage, a Construction Waste Management Plan will be developed to ensure that surplus material is recycled wherever practical and to describe the methods to be used by the Contractor for disposal of all other surplus material in accordance with provincial or local municipal practices and guidelines. MECP's guideline *Management of Excess Soil – A Guide for Best Management Practices* (MOECC, 2014) should be referenced once this management plan is being prepared.

6.7.8 Archaeological Resources

During the course of construction, if unexpected archaeological resources are discovered, the site should be protected from further disturbance until a licensed archaeologist has completed the assessment and any necessary mitigation has been completed. Applicable authorities should be notified according to the guidelines and land ownership at the time.

6.8 Site Specific Mitigation Measures

Once potential effects were predicted as part of this EA study, mitigation measures were identified. Often these mitigation measures were sufficient to reduce potential negative effects to an insignificant or negligible status. Mitigation included environment rehabilitation and replacement. Localized site-specific mitigation measures are summarized below.

6.8.1 Property Assessment and Acquisition Process

The EA study resulted in a Class C cost estimate for project implementation that followed the City of Ottawa's Project Delivery Review and Cost Estimating procedure. These costs, as well as costs associated with acquiring property and property rights on which to build or provide construction easements for the construction of the project, will need to be updated prior to project implementation. These will include, in addition to actual property value, the cost of right-of-way preparation, legal and appraisal services and land survey.

6.8.2 Public Communications Plan

The requirement for a Public Communications Plan stems from the need to keep the public informed about the work in progress and the end result of the construction activities. Businesses, institutions, residents, tenants and other stakeholders including transit service providers and emergency service providers must be aware of scheduled road closings and other disruptions to normal service ahead of time in order that their activities can be planned with minimum disruption. The Public Communications Plan will follow the standard established by the City including detail on how to communicate the information to the public, information to be disseminated, and at what project stage the communication should take place.

6.8.3 Archaeological Assessment

Areas within and adjacent to the corridor identified as having archaeological potential will be subject to subsequent (Stage 2/3/4) Archaeological Assessment prior to construction should these lands be required to be disturbed through implementation of the Recommended Plan. Subsequent stages of archaeological assessment should be completed as early as possible in the detailed design phase as the results may impact design details and schedules. Indigenous Communities will be involved as required based on best practices and governing municipal, provincial and federal legislation and policies.

6.8.4 Construction and Traffic Management Plan

A Construction and Traffic Management Plan will be developed to manage the transportation function for all travel modes including equipment and material deliveries at various times during the construction period. The objective will be to maintain clear walking routes and to maintain as much functionality for traffic as possible. The plan will also outline the road signage program.

6.8.4.1 Traffic and Transit Diversions during Construction

During project construction, traffic diversions will need to be implemented to permit construction work to occur on various project elements. The duration and extent of traffic diversions will vary from location to location and include lane closures and temporary detours. Complete closure of existing roadways is not anticipated based on the current level of design.

During the detailed design phase, the final detour plans will be closely coordinated with construction staging. Routes for any diversions will be determined in consultation with the City of Ottawa and the contractor completing the works and be communicated to the public in advance of implementation (e.g. through consultation or mobility management plans).

6.8.5 Corridor Drainage and Stormwater Management Plan

The purpose of developing and implementing stormwater management strategies is to provide adequate systems for the Recommended Plan. The purpose of the Corridor Drainage and Stormwater Management Plan is two-fold; it identifies the rate and volume of anticipated stormwater runoff and the means to accommodate it, and the means of achieving Ministry guidelines for water quality of stormwater runoff.

This includes the identification, in the detailed design phase, of the overall stormwater management system requirements, methods of retention, detention and infiltration, and any control mechanisms necessary to achieve runoff quantity and quality targets, while continuing to provide the required flows to downstream areas. Drainage systems and their components are sized and designed in conjunction with the overall project, and retention or detention systems are then incorporated into the design to achieve Ministry guidelines for runoff quantity and quality control. When prepared during the detailed design phase, this plan will consider the opportunity to treat stormwater runoff within the identified right-of-way prior to further off-site (i.e., outside the right-of-way) treatment following those measures outlined in the Corridor Drainage and Stormwater Management Approach outlined in this ESR (Section 6.5).

Surface drainage will generally be via catch basins to a closed storm sewer system. Catchbasin relocations will be required throughout the corridor to accommodate the proposed changes. New catchbasins are also expected to be required in areas of pavement widening, to accommodate the increased runoff from the increased impervious area. Curb inlet catchbasins will be strongly preferred for both relocations and new catchbasins to avoid having surface inlets in the wheel path of buses. The placement of new and relocated catchbasins will need to be coordinated with existing utilities to minimize conflicts. Where conflicts are not avoidable, utility relocations may be required and would have to be coordinated with applicable utilities in accordance with the terms of the agreements in place.

The west side of Blair Road south of Montreal Road features a rural cross-section and ditch. This configuration will be maintained for the length of Blair, with the exception of limited lengths on the approaches to Montreal Road and Ogilvie Road where the west side curb will be elongated to accommodate the planned improvements to these intersections.

The NCC have requested to continue to be consulted on matters related to stormwater management particularly in relation to the bus loop. In addition to the above, they have the following comments to be addressed during the next phases of the project:

The NCC is strongly in favour of using lot level stormwater controls to match the existing conditions water budget on site from the proposed development. We encourage the designers to consider all applicable measures and innovative approaches to overcome any applicable constraints "constraints for the above measures such as the bedrock elevation, groundwater level, permeability of subsoil and soil contamination".

Regarding the potential to share an outlet with the adjacent LRT works: make sure to consider the receiving channel and assess the capacity from the outlet of the proposed works to Green's Creek. While the overall SWM requirements (control to 5-year pre-development) should prevent any flood risk on Green's Creek, the potential for erosion in the immediate receiving channel must be considered.

6.8.6 Geotechnical Investigations

A detailed geotechnical and hydrogeological program should be completed during detailed design to advise on groundwater and subsurface conditions and potential impacts that will need to be considered in the detailed design of the project including review of potential impacts to groundwater wells found in the Fairhaven Community. Geotechnical investigations will confirm specific construction methodologies, techniques, mitigation measures, contingency plans and processes in consideration of subsurface findings. Phase Two Environmental Site Assessment

A Phase One ESA was completed to assist with the evaluation of alternatives and potential impacts that will need to be further considered in the detailed design of this project. The Phase One ESA identified several areas that have some level of risk for contamination. Additional ESA work (e.g. Phase Two ESA) may be required to assess the soil and groundwater quality associated with these areas and to assist in the planning and scoping of the construction phase of the project with regard to the cost and approach to the management of materials (soil and/or groundwater during construction).

6.8.7 Landscape Plan

A detailed Landscape Plan will be prepared to guide the species selection, location and planting details for all proposed plantings and other streetscape elements within the corridor. The plan will be prepared by a professional landscape architect. The Landscape Plan will generally be in-keeping with the Corridor Landscape Approach outlined in **Section 6.4** of this ESR.

6.8.8 Ecological Site Assessment

Various potential natural heritage features were identified in the Study Area under present day conditions. An Ecological Site Assessment should be carried out during detailed design and prior to construction to more thoroughly determine the presence, extent or provide an update of natural heritage features including: SAR, and habitat suitable for SAR, Significant Wildlife Habitat, wildland fire risk, significant woodlands and headwater drainage features located along the Recommended Plan corridor. Protection afforded to any identified species shall be in accordance with appropriate provincial and federal jurisdiction.

Breeding bird surveys are recommended as per the Marsh Monitoring program which will also help to identify presence of SAR birds. As per the MECP, a set of at least 3 breeding bird surveys to assess should be conducted between the last week of May and the first week of July and separated by a week or more from previous surveys.

The SAR in Ontario List (O.Reg. 230/08 under the ESA, 2007) is updated periodically to add newly listed species or revise species status. Prior to construction, the list should be reviewed and an update of the potential species present and their associated habitat should be completed. A SAR determination should be included in an Ecological Site Assessment for any affected areas. If a SAR is observed during the works within the construction zone, the MECP is to be immediately contacted and operations modified to avoid any negative impacts to the species or their habitat until they leave the area, or until further direction is provided by the MECP. If necessary, permits and/or authorizations will be obtained under the ESA.

A Wildland Fire Risk Assessment as per Wildland Fire Risk Assessment and Mitigation Reference Manual (MNRF, 2017) should be conducted to determine potential risk of wildland fire. The Tree Conservation Report will also assist with the completion of this report.

6.8.9 Tree Conservation Report

The purpose of the Tree Conservation Report is to retain as much natural vegetation as possible, including mature trees, stands of trees, and hedgerows. The Tree Conservation Report will identify and describe the vegetative cover on the site prior to construction and will provide a professional opinion as to the priority that should be given to the conservation of the treed areas that are beyond the grading limit. This report will also provide an assessment of trees identified for removal. Additional surveys to mark distinctive mature trees may be required. The City's Tree Protection By-law establishes minimum standards for tree protection, as well as compensation requirements for trees authorized for removal. For trees within other publicly owned lands, federal and provincial property owners should be consulted as their criteria and methodology for tree conservation reports differ from the City of Ottawa's.

Together the Landscape Plan and the Tree Conservation Report will help ensure that trees will be retained where feasible and that new trees will be planted to contribute to the City's forest cover target and to address net tree loss of a project site and the tree protection measures required. The Tree Conservation Report will be prepared during detailed design prior to construction and in accordance with the City of Ottawa Guidelines.

6.8.10 Construction Timing Considerations

All activities related to construction should avoid certain timing windows dependent on the wildlife that is present. Following SAR review and more in-depth surveys conducted prior to detailed design, there may be additional timing restrictions in addition to those listed below to protect sensitive species and/or habitats.

6.8.10.1 Breeding Birds

In order to remain in compliance with the *Migratory Bird Convention Act*, 1994 and *Fish and Wildlife Conservation Act*, 1997, it is recommended that any vegetation removal that may be required take place outside of the breeding bird season for this region (April 1st to August 31st).

In most cases nest searches during the nesting season (April 1st to August 31st) are not recommended within complex habitats, which may occur along the project corridor, as the ability to detect nests is low while the risk of disturbance to active nests is high. Disturbance increases the risk of nest predation and abandonment by adults. Therefore, nest searches are not recommended unless nests are known to be easy to locate without disturbing them. Nests searches may be completed during the nesting period (April 1st to August 31st) by a qualified biologist within 'simple habitats' (Canadian Wildlife Service, 2014). Simple habitats refer to habitats that contain few likely nesting spots or a small community of migratory birds.

Examples of simple habitats include the following:

- an urban park consisting mostly of lawns with a few isolated trees;
- a vacant lot with few possible nest sites;
- a previously cleared area where there is a lag between clearing and construction activities (and where ground nesters may have been attracted to nest in cleared areas or in stockpiles of soil, for instance); or
- a structure such as a bridge, a beacon, a tower or a building (often chosen as a nesting spot by robins, swallows, phoebes, Common Nighthawks, gulls and others)" (Canadian Wildlife Service, 2014)

Similarly, nest searches can also be considered when investigating the following:

- "conspicuous nest structures (such as nests of Great Blue Herons, Bank Swallows, Chimney Swifts);
- cavity nesters in snags (such as woodpeckers, goldeneyes, nuthatches); or
- colonial-breeding species that can often be located from a distance (such as a colony of terns or gulls)" (CWS 2014).

6.8.10.2 Turtles

Turtles are actively nesting in June and early July and may be attracted to existing road shoulders or to construction zones with areas of exposed soils or stockpiles of fill. Caution should be taken during the active season (April 1 – October 30) of any given year by thoroughly sweeping the area before works begin to help encourage any turtles within the area to move away. Exclusion fencing will be installed to prevent turtle access to the work area where appropriate (e.g., near water or wetlands). Additional consultation with the MECP may also provide species-specific mitigation, if required.

6.9 Assessment of the Recommended Plan

6.9.1 Assessment Methodology

The preliminary impact analysis of alternatives went only so far as to be able to determine which alternative was preferred for the Study Area; if the resulting effects for a particular criterion were the same for each alternative, or no residual effects were predicted, the results were not used to compare alternatives. This section describes the comprehensive analysis/assessment of all the identified impacts of implementing the preferred solution.

The values and conditions identified in the documentation of existing conditions were used as the basis for assessing the effects of the Recommended Plan on the transportation, social, physical and biological environments. The impact analysis involved applying the steps, as presented in **Table 6-1**.

Table 6-1 Impact Assessment Approach

STEP 1	Identify and analyze activities where the project, as detailed in Section 6.0 interact with existing environmental conditions as detailed in Section 3.0.
STEP 2	Acknowledge predetermined project activities that act as *built-in mitigation* measures as well as *site specific mitigation measures.*
STEP 3	Identify the *residual* environmental effects, if any.
STEP 4	Identify opportunities for further *mitigation of residual* effects, if possible/practical including monitoring.
STEP 5	Determine the *significance* of the residual environmental effects, after further mitigation.

As described in the methodology, an environmental effect assessment requires consideration of the interaction of the project (i.e. project activities) with the environment. Pre-construction, construction and operational activities as described above were all assessed.

Professional judgement and experience formed the basis for identifying environmental effects and mitigation measures. The analysis was based primarily on comparing the existing environment with the anticipated future environment, during and after construction. Consideration was given to:

- the magnitude, spatial extent, and duration of effects;
- the proportion of a species population or the number of people affected;
- direct or indirect effects; and
- the degree to which the effect responds to mitigation.

In this assessment, "residual" environmental effects are defined as changes to the environment caused by the project, and vice versa, when compared to existing conditions and taking into account all mitigation measures. Potential residual environmental effects are assessed as to their significance, including spatial and temporal considerations, and are categorized according to the following definitions:

"Positive" means an effect that exhibits a beneficial outcome.

"Negligible" means an effect that may exhibit one or more of the following characteristics:

- nearly-zero or hardly discernible effect; or
- affecting a population or a specific group of individuals at a localized area and/or over a short period.

"Insignificant" means an effect that may exhibit one or more of the following characteristics:

- not widespread;
- temporary or short-term duration (i.e., only during construction phase);
- recurring effect lasting for short periods of time during or after project implementation;
- affecting a specific group of individuals in a population or community at a localized area or over a short period; or
- not permanent, so that after the stimulus (i.e., project activity) is removed, the integrity of the environmental component would be resumed.

"Significant" means an effect that may exhibit one or more of the following characteristics:

Widespread:

- permanent transcendence or contravention of legislation, standards, or environmental guidelines or objectives;
- permanent reduction in species diversity or population of a species;
- permanent alteration to groundwater flow direction or available groundwater quantity and quality;
- permanent loss of critical/productive habitat;
- permanent loss of important community archaeological/heritage resources; or
- permanent alteration to community characteristics or services, or established land use patterns, which is severe and undesirable to the community as a whole.

Study boundaries serve to focus the scope of the assessment such that a meaningful analysis of potential impacts arising from the proposed project can be made. Project boundaries are defined by the spatial and temporal limits of the proposed project activities, and their zones of influence.

Once the potential effects were predicted, additional mitigation measures were identified. Often these mitigation measures were sufficient to reduce negative effects to an insignificant or negligible status.

Monitoring is important to verify the accuracy of effects predictions. Monitoring measures were recommended to determine what effects actually occurred with project implementation and may result in the modification of mitigation measures to improve their effectiveness.

6.9.2 Assessment Results

Table 6-2 describes the potential effects, mitigation, residual effects and their significance, and monitoring recommendations for the Recommended Plan. Note that in the "Location" column, "Throughout Corridor" refers to the Montreal Road corridor, Blair Road corridor and the bus loop.

Project phases are identified as follows: P - Pre-construction/Design; **C** - Construction; **O** - Operation

Table 6-2 Impact Assessment Results

Environmental Value	Project Activity	Project Phase			Location	Analysis of Potential Environmental Effect	Mitigation Measures Built-In Mitigation Measures	Potential Residual Effect	Level of Significance after Mitigation	Monitoring Recommendation
		P	C	O						
Social Environment										
Planning Policies	Pre-construction planning and design; Project Implementation.	•			Throughout corridor	The project has been developed in accordance with relevant provincial, federal and municipal guiding documents which may be updated from time-to-time.	Review of changes to policies and guidelines.	None anticipated.	Positive	None required.
Zoning	Pre-construction planning and design; Project Implementation.	•			Bus loop location	Facilities that support the Rapid Transit Network are permitted in all zones. The Bus Loop location is currently within an Environmental Protection Zone.	Zoning review to determine requirement of rezoning of the site. This may be included as part of a comprehensive review of the Zoning By-law in support of a new Official Plan.	None anticipated.	Positive	None Required.
Indigenous Land Claims	Pre-construction planning and design; Project Implementation.	•			Throughout corridor	A large portion of northeastern Ontario is subject to an unresolved land claim with the Algonquins. The Agreement-in-Principle (2016) does not identify any lands within the Study Area as subject to these consultations.	Continued engagement and consultation with Indigenous Communities in subsequent project phases.	None anticipated.	Negligible	None required.
Property Requirements	Acquire temporary access to public and private properties to undertake pre-construction surveys and studies.	•			Throughout corridor	Permission to enter onto private and public property will be required prior to construction to obtain/update additional information on: topographical mapping, geotechnical conditions, environmental conditions, and the natural environment to assist in detailed design and inform permitting/approval requirements.	Consent to Enter Agreements and permissions as required prior to undertaking work. *Public Communications Plan.* Coordinate investigation schedule with affected property owners to minimize disturbance.	Temporary inconvenience to property owners during surveys and studies.	Insignificant	As per *Public Communications Plan* and any requirements negotiated through Consent to Enter Agreements.
Property Requirements	Acquire necessary properties for the project.	•			Throughout corridor	The project requires permanent property acquisitions from federal, private and public landowners as well as potential easements.	Acquire property as per City of Ottawa Real Property Acquisition policy and according to future land transfers and land leases. Cost, cost-sharing and requirement for compensation to be determined in negotiation with affected landowners. As per *Property Assessment and Acquisition Process.*	None anticipated.	Insignificant	As per *Property Assessment and Acquisition Process.*
Property Requirements	Acquire necessary properties and easements for the project.	•			Throughout corridor	Permanent and temporary Federal property requirements will require Federal Land Use approvals.	Early consultation and coordination with NCC and any other applicable Federal agencies at the time of project pre-planning. Property Assessment and Acquisition Process to acquire property as per City of Ottawa policy and according to future land transfers and land leases. Requirement for compensation to be determined in negotiation with affected landowners. Completion of a FLUDTA as set out in Sections 12 and 12.1 of the National Capital Act. Completion of requirements consistent with the *Impact Assessment Act* of Canada.	None anticipated.	Insignificant	As per *Property Assessment and Acquisition Process* and consultation with NCC and federal landowners.
Landscape and Visual Environment	Pre-construction planning and design; detailed design for roadway and associated landscape design.	•		•	Throughout corridor	Enhanced landscaping and public realm elements will improve visual environment for the corridor.	*Landscape Plan* to be completed during detailed design in consideration of landscaping strategy as outlined in Section 6.4 and in consultation with adjacent landowners.	Temporary disruptions to the existing views. *Landscape Plan* should result in an overall improvement to existing landscape and views.	Positive	As per *Landscape Plan.*
Landscape and Visual Environment	Pre-construction planning and design; detailed design for roadway and associated landscape design.	•			Intersection of Montreal Road and Aviation Parkway	The project has the potential to impact scenic values of the Aviation Parkway.	*Landscape Plan* and in consultation with NCC. The NCC has requested that the City continue to consult with the NCC to ensure a high quality of design and seamless transition from Capital Pathway to the municipal street can be ensured.	None anticipated.	Negligible	As per consultation with NCC and *Landscape Plan.*

Environmental Value	Project Activity	Project Phase			Location	Analysis of Potential Environmental Effect	Mitigation Measures Built-In Mitigation Measures	Potential Residual Effect	Level of Significance after Mitigation	Monitoring Recommendation
		P	C	O						
Archaeological Resources	Pre-construction planning and design; project construction, grading and excavation for all associated infrastructure.	•	•		Areas identified as having archaeological potential.	Construction in undisturbed areas identified as having archaeological potential may disturb intact archaeological resources.	For City/Provincial lands: Conduct subsequent *Archaeological Assessment* (Stage 2, 3, 4) in identified areas in conformance with MHSTCI Standards and Guidelines for Consultant Archaeologists (2011). Archaeological Assessment must be undertaken by a licensed archaeologist. These subsequent assessments should be completed as early as possible in the detailed design process so that study recommendations can be incorporated into the project details. These reports will be circulated to MHSTCI and interested Indigenous Communities. If archaeological resources are accidentally uncovered during construction activities, the site should be protected from further disturbances until a licensed archaeologist has completed an assessment. For Federal NCC lands: Conduct subsequent *Archaeological Assessment* (Stage 2, 3, 4) in identified areas as required following direction of NCC Archaeologist. If any artefacts of Indigenous interest are encountered contact: Algonquins of Ontario Consultation Office, 31 Riverside Drive, Suite 101. Pembroke, Ontario K8A 8R6. Tel: 613-735-3759 Fax: 613-735-6307 E-mail: algonquins@tanakiwin.com	None anticipated.	Insignificant	Additional work, if needed, as per *Archaeological Assessment* recommendations.
Archaeological Resources and Cultural Heritage Resources (including Built Heritage Resources and Cultural Heritage Landscapes)	Pre-construction planning and design.	•			Notre-Dame Cemetery at 435-455 Montreal Road.	Potential for impacts to and loss of heritage character/undiscovered archaeological remains.	Any alteration of potential heritage attributes, such as the fencing, will require a property-specific Heritage Impact Assessment during detailed design. Below-grade work within 20 metres of the cemetery property boundary will require construction monitoring by a licenced professional archaeologist in accordance with Sections 2.1.7 and 3.3.3 and 4.2.3 of the MHSTCI Standards and Guidelines for Consultant Archaeologists (2011). Reporting related to the construction monitoring will be circulated to the MHSTCI and interested Indigenous Communities. No project activities will be undertaken within the cemetery property boundaries. If cemetery lands are required for the project, requirements under the Funeral, Burial and Cremation Services Act will be met. In the event that project activities are required to be undertaken within the cemetery property, a property-specific Stage 1 Archaeological Assessment will be prepared. This report will be circulated to the MHSTCI and interested Indigenous Communities.	None anticipated.	Negligible	As per *Archaeological Assessments* recommendations.
Cultural Heritage Resources (including Built Heritage Resources and Cultural Heritage Landscapes)	Pre-construction planning and design; construction of roadway, grading and excavation for all associated infrastructure.	•	•		Identified Cultural Heritage Resources: CHR-6 NRC Campus; CHR-7 741 Blair Road and CHR-8 Blair Road.	Potential for impacts from construction vibrations on the identified CHRs.	Pre -construction consultations between the City and owners. Pre-construction measurements of background vibration levels. Pre-condition survey by means of a photographic record of potentially affected structure façades and all surfaces, including visible sections of building foundations, building cladding, doors, windows, interior wall finishes, surface pavement, sidewalks, signs and trees. Each of the elements should be rated on their general condition (new, good, fair, poor, severe) and visible defects will be photographed.	None anticipated.	Insignificant	As per pre and post construction condition assessment.
Cultural Heritage Resources (including Built Heritage Resources and Cultural Heritage Landscapes)	Pre-construction planning and design; construction of roadway, grading and excavation for all associated infrastructure.	•	•		Intersection of Montreal Road and Aviation Parkway	Project has the potential to impact cultural heritage landscape scenic values of the Aviation Parkway.	A project-specific Heritage Impact Assessment and continued consultation with the NCC during the next phases of the project.	None anticipated.	Insignificant	As per Heritage Impact Assessment and consultation with the NCC.
Cultural Heritage Resources (including Built Heritage Resources and Cultural Heritage Landscapes)	Pre-construction planning and design; construction of roadway, grading and excavation for all associated infrastructure.	•	•		Monument de la francophonie d'Ottawa at Montfort Hospital	The project is not anticipated to impact the monument.	Should the design extend to impact the monument, re-evaluation of potential impact in consultation with he Montfort Hospital should be completed.	None anticipated.	Insignificant	None required.

Environmental Value	Project Activity	Project Phase			Location	Analysis of Potential Environmental Effect	Mitigation Measures Built-In Mitigation Measures	Potential Residual Effect	Level of Significance after Mitigation	Monitoring Recommendation
		P	C	O						
Air quality	Construction of roadway, grading and excavation for all associated infrastructure.		•		Throughout corridor	Dust and equipment exhausts will diminish air quality during the construction period.	As per *Public Communications Plan* to inform residents of planned construction works. Contractor to implement air quality BMPs and will be responsible for implementing a mitigation strategy with the intent on satisfying the requirements for Ontario Regulation 419. These can include: • Dust suppressants to be applied as warranted. • Haul routes and nearby streets to be cleaned as per existing municipal standards. • Minimize site storage of granular material in height and context. • Locate storage piles in sheltered areas where feasible. • Provide moveable windbreaks where feasible. • Equipment to be kept in good working order and to not unnecessarily idle.	Dust may be an irritant to adjacent residents, business owners and pedestrians.	Insignificant	As per *Public Communications Plan.*
Air quality	Project operation.			•	Throughout corridor	Products of combustion are anticipated to fall below the MECP's Ambient Air Quality Criteria (AAQC). Over time, pollutant concentrations are expected to improve with vehicle environmental controls and newer engine technologies including conversion of current bus fleet to electric vehicles.	None required.	Pollutant concentrations predicted below AAQC and overall improvement.	Positive	None required.
Noise	Construction of roadway, grading and excavation for all associated infrastructure.		•		Throughout corridor	Noise levels produced by stationary and moving construction equipment will be occasionally disruptive to adjacent landowners and residents.	As per *Public Communications Plan* to inform residents of planned construction works. Contractor to adhere to the City By-laws (2017-255). Noise BMPs may include: • Keeping equipment well maintained, moving parts lubricated and restricting unnecessary idling. • Compliance with MECP NPC-115 and NPC-118. • Contractor to have construction noise complaint process detailed, and action plan to address noise related complaints where warranted.	Temporary increase in noise from construction.	Insignificant	As per *Public Communications Plan.* Monitor complaints during construction.
Noise	Project operation.			•	Identified existing sensitive receivers along road corridor.	Noise analysis completed concluded that the project will result in minimal changes to noise throughout the corridor and noise levels fall below the City's Environmental Noise Control Guideline for provision of mitigation measures. Some existing properties where noise levels currently exceed 60dBA in outdoor living areas fronting on or flanking the corridor.	Design and implementation of noise attenuation at existing properties where noise level exceed current thresholds as per guidance provided in the City's Environmental Noise Control Guidelines (that may be updated from time-to-time) to be included as part of this project. If the residents and landowners desire to implement the noise barriers before the project is implemented, that can be investigated under the City's Local Improvements policy and guidelines.	Reduced noise levels from corridor.	Positive	None required.
Vibration	Construction of roadway, grading and excavation for all associated infrastructure.		•		Throughout corridor	Construction activities near residential and business uses may cause noticeable vibrations.	As per *Public Communications Plan* to inform residents of planned construction works. Vibration BMPs to be implemented by contractor. Compliance with MECP NPC-119 and NPC-207. Construction vibration complaint process is detailed with an action plan to address vibration-related complaints where warranted.	Temporary vibrations from construction activities may be noticeable.	Insignificant	As per *Public Communications Plan.* Monitor complaints during construction.
Vibration	Project operation.			•	Throughout corridor	Predicted future vibration level conditions are anticipated below perceptible thresholds.	None required.	Vibration levels below recommended perceptible threshold.	Negligible	None required.
Stormwater Management	Operation of stormwater management infrastructure.			•	Throughout corridor	Increase of impervious surface areas to accommodate new design (including that for pedestrians and cyclists and at intersections) and increase in need to accommodate stormwater including during high storm events.	A *Corridor Drainage and Stormwater Management Plan* and requirements of Environmental Compliance Approval (ECA).	New SWM infrastructure.	Insignificant	Maintenance requirements as per ECA and City policy.
Stormwater Management	Pre-construction planning and design; Construction of the roadway and operation of new stormwater management system for the roadway.	•	•	•	Throughout corridor	*Corridor Drainage and Stormwater Management Plan* to identify overall system requirements, methods of retention, detention, and infiltration and any control methods necessary to achieve runoff quality and quantity targets. Project construction may cause temporary disruption to services.	*Corridor Drainage and Stormwater Management Plan.*	Improved/new SWM infrastructure. Temporary service disruptions.	Insignificant	*As per Corridor Drainage and Stormwater Management Plan.*

Environmental Value	Project Activity	Project Phase			Location	Analysis of Potential Environmental Effect	Mitigation Measures Built-In Mitigation Measures	Potential Residual Effect	Level of Significance after Mitigation	Monitoring Recommendation
		P	C	O						
Business Establishments	Pre-construction planning and design; construction of roadway, grading and excavation for all associated infrastructure.	•	•		Throughout corridor	Possibility for some road detours and temporary closures during construction.	BMPs during detailed design phase and *Public Communications Plan*, Construction and *Traffic Management Plan* to keep residents, businesses, employees and employers up to date.	Potential for some temporary reduction in revenue for some businesses.	Insignificant	As per *Public Communications Plan*. Monitor complaints during construction.
Pedestrian and Cycling Network	Construction of roadway, grading and excavation for all associated infrastructure.		•		Throughout corridor	Construction may result in detours for pedestrians and cyclists for road and pathway crossings.	Key pedestrian and cycling routes should be maintained. Accessibility Design Standards (City of Ottawa, 2015) or newer must be applied. Contractor to implement a *Construction and Traffic Management Plan* to minimize the effects on traffic flow and to ensure roadway safety for all users. A *Public Communications Plan* should be developed in consultation with OC Transpo to inform residents of construction schedule and changes. Construction fencing to demarcate the work area for safety.	Temporary inconvenience to pedestrians and cyclists.	Insignificant	As per *Public Communications Plan* and Construction and *Traffic Management Plans* including *Transit Operations*. Monitor complaints during construction.
Pedestrian and Cycling Network	Operation of pedestrian and cycling infrastructure.			•	Throughout Corridor	Improved multi-modal connections throughout the corridor and with the LRT Stations on the Trillium Line. Increased active transportation modal split due to higher order pedestrian and cyclist facilities. Improved safety through implementation of Crime Prevention Through Environmental Design (CPTED) review.	Review of design following Crime Prevention Through Environmental Design (CPTED) principles/guidelines. BMPs during detailed design phase. Regard for contemporary pathway design and protected intersection design. Accessibility Design Standards will be applied. A *Landscape Plan* will be implemented to include pedestrian and cycling amenities.	Pedestrians and cyclists will be provided a safer, multi-modal, more accessible transportation environment.	Positive	None required.
Transit Network Connectivity	Pre-construction planning and design; Project Implementation.			•	Throughout corridor.	The project will provide an enhanced level of service and access to Ottawa's LRT network.	None required.	None anticipated.	Positive	None required.
Transit Network	Project operation.			•	Throughout corridor	Modifications to the corridor will improve general traffic efficiencies. Transit network will be improved both with respect to higher order facilities, accessibility and efficiencies. Design to enable more efficient routes and flexibility for local bus service and improved safety features through contemporary design.	Design standards to be reviewed at time of detailed design. Where efficiencies or improvements can be made to road design, BMPs of the time to be incorporated.	Increased transit ridership and improved transit travel time. Improved local and regional traffic movements.	Positive	None required.
Road Network: Emergency Detour Route (EDR)	Pre-construction planning and design. Construction of roadway, grading and excavation for all associated infrastructure.	•	•		Montreal Road	Montreal Road is identified as an EDR for the OR 174. If the EDR is needed during construction this could cause delays/disruptions for emergency access. There are design considerations given that it is an EDR.	Design and construction timing/phasing should consider the designation. Consultation with relevant City of Ottawa staff and provincial agencies. *Public Communications Plan* *Emergency Response Plan.*	None	Insignificant	As per *Public Communications Plan* and *Emergency Response Plan.*
Road Network: Pedestrian Crossings	Pre-construction planning and design.	•			Montreal Road	Some comments received during public consultation recommended additional pedestrian crossings be considered in some sections of Montreal Road (between Codd's/Carsons and Bathgate/Burma, and between Lang's/Den Haag and Codd's/Carsons) to reduce the spacing between existing signalized intersections.	A pedestrian signal review to determine the need for additional pedestrian crossings should be undertaken based on the existing conditions at the time of detailed design. In addition, the City of Ottawa regularly assesses the need for additional signalized crossings, where warranted and can advance implementation outside of this EA study.	None	None	As per Pedestrian Signal Review.
Road and Transit Network	Construction of roadway, grading and excavation for all associated infrastructure.		•		Throughout Corridor	Construction will require modifications to transit operations and result in some disruptions to traffic.	A *Public Communications Plan* should be developed to inform residents and businesses of construction schedule and changes. Special attention should be paid to the needs of the fire station, the Montfort Hospital and numerous retirement residences and long-term care homes in the corridor. A public notification program should be implemented by the City and OC Transpo for any temporarily detoured transit routes/stops. *Traffic Management Plan including Transit Operations* in consultation with OC Transpo (for Transit modifications). Contractor to ensure road safety for all corridor users. *Emergency Response Plan.*	Increased traffic on alternate routes during construction. Possible delays in travel time in peak hours during construction. Possible isolated delays in emergency response.	Insignificant	As per *Public Communications Plan* and *Construction and Traffic Management Plans including Transit Operations*. Monitor complaints during construction.

Environmental Value	Project Activity	Project Phase			Location	Analysis of Potential Environmental Effect	Mitigation Measures Built-In Mitigation Measures	Potential Residual Effect	Level of Significance after Mitigation	Monitoring Recommendation
		P	C	O						
Utilities	Construction of roadway, new infrastructure installation and decommissioning of some existing services.		•		Throughout corridor	Existing utilities (gas main, hydro poles and ducts, telecommunication) will need adjustment/relocations to accommodate new road cross-section. Potential disruptions to services during construction.	Construction to be coordinated with utility companies to minimize impact and reduce duplication in construction activities. Utility locates completed prior to excavations. *Emergency Response Plan.*	Potential for short-term and/or unintentional service disruptions.	Insignificant	Monitor complaints during construction.
Utilities Hydro One	Pre-construction planning and design; construction of pedestrian and cycling infrastructure.	•	•		West side of Blair Road corridor where the new multi-use pathway (MUP) will be constructed	Pedestrian/Cycling facility in the form of a Multi-Use Pathway, or as confirmed through detailed design, to be located within Hydro One Corridor in proximity to existing hydro infrastructure. The project is not anticipated to result in a Hydro One station expansion or transmission line replacement and/or relocation and therefore, a Class Environmental Assessment for Minor Transmission Facilities (Hydro One, 2016) will not be required.	Hydro One has submitted the following comments to the City of Ottawa for consideration during detailed design: • Any changes to lot grading or drainage within, or in proximity to Hydro One transmission corridor lands must be controlled and directed away from the transmission corridor. Install post and paddle fence along both sides of the MUP where it comes within 10 m of the structure. Fence to be constructed from non-conductive material. • Install high voltage signage in areas within 10 m of the structure. All sign posts have to be constructed with non-conductive material (e.g. wood). • That the City of Ottawa acknowledge that Hydro One will require the closure of the MUP when maintenance of the line is required. This is required to establish a safe work zone for Hydro One crews. In cases where there is storm damage, Hydro One may need to install temporary structures which are smaller and require anchors. In those cases, the MUP closure may last longer than normal. • Depending on the circumstances, the fence required (as specified above) may need to be removed by Hydro One repair crews. The City will need to reinstate the fence within a reasonable time after repairs are completed. • The City of Ottawa should contact Hydro One by sending an email to: secondarylanduse@hydroone.com to discuss subsequent design phase and project implementation. • The project will require for the City of Ottawa to submit a Property Management Proposal (PMP) for Hydro One to fully assess the impact to Hydro One assets.	None anticipated.	None.	As per Hydro One guidance.
Climate Change: Extreme weather events	Pre-construction planning and design.	•			Throughout corridor	Increasing variability in temperature extremes. Increasing frequency of high-intensity and duration of weather extremes (i.e. wet weather, dry periods, wind storms). Increase in maximum daily precipitation and annual precipitation. Faster and earlier thawing and risk of flooding. Increase in freeze-thaw conditions.	Use of the latest available design guidelines and standards and incorporate climate resiliency and risk assessment goals. *Corridor Drainage and Stormwater Management Plan* to consider accommodation of flash storm events and regard for Wet Weather Infrastructure Management Plan or best practices at the time of construction. *Landscape Plan* to include mitigating use of trees for moderating temperatures and providing wind break where possible.	Potential for short-term flooding. Disruptions to corridor for additional maintenance, as required.	Insignificant	As per *Corridor Drainage and Stormwater Management Plan* and *Landscape Plan.*
Climate Change: Corridor user safety and comfort	Pre-construction planning and design.	•			Throughout corridor	Increased risk to public safety for corridor users during extreme storm events. Reduced corridor user comfort during periods of extreme temperature and extreme weather events (precipitation, heat days, wind)	*Landscape Plan* to consider possible mitigating effects to improve corridor user comfort through landscaping design and of additional sheltering elements. Corridor to include adequate rest areas. Corridor Stormwater Management Plan.	Temporary discomfort to corridor user. Reduction in use of sustainable transportation modes.	Insignificant	As per *Landscape Plan* and *Stormwater Management Plan.*
Climate Change: Waste Management	Pre-construction planning and design. Construction of roadway, grading and excavation for all associated infrastructure.	•	•		Throughout corridor	Construction of the project has the potential to produce a large amount of construction related waste.	Design to consider opportunities to employ waste-reduction methods, where possible. Contractor to develop *Waste Management Plan* to the extent possible, reuse material on-site prior to the consideration for new materials or shipment off-site.	Generation of excess waste materials for disposal off-site.	Insignificant	As per *Waste Management Plan.*
Climate Change: Extreme weather events	Facility operation			•	Throughout corridor	Increased frequency of high intensity and duration of wind and storm events may result in greater frequency of disruptions to service (i.e. temporary closure for maintenance, loss of power at traffic signals).	City to follow *Emergency Response Plan* policies and procedures. Maintenance plan to consider reducing risks to infrastructure.	Temporary disruptions to corridor function during and immediately following extreme weather events.	Insignificant	As per *Emergency Response Plan.*

Environmental Value	Project Activity	Project Phase			Location	Analysis of Potential Environmental Effect	Mitigation Measures Built-In Mitigation Measures	Potential Residual Effect	Level of Significance after Mitigation	Monitoring Recommendation
		P	C	O						
Climate Change: Extreme snow and ice events	Facility operation.			•	Throughout corridor	Increased frequency and duration of extreme snow and ice events may increase risk to corridor users (i.e. pedestrians and cyclists). Increased requirement for application of de-icing agents.	City to consider pre-application techniques to prevent ice build-up and requirement for further applications as per City operating policies and processes and best practices at the time of operation.	Iced surfaces may result in accidents to corridor users.	Insignificant	As per City policies and procedures.
Biological Environment										
Vegetation	Pre-construction planning and design.	•	•		Throughout corridor	Clearing and grubbing activities will remove/alter existing corridor vegetation. The majority of vegetation in the corridor is planted and/or ornamental in nature. Loss of terrestrial vegetation due to construction activities may cause fragmentation of habitats and corridors. Accidental spills to the terrestrial environment.	*Ecological Site Assessment* prior to construction to identify existing wildlife corridors and habitats. Protection of identified features and individual specimens with exclusion fencing. *Tree Conservation Report and Landscape Plan.* Minimize vegetation clearing to the extent possible. Replacements to be with native varieties and/or salt tolerant species as appropriate. *Spills Response and Reporting Plan.* *Erosion and Sediment Control Plan* to be implemented prior to vegetation removal. Consistent with the Urban Tree Protection Policy set out in the Capital Urban Lands Plan), the NCC encourages avoiding the removal of urban trees when redesigning the Aviation parkway / Montreal Road intersection and other federal urban lands.	Localized loss of terrestrial vegetation.	Insignificant	As per *Ecological Site Assessment, Tree Conservation Report, Landscape Plan* and *Erosion* and *Sediment Control Plan.*
Vegetation	Project operation			•	Throughout corridor	The project includes enhanced and additional corridor landscaping. Native species to be planted.	The details of landscaping will be completed and monitored (if needed) as per *Landscape Plan.* Plantings on NCC-owned lands should be in consultation with NCC.	Enhanced landscaping throughout the corridor.	Positive	As per *Landscape Plan* and in consultation with NCC and other Federal landowners with respect to their lands.
Wildlife	Pre-construction planning and design; construction of roadway, grading and excavation for all associated infrastructure.	•	•		Throughout corridor, particularly at the Aviation Parkway, Green's Creek corridor.	Impact to wildlife movement due to construction activities. Temporary localized disruption of wildlife habitat. General construction activities may disturb migratory birds or their habitat.	*Ecological Site Assessment* including targeted surveys to be conducted prior to construction as part of a Species at Risk Overview. Delineation of construction area to limit disturbance. As per the City's Protocol for Wildlife Protection during Construction Guide (2015). To reduce the possibility of contravention of the MBCA, vegetation removal should be scheduled to occur outside of the overall bird nesting season of April 1 to August 31. If a nest of a migratory bird is found within the active construction area at any time, vegetation removal and construction activities must cease until the young have fledged from the nest and the area is cleared by a qualified Biologist. If vegetation must be removed during the overall bird nesting season nest sweeps must be completed prior to works and cleared by a qualified Biologist. Caution should be taken during the turtle nesting season in June and early July as turtles use embankments and other terrestrial sites for nesting. During the active season MNRF recommends a thorough sweep of the area before works begin to encourage any turtles using the site to move away and the use of exclusion fencing as a best management practice. Fencing must be installed in the spring, prior to the turtle nesting season, be maintained throughout works, and checked on a daily basis.	Minor short-term localized avoidance of the area by migratory birds and transient wildlife.	Insignificant	As per City's *Protocol for Wildlife Protection during Construction* Guide, and *Ecological Site Assessment.* Daily sweeps of the construction areas.
Wildlife	Project operation			•	Throughout corridor.	Wildlife collisions with project infrastructure.	Follow City of Ottawa guidelines for bird-safe design. The draft guidelines are drafted in compliance with the CSA A460:19.	Accidental avian injury/mortality.	Insignificant	As per *City of Ottawa guidelines for bird-safe design*
Wildlife	Project operation			•	Throughout corridor particularly at the Aviation Parkway, Green's Creek corridor.	New illumination throughout the corridor may influence wildlife circadian rhythms.	*Ecological Site Assessment* work to understand wildlife populations and specific mitigation to reduce illumination effects. *Lighting Treatment Plan* based on contemporary BMPs and research. Best practices through design to ensure a balance of maintaining road safety (from wildlife collisions) while not over-illuminating adjacent natural areas.	Change to wildlife behaviour.	Insignificant	As per *Ecological Site Assessment and Lighting Treatment Plan.*

Environmental Value	Project Activity	Project Phase			Location	Analysis of Potential Environmental Effect	Mitigation Measures Built-In Mitigation Measures	Potential Residual Effect	Level of Significance after Mitigation	Monitoring Recommendation
		P	C	O						
Species at Risk	Pre-construction surveys and investigations. Project Construction grading and excavation for all associated infrastructure.	•	•		Throughout corridor.	Several Species at Risk have potential to occur within the Study Area. Species at Risk habitat may be affected during construction.	Conduct an *Ecological Site Assessment* to confirm presence of SAR identified with potential to be present in the Study Area and significant habitat. Targeted surveys may be required. Protection afforded to any identified SAR or SAR habitat shall be in accordance with appropriate federal/provincial jurisdiction. Avoid habitats of identified SAR where possible during functional design. *Construction Timing Considerations* - mitigation measures outlining timing window restrictions on construction will also help protect Species at Risk. Preventative measures (e.g. covering excavated soils) should be employed to deter opportunistic species such as Bank Swallow and Common Nighthawk from nesting on stockpiled materials within construction areas. All on-site staff should undergo environmental awareness training to be able to identify the potential SAR that could be encountered. If SAR are observed during construction, the MECP is to be immediately contacted and operations modified to avoid any negative impacts to the species or their habitat until further direction is provided by the MECP. Consultation with MECP, CWS and ECCC, to identify any permits/approvals required. If necessary, permits or authorizations to be obtained under the ESA.	Potential for short-term localized disturbance to SAR.	Insignificant	*Ecological Site Assessment* and in consultation with agencies.
Physical Environment										
Geotechnical Conditions	Pre-construction surveys and investigations.	•			Throughout corridor	More detailed geotechnical and hydrogeological information is required in order to confirm engineering methods and requirements.	*Geotechnical Investigations* to be completed during detailed design to specify construction specifications.	None anticipated.	Negligible	As per detailed *Geotechnical Investigations.*
Geotechnical Considerations: Private Wells	Pre-construction investigations and excavation during construction	•	•		In proximity to Fairhaven Community (north side of Montreal Road, between Lang's Road and Codd's Road)	Excavations in karst bedrock may cause potential negative water quality impacts during construction activities.	*Geotechnical Investigation to be completed during detailed design to specify specific mitigation measures to safeguard impacts to private wells.*	Temporary decrease in water quality	Insignificant	As per detailed *Geotechnical Investigations.*
Potentially Contaminated Land	Pre-construction planning and design; project construction, grading and excavation for all associated infrastructure.	•	•		Areas of potential environmental concern (APEC) within the project construction footprint.	Construction activities may disturb subsurface contaminants in identified APECs.	Conduct a *Phase Two Environmental Site Assessment* during detailed design, as early as possible to better define APECs and assist in the planning and scoping of construction and approach to the management of materials (soil and/or groundwater) during construction.	Management and removal of contaminated materials, if required.	Insignificant	As per *Phase Two Environmental Site Assessment.*
Potentially Contaminated Land	Pre-construction planning and design; project construction, grading and excavation for all associated infrastructure.	•	•		Throughout corridor	Years of historical salt application on existing roadways may have caused shallow impacts to soil adjacent to the roadways.	Impacts should be considered if excess soils need to be excavated along existing roadways to construct roundabouts or signal intersections for example. Conduct a *Phase II Environmental Site Assessment* during the next phases of the project.	None anticipated.	Negligible	None required.

6.10 Transportation Committee and Council

The Recommended Plan and its impact assessment were presented for approval to the City of Ottawa Transportation Committee on September 1, 2021 and to Council on September 8, 2021. The staff report and supporting documents were posted on the City's website prior to the meetings.

The Transportation Committee and Council approved the functional design for the Montreal-Blair Road Transit Priority Corridor EA Study. They directed Transportation Planning staff to finalize the ESR and proceed with its posting for the 30-day public review period, in accordance with the Ontario Municipal Class EA process for Schedule C projects. The vote record and supporting documentation is provided in **Appendix A**.

6.11 30-Day Public Review Period

Following Notice of Completion, a third mandatory point of contact will occur once the final ESR is placed on the public record for a period of at least 30 calendar days.

In accordance with the provisions of the Municipal Class EA for Schedule C projects, the study results are documented in this ESR which is available for a 30-day public review period. This Notice will be posted in local newspapers accordingly, and all persons identified on the study's stakeholder list including Indigenous Communities will be notified.

If concerns regarding this project cannot be resolved in discussion with the City, a person/party may request that the Minister of the Environment, Conservation and Parks make an order to change the project status and require a higher level of assessment under an individual Environmental Assessment process (referred to as a Section 16 Order). Information on how to file a Section 16 requested can be found by accessing: https://www.ontario.ca/page/class-environmental-assessments-section-16-order

7.0 RECOMMENDED PLAN (FUNCTIONAL DESIGN)

A Functional Design illustrated on the subsequent series of plates has been prepared for the Recommended Plan. This design illustrates:

- The final roadways geometry and design including active transportation facilities and a property envelope;
- Location of the Montreal Station Bus Loop and layout; and
- Proposed areas for landscaping and environmental mitigation.

8.0 IMPLEMENTATION AND APPROVALS

The Montreal-Blair Road Transit Priority Corridor Planning and EA Study has followed the Municipal Class EA for a Schedule C Project Process. Throughout the study, the City of Ottawa worked with Public and Technical Agencies to address the environmental concerns and issues. The potential impacts, mitigation measures and the associated residual impacts were identified, evaluated, and assessed and documented in the previous sections. The future implementation, including detailed design, will need to be carried out in accordance with the recommendations in this report. This section outlines the future commitments that inform implementation of the project.

8.1 Project Costs

Detailed costing of the project has been carried out based on the Recommended Plan. Project costs were developed in accordance with the Council-approved Project Delivery Review and Cost Estimating process for implementing capital projects. The estimated cost for design, construction, property, public art, and contingencies in 2021 dollars is approximately $150 million (Class C estimate). Funding will be subject to the City's future capital budget priorities.

The study also examined how the project could be implemented in sections , as described in section 6.6.4..

8.2 Property Acquisition

The implementation of the project will require approximately 1.95 hectares in total of public lands (from NCC, CMHC, NRC, City of Ottawa) and private lands as identified on the Functional Design (Section 7.0).

8.3 Future Consultation

Consultation throughout the study was undertaken with many stakeholders. The discussions in these meetings were specific to individual property impacts and due to the functional nature of the design at the EA level, will require additional consultation at the detailed design stage.

8.4 Design Details

The project as illustrated in **Section 7.0** is designed at a functional level. Refinements to the Recommended Plan will continue in subsequent stages of design to achieve the following:

- Improve functional characteristics and detailed alignment;
- Minimize construction related impacts;
- Reduce capital and operating costs; and,
- Minimize property impacts.

The detail design team will evaluate and assess construction methods and staging prior to undertaking the project. The end result will be project documentation that includes, but not limited to the following:

Drawings

- Implementation / Staging and Detours
- Alignment
- Removals
- Grading and Drainage
- Geometry and General Layout
- Pavement Elevations
- Ditches, Culverts, Sewers and SWM facilities
- Services/Utility Relocations
- Pavement Markings
- Typical Sections
- Non-Standard Details
- Landscaping Plan
- Electrical (Illumination / Street Lighting / Stations)
- Mechanical (Stations)

- Architectural Details (Bridges, Stations)
- Structural Drawings (Bridges, Culverts, Retaining Walls, Stations)

Specifications

- Modified OPS General Conditions
- PPQ Sheets
- Special Provisions
- Special Provisions General
- Standard Drawings and Standard Specifications

Refinements to the Recommended Plan will be subject to the commitments and amending process outlined in the Municipal Class EA process.

8.5 Future Approvals

Completion of this ESR under the Ontario *Environmental Assessment Act* does not constitute approval under other legislation required to implement the project. Specific approvals will be required for many components of the project. The following is a list of customary approvals and permits that may be required and associated agencies that should be consulted.

8.5.1 Federal

8.5.1.1 Federal Land Use, Design and Transaction Approval (FLUDTA)

The Montreal-Blair Road Transit Priority Corridor project will be undertaken in part on federal lands owned and/or managed by a range of federal authorities along with the NCC. Approval from the NCC pursuant to the *National Capital Act* will be required for this project due to the requirement for NCC lands as well as other federal lands adjacent to the corridor, to accommodate the project design. To start this process, the City must submit to the NCC a Federal Land Use, Design and Transaction Approval (FLUDTA) application. Projects are evaluated in terms of their impact on Canada's Capital Region. The NCC's mandate is to ensure that land and building projects are planned and designed to standards appropriate to their significance and location. The NCC also evaluates applications based on their alignment with relevant federal plans, policies and legislation.

8.5.1.2 Impact Assessment Act

As described in Section 1.3 as federal lands are required for various phases of project completion, an Environmental Effects Analysis of all the physical activities proposed on federal lands is required, under Section 82 of the IAA. No approvals from the National Capital Commission under the *National Capital Act* can be issued before these obligations are fulfilled. An Environmental Effects Analysis of a proposed project will determine the need to eliminate or mitigate adverse effects, or to recommend monitoring based on detailed design. Section 6.9.2 details the impact assessment based on the Recommended Plan described herein. Many of the potential impacts that will also be analyzed through the federal Environmental Effects Analysis are included.

As indicated in the letter from the NCC to the City of Ottawa dated May 7, 2021, when multiple federal authorities are engaged in an Impact Assessment, the Impact Assessment Agency of Canada encourages designating one of them as the lead authority to work together in completing an analysis and producing a single IA report. The NCC will work with the City and respective federal authorities to determine which is best placed to be the lead authority.

ECCC will participate in the IAA review, at NCC's request, when the City proceeds to detailed design and FLUDTA and undertakes a Section 82 review under the IAA. ECCC would also be an Authority responsible for a Section 82 review and decision should a SARA permit be required for impacts to Endangered or Threatened SARA listed species on federal land. An assessment and mitigation of impacts to species listed as Special Concern under Schedule 1 of SARA is required as per section 79 of SARA in relation to all IAA assessment processes for this project.

8.5.1.3 Species at Risk Act

A permit may be required if the project will result in a contravention of the SARA. A permit will only be issued if the purpose of the proposed activity is for; a) scientific research relating to the conservation of the species and conducted by qualified

persons; b) the activity benefits the species or is required to enhance its chance of survival in the wild; or c) affecting the species is incidental to carry out the activity. Permit pre-conditions must also be met to ensure that all reasonable alternatives have been considered, all feasible measures will be taken to minimize impacts and the activity will not jeopardize the survival or recovery of the species.

8.5.2 Provincial

8.5.2.1 Environmental Compliance Approval

Activities regulated under the *Environmental Protection Act* (EPA), R.S.O. 1990 and the *Ontario Water Resources Act*, R.S.O. 1990 (OWRA) must be carried out in accordance with those Acts. An ECA is required for activities that fall under the EPA, Section 9 (activities that may discharge, or from which may be discharged, a contaminant into the natural environment other than water, which includes most industrial processes or modifications to industrial processes and equipment), EPA, Section 27 (Waste Management System or Waste Disposal Site), and or OWRA, Section 53 (sewage works). Due to the air quality impact and noise generated by construction activities, approvals may be necessary before construction begins.

8.5.2.2 Permit to Take Water

Water takings in Ontario are governed by the OWRA and the Water Taking Regulation (O. Reg. 387/04). Section 34 of the OWRA requires anyone taking more than a total of 50,000 litres of water in a day apply for a PTTW. This includes the taking of water for any use; whether agricultural, commercial, construction, dewatering, industrial, institutional, recreational, remediation, water supply or other purposes. Construction activities may trigger the requirement for a PTTW due to many factors including dewatering.

8.5.2.3 Ontario Endangered Species Act

The Ontario *Endangered Species Act, 2007* addresses the protection and recovery of SAR in Ontario. If a species is listed on the Species at Risk in Ontario list as an extirpated, endangered or threatened species, the Act protects the species and their habitat. The ESA 2007 includes flexibility tools that encourage good stewardship and benefit to species at risk. The Act also includes a permit process to authorize people to engage in an activity that may not otherwise be allowed under the ESA 2007. Permits may be granted under the following circumstances:

- The activity is necessary for human health and safety;
- The purpose of the activity is to help protect or recover the species at risk;
- The activity will result in an overall benefit to the species; and
- Permits may also be granted for activities that result in significant social or economic benefit to Ontario. Even in these cases, the activity must not jeopardize the survival or recovery of a species at risk.

During subsequent stages of the project, an updated species at risk assessment will determine the need for a permit. The permit application will need to include justification for any required removals as well as a mitigation/recovery plan.

8.5.2.4 Ontario Heritage Act

The *Ontario Heritage Act* gives municipalities and the provincial government powers to preserve the heritage of Ontario. Part VI of the Act deals with the conservation of resources of archaeological value. A Stage 2 Archaeological Assessment report for this project will be submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) who review archaeological reports and investigations to ensure compliance with their requirements. This should be conducted during preliminary and detailed design, prior to construction.

8.5.2.5 Conservation Authorities Act

Ontario Regulation 174/06 Development, Interference, with Wetlands and Alterations to Shorelines and Water Courses Regulation under the *Conservation Authorities Act* allows Conservation Authorities to regulate and restrict activities within floodplains, waterways, wetlands, beaches, and hazard lands. The intent of this regulation with respect to natural heritage features is to 1) prevent the destruction of natural heritage features and functions, 2) to prevent pollution of associated water systems, and 3) to promote restoration of natural heritage systems. Permits under the Regulation are authorized by conservation authorities after review of proposed works and evaluation of potential impacts and mitigation measures. Conservation authorities provide mapping that delineates areas that are subject to regulation within their respective

areas of jurisdiction or watershed. A permit to construct the project is likely required, necessary documents should be submitted to RVCA prior to construction to confirm requirements.

8.5.3 Municipal

8.5.3.1 Road Modification Approval

Where geometric modifications, or a change in the function of the existing road are required, delegated authority will be required to approve the road work on City Council's behalf in the form of a Roadway Modification Approval. An Approval Report requires: A Key Map; Context Plan; Functional Design Drawing; Turning Movement Counts; and Collision Information. Modifications covered in an environmental assessment study may not require an RMA.

8.5.3.2 Road Cut Permits

The City of Ottawa Road Activity By-law 2003-445, often referred to as the "Road Cut" By-law, was established to ensure that any road cut within the road allowance is undertaken safely, with minimal disruption, and that the reinstatement of the road cut meets City standards. A road cut is defined as: "a surface or sub-surface cut in any part of the highway made by any means, including an excavation, reconstruction, cutting, saw-cutting, overlaying, crack sealing, breaking, boring, jacking or tunneling operations".

A road cut permit is required to construct the project and should be obtained prior to undertaking any cut including road surfaces; sidewalks; and boulevards. To obtain a permit a contractor must be bonded and insured and, where the work may impact traffic or pedestrian movement, the contractor must submit for approval a Traffic Management Plan. The By-law further establishes peak hour restrictions, establishes reinstatement standards and imposes a duty on the contractor to protect City-owned trees when work is undertaken in close proximity.

8.5.3.3 Temporary Encroachment Permits

Temporary Encroachment Permits are required for construction activities that temporarily encroach onto City of Ottawa rights-of-way. Such encroachments include placement of containers, stockpiling of materials, and parking of vehicles used in the construction process including aerial, subsurface and surface types. These permits ensure that all safety measures are taken; that the construction meets the City of Ottawa standards; and, in turn, the measures ensure that area residents and passers-by are kept safe.

Examples of encroachments include:

- Aerial encroachment – generally used to facilitate the use of tower cranes. When a crane permit (aerial encroachment) is issued, securities are always checked before the permit is released;
- Sub-surface encroachment – usually used for a tie-back, rock anchor, or other type of support placed under a street or highway to support an excavation wall; and
- Surface encroachment – generally used for vehicles, materials, equipment, covered sidewalks and hoarding.

8.5.3.4 Noise By-Law Exemption

City of Ottawa By-law 2004-253 establishes the time restrictions for the operation of construction vehicles. The Contractor may apply for an exemption from the noise by-law where it is agreed that certain construction activities should take place overnight.

8.5.3.5 Tree Protection By-Law

The new Tree Protection By-Law came into effect on January 1, 2021 and harmonizes the previous Tree By-laws (Municipal Trees and Natural Areas Protection By-Law 2006-279 and Urban Tree Conservation By-Law 2009-200). The By-law applies to all City-owned trees and establishes minimum standards for tree protection, as well as compensation requirements for trees authorized for removal.

8.6 Monitoring

Monitoring is important to verify the accuracy of predicted effects. Monitoring measures may also determine what effects actually occurred with project implementation and may result in the modification of mitigation measures to improve their effectiveness. Identified monitoring plans from **Section 6.0** will be developed and reviewed by the appropriate agencies prior to implementation. Construction and post construction monitoring will be required.

In addition, any monitoring identified through the application and receipt of permits and approvals will be required.

Compliance with the mitigation measures identified in this report will be monitored by the proponent as a responsibility under the *Environmental Assessment Act*. The City of Ottawa will prepare a monitoring plan in accordance with subsection 9.2.8 of Ontario Regulation 231/08 to verify the effectiveness of the mitigation measures. The monitoring plan will be designed prior to the start of construction. It will outline responsibilities related to agency review and implementation of the monitoring report.

8.7 Modifying the Recommended Plan

This report is based on a functional design level of detail for the Montreal-Blair Road Transit Priority Corridor Planning and EA Study. The functional design forms the basis of subsequent Preliminary and Detailed Designs which will result in a project that can be implemented with design details and mitigation measures confirmed. Nonetheless, the functional design provides a sufficient level of detail to assess the environmental effects of the Recommended Plan contained within the Study Area.

It is possible that some aspects of the Recommended Plan may be subject to change as detailed designs are developed, or as environmental conditions change, following the submission of the Notice of Completion. Changes may arise in terms of Study Area conditions, new technologies or mitigation measures, new design standards or guidelines, or the identification of previously unknown information. There are potentially two categories of possible changes to the Recommended Plan which may occur during detailed design:

1. Changes that are consistent with the Recommended Plan; and
2. Changes that are inconsistent with the Recommended Plan.

An explanation of these categories of change follows in the next two sections.

8.7.1 Changes that are Consistent with the Recommended Plan

Changes to the Recommended Plan may be considered consistent with the Recommended Plan described in this ESR in that they:

- Do not fundamentally change the planned function or location of the project;
- Do not fundamentally alter identified impacts or mitigation measures;
- Do not involve landowners that have not been previously notified; and
- Do not create a need to involve previously uncirculated approval agencies.

This would include the changes to design during the detailed design process described in **Section 6.0**, as well as adjustments to property acquisition requirements described in **Section 8.2**. Should the changes to the Recommended Plan match the descriptions contained in **Section 6.0** and **Section 8.2**, or satisfy the above noted points, an addendum would not be required as the changes would be considered consistent with the Recommended Plan. In such cases, no action on behalf of the proponent is required.

8.7.2 Procedure for Addressing Changes that are Inconsistent with the Recommended Plan

Should a change be proposed that is inconsistent with the Recommended Plan contained in this ESR, at the discretion of the proponent (the City of Ottawa), an addendum may be required. The Addendum shall describe the circumstances necessitating the change, the environmental implications of the change(s) and identify mitigation measure(s) (if required). The addendum shall be filed with the ESR and *Notice of Filing of Addendum* shall be given immediately to all potentially affected members of the public and review agencies as well as those who were notified in the preparation of the original ESR. It should be made clear to review agencies and the public that when an Addendum is issued, only the items in the Addendum (i.e. the changes) are open for review. A 30-day review period following the issue of the *Notice of Filing of Addendum* shall be provided for comment. The Notice shall include the public's right to request a Section 16 Order within

the 30-day review period. If no request is received by the Minister the proponent is free to proceed with implementation. If construction has already commenced when it is determined that an addendum is required, no work shall be undertaken that will adversely affect the matter under review and shall not be reactivated until the end of the review period.

8.8 Lapse of Time

Should more than 10 years in time lapse between either of the dates noted below to the proposed commencement of construction for the project:

i. the date of filing the Notice of Completion for the ESR; or
ii. Ministerial denial of a Section 16 Order.

Then an Addendum to the ESR must be issued and a "Notice of Filing Addendum" must be completed. 10 Years is calculated as follows: beginning from the date of the Minister's or delegate's decision of any Part II Order requests or at the end of the public review period following the posting of the Notice of Completion where there is no Part II Order request.

For both circumstances, i) or ii) above, the Notice of Filing Addendum will be subject to a 30-day public review period, and if no Section 16 Order is received, the project may proceed to implementation as documented in the Environmental Study Report and associated addendum(s).

9.0 CONCLUSION REGARDING THE PROJECT

The Montreal-Blair Road Transit Priority Corridor project has the potential to change the surround environments. The purpose of this EA is to guide and predict these changes and recommend measures to minimize any negative effects and enhance or broaden the positive effects.

In this study, the existing conditions were documented, alternative solutions and designs were identified and evaluated, and a Recommended Plan of the preferred design was developed. Throughout the process, the study benefited from extensive public and agency consultation including meetings with an Agency, a Business, and a Public Consultation Group, two open houses, as well as individual stakeholder meetings. Considering the feedback received through consultation efforts, the Study Team was able to identify impacts, avoid, minimize, or mitigate potential negative impacts for the environment, users of the infrastructure, and residents and landowners immediately adjacent to the proposed project. This study process, and stakeholder involvement culminated in the City of Ottawa Transportation Committee recommendation and subsequently Council approval of the Recommended Plan.

During the construction phase, the overall corridor will be an active construction site. Traffic disruptions, noise, dust, and visual interruptions will be inevitable. Ongoing communications by the City of Ottawa with the affected public will go a long way in alleviating potential concerns and ensuring timely information about the project is shared. Following the construction phase, there will be many positive effects such as increased transit capacity and reliability, improved bus stops and amenities, and improved pedestrian and cycling facilities. The recommended improvements to transit and active transportation infrastructure will encourage increased use of sustainable modes of transportation and improve road safety. The project will also provide the opportunity to improve the visual environment though landscaping, public art, and other space programming opportunities. While the project has the potential to have effects on the human and biophysical environments as a result of the project and construction, these effects can be largely mitigated with prescribed design features, sound environmental management, and continued community engagement. Through incorporating the mitigation measures recommended by this study and those at the direction of Ottawa City Council, no significant adverse environmental effects are expected to result.

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